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THE

CYCLOPÆDIA;

OR,

Universal Dictionary

OF

ARTS, SCIENCES, AND LITERATURE.

VOL. IV.

Printed by A. Strahan,
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THE

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OF

Arts, Sciences, and Literature.

BY

ABRAHAM REES, D.D. F.R.S. F.L.S. *S. Amer. Soc.*

WITH THE ASSISTANCE OF

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ARTS and SCIENCES.

BATTERY.

BATTERY POINT, in *Geography*, lies on the north or ſtarboard ſhore of the channel of Cork, in Ireland.

BATTERY, formed of *battre, to beat or ſtrike*, in the *Military Art*, denotes an eminence caſt up, on which to plant artillery, that it may play to better advantage. It conſiſts of an epaulement, parapet, or breaſt-work, about eight feet high, and eighteen or twenty thick. The platform of a battery is laid with planks, that the wheels of the carriages may not ſink; and it is made ſloping towards the parapet, that the guns may not recoil much, and that they may be more eaſily drawn back. See *Plate* II. *Fortif. fig.* 21. *n.* 2. and *Plate* VII. *fig.* 38.

In all batteries, the open ſpaces left to put the muzzles of the great guns out at, are called *embraſures;* and the diſtances between the embraſures, *merlons*. The guns are generally from twelve to ſixteen feet diſtant from one another, that the parapet may be ſtrong, and the gunners may have room to work.

There are alſo *batteries of mortars*, the ſame with thoſe of cannon, except that they have no *embraſures;* the ſhells being fired over the parapet, commonly at an angle of 45° elevation: and the ſlope of the breaſt-work is made inwards, contrary to that of other parapets; having their platforms about ſix feet ſquare and eight feet aſunder.

The *battery* of a camp is uſually ſurrounded with a trench and palliſades at the bottom, as alſo with a parapet on the top, having as many holes as there are pieces of artillery, and two redoubts on the wings, or certain places of arms, capable of covering the troops which are appointed for their defence.

All field batteries conſiſt of four parts, *viz.* the *ditch*, the *parapet*, the *platform*, and the *magazine;* which ſee reſpectively.

The Sieur Remy, in his Memoirs of Artillery, has given a table for the ready finding of all the requiſites for the conſtruction of temporary batteries, and for their daily ſervice, the pieces being twenty-four pounders; and although theſe batteries are calculated only for ſieges, and are of the coffer-kind, yet from this table may be derived ſuch notions as will greatly help young artiſts on other occaſions.

It is alſo proper to mention the number of faſcines and pickets that is uſually expected every day from the labour of each man employed in that ſevice.

Of faſcines five or ſix feet long, and five or ſix inches thick, bound with two wyth bands each, one man will make 16 or 18 in a day, with two pickets to each.

Of faſcines eight or nine feet long by eight or nine inches thick, with two pickets to each, one man uſually makes 10 or 12 in a day.

Of faſcines 12 feet long by nine inches thick, with three pickets to each, eight or ten are uſually expected from the day's work of one man.

The days here underſtood are ſuch in which the men may work about twelve hours.

In the following table C. ſtands for hundred.

Strahan and Preſton,
New-Street Square, London.

A TABLE for the construction of Batteries.

Number of 24 pounders in battery.	Length of the parapet in yards.	Number of workmen to construct the battery.	Number of workmen's stools used at the battery, viz. shovels, spades, pickaxes, mattocks, &c.	Fascine-makers, each a bill and hatchet.	Fascines of 8 or 9 feet by 8 or 9 inches.	Fascines of 12 feet by 8 or 9 inches.	Fascines of 5 or 6 feet by 5 or 6 inches, made by the cavalry.	Pickets from 3 to 6 feet long, and about $1\frac{1}{2}$ inch thick.	Mallets to drive the pickets.	Hand-bills, 2 for each embrasure, beside spare hatchets.	Planks for the platforms, 2 or $2\frac{1}{2}$ inches thick.	Gunners to serve in battery.	Soldiers to assist the gunners.	Powder for 100 rounds, at 12lb. each per day.	Shot of 24 pounds for 100 rounds.
2	14	50	70	15	120	40	2 C	520	10	4	32	4	12	24 C	2 C
3	20	60	85	20	165	60	3 C	740	14	6	48	6	18	36 C	3 C
4	26	70	100	25	210	80	4 C	960	18	8	64	8	24	48 C	4 C
5	32	80	115	30	255	100	5 C	1180	22	10	80	10	30	60 C	5 C
6	38	90	130	35	300	120	6 C	1400	26	12	96	12	36	72 C	6 C
7	44	100	145	40	345	140	7 C	1620	30	14	112	14	42	84 C	7 C
8	50	110	160	45	390	160	8 C	1840	34	16	128	16	48	96 C	8 C
9	56	120	175	50	435	180	9 C	2060	38	18	144	18	54	108 C	9 C
10	62	130	190	55	480	200	10 C	2280	42	20	160	20	60	120 C	10 C
11	68	140	205	60	525	220	11 C	2500	46	22	176	22	66	132 C	11 C
12	74	150	220	65	570	240	12 C	2720	50	24	192	24	72	144 C	12 C
13	80	160	235	70	615	260	13 C	2940	54	26	208	26	78	156 C	13 C
14	86	170	250	75	660	280	14 C	3160	58	28	224	28	84	168 C	14 C
15	92	180	265	80	705	300	15 C	3380	62	30	240	30	90	180 C	15 C
16	98	190	280	85	750	320	16 C	3600	66	32	256	32	96	192 C	16 C

When batteries are erected at leisure, and are designed to stand for some years, they are best made of stone, or brick, or good loamy earth, as the materials may be most easily procured.

To construct the profile of a battery, let its ground line be AB (*Plate* II. *Fortif. fig.* 23. N° 2.), BD that of the parapet, the inner slope of which is formed by making D $a = 1\frac{1}{2}$ foot, and the perpendicular a H = 6 or seven feet; the crown of the parapet HI is formed by making bI a foot or two lower than a H; and the front of the battery IB is found by making bB = $\frac{2}{3}b$I when of earth, or = $\frac{1}{6}$ of bI when of masonry. If DC be made = $2\frac{1}{2}$ or 3 feet, we shall have C the fill of the embrasure, the floor of which CG is to dip a foot or two below the level line CF. The platform D E is 18 or 20 feet, the tail E rising about 6 inches above the level line AB; the lower double line represents the sleeper laid lengthwise, and the upper double line shaded with the lines across shews the ends of the planks laid on the sleepers. A gun on its carriage, with the wheels against the knocker at D, is annexed to the figure, for the purpose of aiding the apprehension. For the construction of the embrasures, merlons, ramps, &c. see the articles respectively.

Battery, *Open*, is nothing more than a number of cannon, generally field pieces, or such as carry a ball not exceeding nine pounds weight, ranged in a line or row a-breast of one another, on some small natural elevation of the ground, or an artificial bank about a yard or two high. These cannons are ranged at the distance of about 15 or 16 feet from one another; their shot and loading utensils lying by their sides, and the powder lodged in a hole at some distance behind the battery.

Battery, *Covered*, is when the cannons and gunners are covered by a bank made of brush-wood, faggots, and earth; about eighteen or twenty feet thick, and seven or eight feet high. The cannon used in such batteries are generally from nine to eighteen pounders; sometimes twenty-four pounders are used in them. See Fascine *Battery*.

Battery, *sunk* or *buried*, is that whose platform is sunk or let down into the ground, with trenches cut into the earth against the muzzles of the guns, to serve for embrasures.

This sort, which the French call *batterie en terre*, and *ruimante*, is generally used upon the first making of approaches, to beat down the parapet of the place.

Batteries, *Cross*, are two batteries at a considerable distance from each other, which play athwart one another at the same time, and upon the same point, forming right angles; so that they thus combine and produce a greater effect;

effect; because what one bullet shakes, the other beats down.

Battery *en Barbe*, *Barbet*, or *Open Battery*, is a name given to a battery, when the floor of part of it is so raised that the guns placed on it have an advantageous command over some part of the neighbourhood, and when the guns thus raised fire over the crown of the parapet without any embrasure. These barbets may be made either in a curtin, or at the saliant angle of a flanker. They should be always 2½ or 3 feet lower than the crown of the parapet, and about 8 or 9 yards broad at the top, with a proper slope to the base, of a length suitable to the number of guns to be mounted on them, allowing about five or six yards for each, and at each end have a proper ramp for ascending them. For the further illustration of their nature and construction, let P Q R V X (*Plate* III. *Fortif. fig.* 25.) be a common bank of a line, the parapet of which is R S T V; the inner slope R S being about 6 or 7 feet higher than Q R; then the bank *mno* R, raised so high that the cannon may fire over the crown of the parapet S T, is the barbet, the height of which *np* is about 3 or 4 feet. On the top of the barbet is raised a platform, as in other batteries. Let the figures 26 and 27 represent part of the plan of a line, and one of its flankers, or of a battery constructed in such a form; where A*a* is the length of the barbet, or raised battery, suited to the number of guns to be used, which are to be drawn up the ramps placed at the ends; the breadths being about 8 or 9 feet, and the length *a b* about 7 or 8 yards.

Battery, *Cavalier*. See Cavalier.

Battery *d'Enfilade*, is one which sweeps the whole length of a straight line, &c.

Battery *en Echarpe*, is that which plays obliquely.

Battery *de Revers*, or *Murdering Battery*, is one that plays on the back of any place; and being placed on an eminence, sees into it.

Battery *joint*, or *par camerade*, or *cameretta*, is when several guns play at the same time upon one place.

Battery *en Rouage*, is that used to dismount the enemy's cannon.

Battery *à Ricochet*, is adapted to the method of *ricochet* firing, first invented and practised by Vauban, at the siege of Aeth in 1692. The guns are loaded with small charges, and are elevated, so as to fire over the parapet; and the shot is hereby made to roll along the opposite rampart. This method of firing with guns has since been applied to mortars and howitzers with success.

Battery, *Coffer*, is that where the sides of the wall and merlons only are formed of fascines, and all the cavities or included spaces filled with earth.

To construct a battery of this kind, mark out with a line the limits of the parapet eighteen or twenty feet thick; and three or four feet before the parapet, mark out with lines or stakes the limits of the ditch, ten or twelve feet broad, or even more, if earth is wanted; allowing eight yards in length for one gun, and six yards more for every other gun. On the outlines of the parapet cut a trench five or six inches wide and deep, and there lay a row of fascines, the ends being jammed one into the other; and let them be staked down. Lay on them another row, so that the joinings of these may not be directly over the joinings of the lower one, and let all the knots of the bands be turned inwards; stake these down; and on them lay in like manner a third and fourth row, &c. until the height be about three feet. The same kind of work being done at the ends, and for the epaulement if wanted, the coffer for the wall will be finished. Then let the men be disposed along the place intended for the ditch, and with proper tools break the ground and throw it into the coffer; where, as the earth is thrown in, other men are to spread it, and stamp it down with rammers; and thus the coffer is to be filled. When the wall is finished, let the embrasures be staked out (see Merlon), and a coffer formed in like manner for each merlon, which is also to be filled with earth, and rammed down. Proceed to complete it in the same manner with Fascine *Battery*.

Battery, *Fascine*. See Fascine *Battery*.

Battery, *Gabion*. See Gabion.

Battery, in *Law*, denotes an act that tends to the breach of the peace of the realm, by unlawfully striking, beating, or offering other violence to another person.

Battery is frequently confounded with assault, though in law they are different offences; because, in the trespass for assault and battery, one may be found guilty of the assault, yet not convicted of the battery: there may therefore be assault without battery; but battery always implies an assault. The least touching of another's person wilfully, or in anger, is a battery; for the law cannot draw the line between different degrees of violence, and therefore totally prohibits the first and lowest stage of it: every man's person being sacred, and no other having a right to meddle with it in any the slightest manner. Upon a similar principle the Cornelian law "de injuriis" prohibited "pulsation" as well as "verberation;" distinguishing verberation accompanied with pain from pulsation without any. However, battery is in some cases justifiable or lawful; as where one who hath authority, a parent or master, gives moderate correction to his child, his scholar, or his apprentice. Thus also on the principle of self-defence, if one strikes me first, or even only assaults me, I may strike in my own defence, and if sued for it, may plead "son assault demesne," or that it was the plaintiff's own original assault that occasioned it. So likewise in defence of my goods or possession, if a man endeavours to deprive me of them, I may justify laying hands upon him to prevent him; and if he persist in violence, I may proceed to beat him away. 1 Finch. L. 203. Thus too, in the exercise of an office, as that of churchwarden or beadle, a man may lay hands upon another to turn him out of church, and prevent his disturbing the congregation. 1 Sid. 301. And if sued for this or the like battery, he may set forth the whole case, and plead that he laid hands upon him gently, "molliter manus imposuit," for this purpose. On account of these causes of justification, battery is defined to be the "unlawful" beating of another; for which the remedy is, as for assault, by action of trespass "vi et armis," in which the jury will give adequate damages. Atrocious battery is subject to trial by inspection in pursuance of the order of the court; in which case the battery must be alleged so certainly in the declaration, that it may appear to be the same with the battery inspected. In the case of a person's beating the servant of another, besides the remedy of an action of battery or imprisonment, which the servant himself may have against the aggressor, the master also, as a recompence for his immediate loss, may maintain an action of trespass, "vi et armis," in which he must allege and prove the special damage he has sustained by the beating of his servant, "per quod servitium amisit;" and then the jury will make him a proportionable pecuniary satisfaction. A similar practice obtained among the Athenians; with whom masters were entitled to an action against such as beat or ill-treated their servants. A person guilty of battery against a clergyman, is liable to three kinds of prosecution for the same offence; an indictment for the breach of the king's peace, a civil action for damages, and a suit in the ecclesiastical court; first, "pro correctione et salute animæ" by *enjoining* penance, and then

again for ſuch ſum of money as ſhall be agreed on for *taking off* the penance enjoined; it being uſual in theſe courts to exchange their ſpiritual cenſures for a round compenſation in money (2 Roll. Rep. 384.); perhaps, ſays judge Blackſtone, becauſe poverty is generally eſteemed by the moraliſts the beſt medicine "pro ſalute animæ." Bl. Com. vol. iii. and vol. iv.

Battery is ſometimes uſed in ſpeaking of the fabric of metalline utenſils. In this ſenſe, battery-works include pots, ſaucepans, kettles, and the like veſſels, which, though caſt at firſt, are to be afterwards hammered or beaten into form.

Some make battery for the kitchen, *batterie de cuiſine*, comprehend all utenſils for the ſervice of the kitchen, whether of iron, braſs, copper, or other matters. Others take the term in a narrower ſenſe, and reſtrain it to utenſils of braſs or copper.

A ſociety for the mineral and battery work of England was incorporated by queen Elizabeth.

Battery, in *Electricity*, is a combination of coated ſurfaces of glaſs, ſo connected together, that they may be charged at once, and diſcharged by a common conductor. Mr. Gralath, a German electrician, was the firſt who contrived to increaſe the ſhock, by charging ſeveral phials at the ſame time. Dr. Franklin, after he had analyzed the Leyden phial, and found that it loſt at one ſurface the electric fire which it received at the other, conſtructed a battery, conſiſting of eleven panes of large ſaſh-glaſs, coated on each ſide, and connected in ſuch a manner that the whole might be charged together, and with the ſame labour as one ſingle pane; and by bringing all the giving ſides into contact with one wire, and all the receiving ſides with another, he contrived to unite the force of all the plates, and to diſcharge them at once. A more complete battery is deſcribed by Dr. Prieſtley, of which he ſays, that after long uſe he ſees no reaſon for wiſhing the leaſt alteration in any part of it. This battery (ſee *Plate* I. *Electricity*, *fig.* 1.) conſiſts of 64 jars, each ten inches long, and $2\frac{1}{2}$ inches in diameter, coated within $1\frac{1}{2}$ inch of the top; and contains in the whole 32 ſquare feet. The wire of each jar has a piece of very ſmall wire twiſted about the lower end of it, to touch the inſide coating in ſeveral places; and it is put through a pretty large piece of cork, within the jar, to prevent any part of it from touching the ſide, which would tend to promote a ſpontaneous diſcharge. Each wire is turned round, ſo as to make a hole at the upper end; and through theſe holes a pretty thick braſs rod with knobs paſſes, one rod ſerving for one row of the jars. The communication between theſe rods is made by laying over them all a thick chain. When part only of the battery is uſed, the chain is laid over as many rods as will furniſh the required number of rows of jars. The bottom of the box, in which the jars ſtand, is covered with a plate of tin, and a bent wire touching the plate paſſes through the box, and appears on the outſide. To this wire any conductor deſigned to communicate with the outſide of the battery is faſtened, as the ſmall wire in the figure, and the diſcharge is made by bringing the braſs knob to any of the knobs of the battery. When a very great force is required, the quantity of coated ſurface may be increaſed, or two or more batteries may be uſed. Franklin's Exp. and Obſ. ed. 1769. p. 28. Prieſtley's Hiſt. &c. of Electricity, ed. 1775. vol. ii. p. 99.

However complete the battery above deſcribed appeared to be at the time of its conſtruction, later electricians have diſcovered many imperfections to which it was ſubject; of which the principal are thoſe that reſult from the form and ſize of the jars, the ſubſtance of the glaſs, the height of the coating, and the connections within the battery. In conſequence of theſe imperfections in its ſtructure and contrivance, it is prevented from receiving more than about half the charge which it ought to receive in proportion to the quantity of its coated ſurface.

The moſt perfect batteries of modern conſtruction, ſince that of Dr. Prieſtley, have been made in Holland for Teyler's muſeum at Haerlem, by Mr. Cuthbertſon of Poland-ſtreet, London, then reſiding at Amſterdam. Of theſe batteries there are two, differing in their magnitude and mode of conſtruction, but allowed to be equally perfect. The firſt was completed in the year 1784, and is compoſed of 135 jars in 9 boxes, each containing 15, which may be uſed ſeparately or combined, as the nature of the experiment requires. Each box is a ſeparate battery of itſelf; and the deſcription of one box with a view of the figure, will be ſufficient for explaining its conſtruction and uſe. In *Plate* I. *Electricity*, *fig.* 2. is exhibited a perſpective view of Teyler's firſt battery, with its parts arranged in proper order for receiving a charge from the electrical machine. Each box, as we have already obſerved, contains 15 jars; each jar is 11 inches high, and 6 inches in diameter, contracted at the mouth to 4 inches, and coated ſo as to contain about 140 ſquare inches; and thus the whole battery will contain about 132 ſquare feet of coated ſurface. Each box is divided into 15 partitions, 5 of which are in the length and 3 in the breadth; the height of the ſides of the box being ſomewhat lower than the coating of the jars, as are alſo the partitions in which they ſtand. The lid of the box is made without hinges, for the convenience of releaſing it from the box, that it may be removed while experiments are performed. It is taken off by lifting it upwards. The outſide coatings of the jars are connected by means of croſs wires paſſing under the bottom of each jar; and thoſe on the inſide by means of a braſs frame, bearing 15 braſs balls, fixed upon the frame above the centre of each jar. All theſe balls, excepting the four at the corners, have wires ſcrewed to them and hanging downwards into the inſide of each jar; but the wires of the four corner jars are ſcrewed to a foot, which is cemented to the bottom of each in the inſide. Upon theſe wires the whole frame reſts, and is kept in its proper poſition. The four corner balls have holes, which receive the ends of the wires, and terminate at a proper height from the jars. By this contrivance the inſide connecting frame may at any time be eaſily removed; and as this part of the machine is important, the conſtruction of the ſaid frame is ſhewn ſeparated from the battery in *fig.* 3. It is according to the above conſtruction that Mr. Cuthbertſon forms his preſent batteries, excepting that he has increaſed the ſize of the jars, ſo as to make one battery contain about 17 ſquare feet; and he engages to prove by experiment, that the batteries of his conſtruction are far ſuperior to any others. Teyler's ſecond grand battery was finiſhed by Mr. Cuthbertſon in 1789. This is the largeſt and moſt complete battery that was ever made. The whole battery, ſtanding in proper order for receiving a charge, is exhibited in *fig.* 4. It conſiſts of 100 jars of the ſame ſhape with that of thoſe already deſcribed, only that they are ſo enlarged in ſize, that each of them contains $5\frac{1}{2}$ ſquare feet of coated ſurface, inſtead of 140 inches, and the whole battery contains 550 ſquare feet of coating; and for conveniency, it is put into four ſeparate caſes, each containing 25 jars in the form of a ſquare, 5 on each ſide. The boxes are lined with lead on the inſide for forming the outſide communication; each jar has a perpendicular ſtand reſting upon its bottom, and ſupported from falling ſideways by three ſtays on the inſide. Upon the top is ſcrewed a three inch braſs globe, from which proceeds a braſs tube about one inch in

diameter, to a large brass globe, supported by the middle jar at a proper height, so as to keep the inside communication properly arranged. A view of the figure will shew how the four are combined, so as to charge and discharge all the 100 jars at once.

Lieutenant colonel Haldane proposes the following method for measuring the force of an electrical battery, during the time of its being charged.

Let the battery be insulated, and at a small distance from it place an uninsulated electrical jar, and near the jar, one of Mr. Cuthbertson's electrometers. The electrometer being adjusted according to the degree of force which is intended to be employed as a measure of force to be communicated to the battery, connect the electrometer with the jar; make a metallic communication between the interior side of the jar and the exterior side of the battery, and connect the interior side of the battery with the conductor of an electrical machine: then, by the operation of the electrical machine, the battery receives a quantity of the electrical fluid, and becomes charged. The fluid, which departs from the exterior side of the battery, is received by the electrical jar, which also becomes charged; but this jar, being connected with the electrometer, explodes as soon as it acquires a force sufficient to put the electrometer into motion. The quantity of the electrical fluid which is received by this jar, between each of the explosions, is a measure of the quantity of the fluid in the battery; and the number of explosions or discharges of this jar shews the number of measures which the battery contains, and consequently the force which it is capable of exerting when discharged.

For the author's demonstration of this method, and the illustration of it by appropriate experiments, we must refer to Nicholson's Journal, vol. i. p. 156, &c.

BATTERY, *Galvanic*; the name usually given to an apparatus for accumulating the electricity which is produced by the mutual agencies of certain metallic and carbonaceous substances, and peculiar fluids.

The first instrument of this kind was invented by the celebrated Volta of Pavia, in 1800, and various forms of it have been since adopted by different philosophers.

The original battery, or the electrical pile, is composed of plates of zinc, plates of silver, and pieces of pasteboard, of the size of the plates, moistened in a solution of salt in water: and arranged in the order of zinc, silver, pasteboard, zinc, silver, pasteboard, and so on, till a series sufficiently numerous is formed. On account of the expence of silver, copper has been lately generally substituted for it, with but little diminution of effect; and solutions of muriate of ammoniac, of nitrous acid, and of muriatic acid, have been employed instead of the solution of common salt, with very great advantage as to the increase of the power of the combination. In general any two metallic substances which are perfect conductors of electricity, may be used, provided the interposed fluid is capable of oxidating at least one of them.

The powers of galvanic batteries appear to be very much connected with the chemical changes going on in them, and hence plates of one metal may be made to supply the place of the two metals provided their different sides be exposed to different chemically acting fluids, as has been shewn by the experiments of Mr. Davy. Thus copper, silver, and lead, all form efficient combinations when they are arranged with two different sets of pasteboard, one moistened with diluted nitric acid, and the other with solution of hydrosulphuret of potash; the order being metal, pasteboard moistened with acid, pasteboard moistened with hydrosulphuret, &c. In such a case, if the battery is required to be of considerable permanency as to its effects, it is necessary to separate the pasteboard moistened in the chemical agents from each other by a third set of pasteboards, moistened in common water.

In instances when piles are erected perpendicularly either with two metals or with one metal, in consequence of the oxidation and the loss of moisture from pressure and evaporation, the electrical action usually ceases after a few days; and in order to renew it, a second construction of the series becomes necessary. Several methods have been proposed for making instruments more permanent in their operation than the pile, and more easily rendered active; but the most ingenious contrivance appears to be that of the trough, discovered by Mr. Cruickshank. It consists of a box of baked wood, in which plates of copper and zinc, or of silver and zinc soldered together at their edges, are cemented in such a manner as to leave a number of water-tight cells, corresponding to the number of the series: the arrangement becomes active when the cells are filled with the proper saline fluids; and it may at any time be easily freed from oxide by the use of muriatic acid.

In the common apparatus of Volta, that part bounded by the most oxidable metal, as, for instance, the zinc, is found in a positive state, with regard to electricity, and the other part, as the copper, in a negative state; and when a communication is made between the two ends, by means of a conducting body, a constant circulation of electricity is established.

The electricity of the galvanic battery is capable of being partly transferred into the Leyden phial; and its effects, as has been fully shewn by the experiments of Messrs. Nicholson, Carlisle, Woolaston, Van Marum, and Ritter, are similar to those of common electricity, in a low state of intensity. It gives shocks to living animal organs, and excites muscular contractions in bodies for a considerable time after death. It assumes the form of fire in passing from one conducting body to another in its highly concentrated state; and it ignites small metallic wires or leaves, and causes them to enter into combustion. It sets fire to charcoal, sulphur, alcohol, and other inflammable bodies; and it rapidly decompounds water and various other fluids.

The intensity of the electricity in Galvanic batteries is greater in proportion as the series composing them are more numerous: but the quantity of it depends upon the quantity of surface they contain. Hence equal numbers of large and small plates arranged in different batteries produce nearly the same effects on the human body which is an imperfect conductor, and which can admit of the passage only of a certain quantity of electricity of a low intensity in a given time; but the large plates are in a determinate ratio, much more powerful in igniting the metals, and in affecting perfect conductors through which a large quantity of electricity, in any state of intensity, easily and instantly passes.

Many important philosophical discoveries, which will be fully described in the article GALVANISM, have been already made, by means of the galvanic apparatus, in different parts of Europe; and a number of enlightened experimenters have been employed in investigating the principles on which its operation depends. The theory of it is, however, as yet obscure, and the perfect developement of it will probably be connected with views more profound than any that have been as yet obtained of the nature and agencies of electricity, and its relations to chemical changes. See Phil. Trans. for 1800 and 1801. Nicholson's Journal, vol. iv. and v., and vol. i. new series. Journals of the Royal Inst. vol. i. Tilloch's Phil. Mag. vol. x. xi. and xii. Annalen der physik. Journal de physique. Annales de Chimie.

BATTEURS *d'estrade*, scouts or horsemen, sent out before, and on the wings of an army, two or three miles, to make

make discoveries; of which they are to give an account to the general. See SCOUTS.

BATTEUX, CHARLES, in *Biography*, honorary canon of the church at Rheims, which was his native city, became professor of philosophy at the Royal College of Paris, and distinguished himself by his judgment, learning, and character. He was chosen a member of the Academy of Inscriptions in 1759, and of the French Academy in 1761. His death, which happened at Paris in 1780, is supposed to have been accelerated by the chagrin resulting from the want of success of the elementary works which he drew up by order of government, for the use of the military school. His chief publications, written in French, are the following: "A Translation of the Works of Horace," 2 vols. 12mo.; "The Morals of Epictetus, extracted from his own writings," 12mo. 1758; "A Course of the Belles Lettres," 5 vols. 12mo. 1760; to which are annexed his treatises, before published; "The Fine Arts reduced to a single Principle," and "On Oratorical Composition;" "History of Primary Causes," 8vo. 1769; "The four Poetics of Aristotle, Horace, Vida, and Boileau, with Translations and Remarks," 2 vols. 8vo. 1771; "Elements of Literature, extracted from the Course of Belles Lettres," 2 vols. 12mo.; "Elementary Course for the Use of the Military School," 45 vols. 12mo.; and "Translations of Ocellus Lucanus, and Timæus Locrensis." Nouv. Dict. Hist.

BATTIE, WILLIAM, born in Devonshire, in 1704, received his education at Eton School, whence he went in 1722, to King's College in Cambridge. On the death of his father, his mother moved to Eton, and afterwards to Cambridge, that she might be near her son, and assist in lessening his expences. The Craven Scholarship becoming vacant soon after his admission; the Doctor offered himself as a candidate, and had the good fortune to be successful. Of the importance this small stipend, only 25l. per annum, was to him, we may judge, from what he says on the subject, in a letter to a friend. "I shall now," he says, "begin to live agreeably, and have, I hope, got through the worst part of my life." A recollection of the utility of this stipend to him, it is probable, Bowyer says, induced him, in the latter part of his life, to found a similar scholarship, at the same university. Pursuing his studies, in 1726, he was made Bachelor, and in 1730, Master of Arts; he was also now one of the Fellows of the College. In 1729 he published a specimen of an edition of Isocrates, in one volume 8vo. He at first proposed studying the law, and his finances not being equal to the expence of taking chambers in one of the inns of court, in London, he communicated his intention to two wealthy cousins in the city, of the name of Coleman; but as they declined assisting him, he turned his mind to the study of medicine, and in 1737, he took the degree of Doctor in that faculty. For a short time he practised medicine at Cambridge. Removing thence, he went to reside at Uxbridge, where, acquiring the confidence of some of the principal families in the neighbourhood, he soon came into considerable practice. About the year 1739, he married the daughter of Barnham Good, one of the masters of Eton, having kept up an intimacy with the lady from the time of his quitting the school. He was now also noticed by his relations, the Colemans, who were so much gratified by the consequence to which they saw him rising, that the survivor of them left him 30,000l. Continuing a few years longer at Uxbridge, he at length removed to London. In 1745, we find him, Fellow of the College of Physicians. The same year he spoke the Harveian Oration, which was published the following year. About the same time he was elected Fellow of the Royal Society. In 1749, he completed his edition of Isocrates, which was published in two volumes, 8vo. Though this work was not well received by the critics, it was always a great favourite with the Doctor. The year following he experienced a serious mortification. For taking an active part in a dispute between the College of Physicians and Dr. Schomberg, and being one of the most strenuous in opposing his admission as a Fellow, he was held up to ridicule in a satyrical poem, under the name of the Battiad, in which a ludicrous account is given of the dispute, as well as some severe sarcasms on his favourite work. The Battiad is supposed to have been the joint production of Moses Mendez, Paul Whitehead, and Dr. Schomberg. It was published, at the time, in folio, and afterwards, in 1776, in a collection of humorous pieces, in 2 vols. 8vo. Another edition of this collection, much enlarged, was printed in 1792, in 4 vols. 12mo. There being at this time but one public asylum in London, for the reception of insane persons, which had been long found insufficient to contain all the indigent objects labouring under this affliction, a subscription was set on foot by some wealthy and benevolent individuals, to erect another edifice for the purpose, on the plan of Bethlehem Hospital. The scheme was so much approved, and so largely patronized, that in 1751 the managers of the fund were enabled to take, and fit up, a large building on the north side of Moorfields for the purpose, and as Dr. Battie had been very active in promoting the subscription, he was appointed physician to the institution, which was called St. Luke's Hospital. It contained one hundred and ten beds, eighty of which were appropriated to recent cases, such as were supposed capable of being relieved, or cured by medical treatment, and thirty for old and incurable cases. By the good conduct of the managers, and the character the charity thence acquired, the committee found themselves enabled, in 1781, to take a piece of ground, in Old Street, and erect a large and magnificent building for the reception of the patients, who were removed into it in 1786. The new building contains beds for 185 recent and curable patients, and for 120 incurables. The present physician, who was elected into the office, in 1781, is Dr. Samuel F. Simmons.

In 1757 Dr. Battie published a treatise on Madness, 4to. in which, having thrown out some censures on the medical practice formerly used in Bethlehem Hospital, Dr. John Monro, whose father was implicated in the censures, replied, rebutting his charges, and having humorously taken for the motto to his remarks, "O major tandem parcas insane minori," the Dr. was afterwards called by the wits, Major Battie. In 1762 he published "Aphorismi de cognoscendis et curandis morbis nonnullis, ad principia animalia accomodati," taken principally from his Lumleian lectures. In February 1763 he was examined before a committee of the House of Commons on the state of the private mad-houses in the kingdom, which he shewed them, from instances that had fallen under his notice, to be so ill conducted, as sometimes to be used as prisons for persons whose relatives were interested in getting them out of the way. This gave rise to a series of regulations, made by the legislature, with a view of preventing the continuance of those practices; but they were not completely suppressed until the year 1774, when the power of licensing private mad-houses was vested in the college of physicians.

As the Doctor had for several years confined his practice to maniacal cases, he had now leisure to indulge his inclination for building, to which he was much attached. Besides a large house, No. 88, Great Russel Street, Bloomsbury, for his town residence, he built an elegant villa at Twickenham, lately the residence of the Countess Dowager Pawlet. He also

also erected a more considerable house on the banks of the Thames, at Marlow, in Buckinghamshire, where he passed much of his leisure time, in the latter part of his life. These houses were built under the immediate inspection of the Doctor, and after his own designs. He died of a paralytic stroke, at his house in Great Russell Street, the 13th of June 1776, aged seventy-two years. Having no male issue, his great property, upwards of 90,000l. was divided between his three daughters, of whom the eldest was married to captain, afterwards admiral sir George Young, who sold the house at Marlow, called Court Garden, to Richard Davenport, esq. an eminent surgeon of Essex Street, in the Strand, London; the second, to Philip Rashleigh, esq. a gentleman of Cornwall; and the third, to the late sir John Call, baronet.

BATTIFOLIUM, or Battifollum, in *Antiquity*, a kind of tower or defence, frequently mentioned by Latin historians of the middle age. It seems to have been wood, and to have been erected on sudden and hasty occasions.

BATTLE, in *Geography*, a small market town of England, in a hundred of the same name, in Sussex, is situated six miles from Hastings, and 56 south-east from London. It was originally called Epiton; but the decisive victory at Hastings, gained by William, duke of Normandy, over king Harold, induced the former, when he was fixed on the throne, and founded the abbey, to change the name of the town to that which at present it retains. Battle consists of one principal street, indifferently built; and the parish church is a neat building, the incumbent of which is stiled dean of Battle. The inhabitants support also a charity school for forty boys. The gunpowder which is manufactured here is esteemed the best in Europe, and hence called "Battle powder," though the town cannot boast of any other trade. The neighbourhood, however, is so fertile, that an incredible number of large cattle are constantly sent up to the London markets for sale, especially what are denominated stall-fed oxen, which produce the largest beef in England. Henry I. granted a market to be kept on every "*Lord's Day*;" but Anthony, lord Montague, who, about 1600, built himself a beautiful seat here, obtained an act of parliament to change the market day to Thursday, as it now continues. Battle is reckoned unhealthy, on account of its low dirty situation. Its greatest boast is the magnificent abbey built by William the Conqueror, on Heathfield, near the town, in 1067, to compensate, in some small degree, for the effusion of blood the year before; the highest altar of the fabrick standing on the very spot where the body of the brave but unfortunate Harold was found. This abbey was filled with Benedictine monks from Normandy, and endowed with such extensive privileges, that if a convict were passing to execution, it was in the abbot's power instantly to release him, should they meet on the road. At the dissolution its revenues were valued at 856l. 14s. 7d. The ruins of the abbey are very stately; and what remains undestroyed, serves as a house for the family of Webster, and for the purposes of the town, the gate-house being used as the hall in which are held sessions and other meetings for this peculiar jurisdiction. From Standard and Tillman hills are very extensive prospects. A fact related of abbot Hamo, in 1381, is worth recording; a body of Frenchmen landing and attacking Rye and Winchelsea, Hamo raised whatever force he could collect, repaired to Winchelsea, and having fortified it as well as he was able, checked the progress of the enemy, till the force of the country was sufficiently powerful effectually to repel them. Battle has three fairs, and two hundred and ninety-four houses, inhabited by 2040 persons.

Battle *Island*. See Bay of *St. Louis*.

Battle, a river in New South Wales, which runs N.E. into Saskahawen river, S.E. from Manchester house.

Battle, or *Battel*, *Wager of*, in *Law*, a species of trial of great antiquity, which had its origin in the military spirit of our ancestors, blended with superstition, and which consisted in a kind of appeal to Providence, under an apprehension and hope, however presumptuous and unwarrantable, that heaven would give the victory to him who had the right. Concerning the early history and general prevalence of this mode of trial, see Combat. This trial, which had been the immemorial practice of all the northern nations, and which had been first reduced to regular and stated form among the Burgundi, about the close of the fifth century, and passed from them to the Franks and Normans, was introduced into England, among other Norman customs, by William the Conqueror; but it was only used in three cases, one military, one criminal, and the third civil: the first in the court martial, or court of chivalry and honour; the second in appeals of felony; and the third upon issue joined in a writ of right. In these writs of right, the "jus proprietatis" could not often be ascertained without difficulty; and this mode of determining it was allowed for the sake of such claimants as might have the true right, but yet by the death of witnesses, or other defect of evidence, be unable to prove it to a jury. Although the writ of right itself, and of course this mode of trial, be at present much disused, yet it is still law and in force, if the parties chuse to abide by it.

The last trial by battel that was waged in the court of common pleas at Westminster, though one afterwards occurs in the court of chivalry in 1631, and another in the county palatine of Durham in 1638, was in the 13th year of queen Elizabeth, A.D. 1571; and was held in Tothill fields Westminster, "non sine magna juris consultorum perturbatione," says sir Henry Spelman, who was himself a witness of the ceremony. The form of it, described by judge Blackstone, is as follows.

When the tenant in a writ of right pleads the general issue, viz. that he hath more right to hold, than the demandant hath to recover; and offers to prove it by the body of his champion, which tender is accepted by the demandant; the tenant in the first place must produce his champion, who by throwing down his glove as a gage or pledge, thus wages or stipulates battel with the champion of the demandant; who, by taking up the gage or glove, stipulates on his part to accept the challenge. The reason why it was waged by champions, and not by the parties themselves, in civil actions, is because, if any party to the suit dies, the suit must abate and be at an end for the present; and therefore no judgment could be given for the lands in question, if either of the parties were slain in battel; and also that no person might claim an exemption from this trial, as was allowed in criminal cases, where the battel was waged in person.

A piece of ground is then in due time set out, of sixty feet square, enclosed with lists, and on one side a court erected for the judges of the court of common pleas, who attend there in their scarlet robes; and also a bar is prepared for the learned serjeants at law. When the court sits, which ought to be by sun-rising, proclamation is made for the parties, and their champions; who are introduced by two knights, and are dressed in a coat of armour, with red sandals, barelegged from the knee downwards, bareheaded, and with bare arms to the elbows. The weapons allowed them are only batons, or staves, of an ell long, and a four-cornered leather target; so that death very seldom ensued this civil combat. In the court military indeed they fought with sword and lance, according to Spelman and Rushworth; as likewise in France only villeins fought with the buckler and baton, gentlemen armed at all

all points. And upon this and other circumſtances, the preſident Monteſquieu hath, with great ingenuity, not only deduced the impious cuſtom of private duels upon imaginary points of honour, but hath alſo traced the heroic madneſs of knight-errantry, from the ſame original of judicial combats. But to proceed.

When the champions, thus armed with batons, arrive within the liſts, or place of combat, the champion of the tenant then takes his adverſary by the hand, and makes oath that the tenements in diſpute are not the right of the demandant; and the champion of the demandant, then taking the other by the hand, ſwears in the ſame manner that they are; ſo that each champion is, or ought to be, thoroughly perſuaded of the truth of the cauſe he fights for. Next an oath againſt ſorcery and enchantment is to be taken by both the champions, in this or a ſimilar form; "hear this, ye juſtices, that I have this day neither eat, drank, nor have upon me, neither bone, ſtone, ne graſs; nor any inchantment, ſorcery, or witchcraft, whereby the law of God may be abaſed, or the law of the devil exalted. So help me God and his ſaints."

The battel is thus begun, and the combatants are bound to fight till the ſtars appear in the evening: and, if the champion of the tenant can defend himſelf till the ſtars appear, the tenant ſhall prevail in his cauſe; for it is ſufficient for him to maintain his ground, and make it a drawn battel, he being already in poſſeſſion; but, if victory declares itſelf for either party, for him is judgment finally given. This victory may ariſe, from the death of either of the champions: which indeed hath rarely happened; the whole ceremony, to ſay the truth, bearing a near reſemblance to certain rural athletic diverſions, which are probably derived from this original. Or victory is obtained, if either champion proves *recreant*, that is, yields, and pronounces the horrible word of *craven*: a word of diſgrace and obloquy, rather than of any determinate meaning. But a horrible word it indeed is to the vanquiſhed champion: ſince as a puniſhment to him for forfeiting the land of his principal, by pronouncing that ſhameful word, he is condemned, as a recreant, "amittere liberam legem," that is, to become infamous, and not be accounted "liber et legalis homo;" being ſuppoſed by the event to be proved forſworn, and therefore never to be put upon a jury, or admitted as a witneſs in any cauſe.

This is the form of a trial by battel; a trial which the tenant, or defendant, in a writ of right, has it in his election at this day to demand; and which was the only deciſion of ſuch writ of right after the conqueſt, till Henry II, by conſent of parliament, introduced the *grand aſſiſe*, a peculiar ſpecies of trial by jury, in concurrence therewith; giving the tenant his choice of either the one or the other. Which example, of diſcountenancing theſe judicial combats, was imitated about a century afterwards in France, by an edict of Louis the Pious, A. D. 1260, and ſoon after by the reſt of Europe. The eſtabliſhment of this alternative, Glanvil, chief juſtice to Henry II., and probably his adviſer herein, conſiders as a moſt noble improvement, as in fact it was, of the law.

The trial by battel may alſo be demanded at the election of the appellee, in either an appeal or an approvement, and it is carried on with equal ſolemnity as that on a writ of right; with this difference, that there each party might hire a champion, but here they muſt fight in their proper perſons. And therefore if the appellant or approver be a woman, a prieſt, an infant, or of the age of ſixty, or lame, or blind, he or ſhe may counterplead and refuſe the wager of battel; and compel the appellee to put himſelf upon the country. Alſo peers of the realm, bringing an appeal, ſhall not be challenged to wage battel on account of the dignity of their perſons; nor the citizens of London, by ſpecial charter, becauſe fighting ſeems foreign to their education and employment. So likewiſe if the crime be notorious; and if the thief be taken with the "mainour," or the murderer in the room with a bloody knife, the appellant may refuſe the tender of battel from the appellee; for it is unreaſonable that an innocent man ſhould ſtake his life againſt one who is already half convicted.

The form and manner of waging battel upon appeals are much the ſame as upon a writ of right: only the oaths of the two combatants are vaſtly more ſtriking and ſolemn. The appellee, when appealed of felony, pleads *not guilty*, and throws down his glove, and declares he will defend the ſame by his body: the appellant takes up the glove, and replies that he is ready to make good the appeal, body for body. And thereupon the appellee, taking the book in his right hand, and in his left the right hand of his antagoniſt, ſwears to this effect. "Hoc audi, homo, quem per manum teneo, &c." "Hear this, O man whom I hold by the hand, who calleſt thyſelf John, by the name of baptiſm, that I, who call myſelf Thomas, by the name of baptiſm, did not feloniouſly murder thy father, William by name, nor am any way guilty of the ſaid felony. So help me God, and the ſaints; and this I will defend againſt thee by my body, as this court ſhall award." To which the appellant replies, holding the bible and his antagoniſt's hand, in the ſame manner as the other: "Hear this, O man, whom I hold by the hand, who calleſt thyſelf Thomas, by the name of baptiſm, that thou art perjured; and therefore perjured, becauſe that thou feloniouſly didſt murder my father, William by name. So help me God and the ſaints; and this I will prove againſt thee by my body, as this court ſhall award." The battel is then to be fought with the ſame weapons, viz. batons, the ſame ſolemnity, and the ſame oath againſt amulets and ſorcery, that are uſed in the civil combat: and if the appellee be ſo far vanquiſhed, that he cannot or will not fight any longer, he ſhall be adjudged to be hanged immediately; and then, as well as if he be killed in battel, providence is deemed to have determined in favour of the truth, and his blood ſhall be attainted. But if he kills the appellant, or can maintain the fight from ſun-riſing till the ſtars appear in the evening, he ſhall be acquitted. So alſo if the appellant becomes recreant, and pronounces the horrible word of *craven*, he ſhall loſe his "liberam legem," and become infamous; and the appellee ſhall recover his damages, and alſo be for ever quit, not only of the appeal, but of all indictments likewiſe for the ſame offence. Blackſt. Com. vol. iii. p. 337, &c. vol. iv. p. 346, &c.

Battle, in the *Military Art*, ſignifies an engagement between two hoſtile armies, drawn up in regular order, in a country ſufficiently open for them to encounter in front at the ſame time; or ſhould ſome obſtacle occur to hinder the readily entering into action of the whole line, for the greater part of an army to begin the attack upon the troops oppoſed to them, the reſt remaining in ſight, ready to act as occaſion may require their aſſiſtance or co-operation.

Other conflicts, when only certain points of the armies are engaged, though generally of much longer duration, and often attended with ſuperior ſlaughter, are only termed fights, or, as they are called by the French, *combats*. (Feuquiere's Memoires, chap. 80.) Under this denomination rank therefore, though as obſtinate as moſt others on record, the engagements of Seneffe, of Steinſterke, of Oudenarde, and of latter days, thoſe of Zorndorff and Hochkirchen, equally celebrated on account of the carnage which attended them, and the importance of their conſequences.

The

The loſs of a battle involves almoſt always that of the artillery of the vanquiſhed, and frequently of the baggage. As all theſe loſſes muſt be repaired before the beaten army can again look their conquerors in the face, the enemy conſequently remains for a length of time maſter of the country, and at liberty to carry all his projects into execution. Theſe inconveniences are rarely ſo ſeverely felt in caſe of ill ſucceſs in a partial combat, however deſperate. Greater part of the artillery is generally preſerved, and the baggage almoſt entire; for the oppoſite armies not cloſing in front, the diviſions which have been engaged alone become the ſufferers.

But in a ſet or pitched battle, the preſent object of attention, where both parties have time and room ſufficient to arrange and extend themſelves in regular order, the caſe is widely different. The leaſt unforeſeen advantage afforded to an enemy, or the moſt trivial circumſtance unattended to, may baffle the efforts of the moſt experienced general, may ſnatch the palm of victory from the hands of numbers and valour, convert a ſucceſsful purſuit to a diſorderly flight, and lead to the irretrievable ruin of an army, poſſibly even of a ſtate.

The ancients never joined battle without a great deal of preparation and religious ceremony; as making auguries, offering up ſacrifices, haranguing to excite the courage of the ſoldiers, giving the word, or a teſſera, &c. The ſignals of battle were, among the Romans, ſounding the claſſicum, or general charge, ſtriking upon their ſhields with their javelins, and diſplaying from the prætorium a peculiar flag, called by Plutarch (in Fab. Max. and in Pomp.) a red mantle. Cæſar alſo mentions this flag in his B. Gallico, L. ii. c. 20. In the moment of onſet, a ſhout was raiſed by the whole army, for the double purpoſe of encouraging their fellows, and ſtriking terror into the enemy. Similar to this was the cuſtom which prevailed among the Greeks, of ſinging the pæan, or hymn of combat, as they moved forward to the charge.

The rigid ſuperſtition of the Jews at firſt prevented them from fighting, or even from defending themſelves, on the ſabbath-day; but fatal experience of the inconvenience of the latter precept, induced them, in their wars with the princes of the Syro-Macedonian dynaſty, to diſpenſe with its obſervance. It was, however, in conſequence of the averſion they ſtill retained to a violation of that holy day, that Pompey became maſter of Jeruſalem by aſſault, without any effectual reſiſtance. Dion. Caſſ. lib. xxxvii.

The Romans did not carry their regard for religion ſo far. They had indeed their peculiar days, called "præliares dies," wherein alone it was *lawful* to join battle; and others whereon it was unfit, called "dies atri;" but leſs ſcrupulous than the Hebrews, theſe latter were only obſerved in reſpect of attacking. No day was too ſacred for them to defend themſelves in. (Macrob. Saturn. lib. i. c. 6.) We obſerve frequent inſtances of their engaging by night. It was by night that Scipio deſtroyed near Utica the armies of Aſdrubal and Syphax (Liv. xxx. c. 5.); and the deciſive battle between Pompey and Mithridates (Plut. in Pomp.) was fought by moonlight.

The Athenians were prohibited, by the ancient laws of their country, from drawing out their forces for battle till after the 7th day of the month; and Lucian, ſpeaking of the Lacedæmonians, relates, that by the ſtatutes of Lycurgus, they were not to fight before the full-moon. A ſimilar cuſtom prevailed among the ancient Germans, who reputed it an impiety to engage in the wane of the moon; and Cæſar intimates that his victory over Arioviſtus was owing to that prince's having, contrary to the religious notions of his countrymen, fought during the decreaſe of the moon. The barbarians were intimidated with the apprehenſion, and afforded Cæſar an eaſy conqueſt. To uſe his own words: "Acie commiſſa impeditos religione hoſte vicit." Cæſ. de Bel. Gal. lib. i.

An idea of the manner in which warlike operations were carried on, and battles fought, among nations in their primitive barbarous ſtate, has been given under the article ATTACK. We ſhall not here repeat what has been already ſaid on that ſubject.

Authors are fond of quoting the battle of Thymbra, between Cræſus and Cyrus (Xenoph. Cyrop. lib. vi, vii.), as the firſt general engagement ever fought. But as it is only related in the Cyropædia, a work whoſe hiſtorical veracity has been ſeverely called in queſtion, and as its recital is attended with circumſtances of the moſt romantic caſt, we ſhall content ourſelves with barely mentioning it, and paſs on to inſtances better authenticated, and leſs embelliſhed by the marvellous.

At the battle of *Marathon* (Herod. Erat. ſect. 107. 117.) the Greeks, conducted by Miltiades the Athenian, demonſtrated the poſſibility of compenſating by diſcipline, valour, and military ſkill, for any inferiority in numbers. A manœuvre not without its faults, but novel in the art of war as then underſtood, obtained for them a victory as ſplendid as extraordinary; and which we may rank as the earlieſt in profane hiſtory, of which any particular account has been tranſmitted to us.

The battle of *Platæa*, from the numerous forces engaged on either ſide, beſt deſerves the denomination of a pitched battle. (Herod. Calliope, ſect. 61—74.) It was fought upon the true ancient model. Hurry and confuſion reigned predominant. Greeks and Perſians engaged in two ſeveral places, without any attempt at co-operation, or the ſmalleſt exertion of military genius on the part of their commanders. In the true language of Homer, here "man was oppoſed to man, and ſhield met ſhield;" and the Greeks ſeem to have fairly atchieved this aſtoniſhing conqueſt by excelling their adverſaries in the vulgar qualities of bodily ſtrength and brutal courage.

After toiling through the heavy and ſanguinary period of the Peloponneſian war, where, though convinced at every page of the rapid improvement of the Greeks in tactics, we do not meet with any of thoſe general or important conteſts, the ſubject of the preſent article; and after taking a curſory examination of the maſſacre of Cynaxa; we at length arrive at the battle of *Leuctra*. (Plut. in Pelop. Xenophon. Hellen. lib. vi. Diod. Sic. lib. xv.) This brilliant engagement, between numbers comparatively trifling, deſerves from a ſcientific reader more attention than that of Platæa, as it is indiſputably the firſt occaſion on which victory was obtained merely in conſequence of an able diſpoſition. The famous column of Epaminondas, which obliged 24,000 Lacedæmonians, the braveſt troops in Greece, to yield the honour of the field to 6,000 Thebans, has been repeatedly cited with admiration by the moſt learned authors, and imitated by the firſt military geniuſes, on various occaſions.

The battle of *Mantinæa*, the next inſtance worthy of particular obſervation, was won by the ſame general (Xenoph. Hellen. lib. vii.) on the very ſame principle. The Lacedæmonians, though conducted by their king Ageſilaus, one of the ableſt leaders of his age, ſuffered themſelves to be again deſtroyed, by the preciſe diſpoſition which had already proved ſo fatal to them at Leuctra. The Spartan glory, by the loſs of this battle, ſuſtained a blow it never afterwards recovered. Epaminondas, whoſe genius had made the braveſt ſoldiers in all Greece ſhrink before weaker nerves, meaner ſpirits, and inferior

inferior numbers, expired on the field he had immortalized no less by his personal exploits, than his able arrangements before the action. Henceforth pitched battles are more frequently distinguished by masterly strokes of generalship.

The formidable phalanx, then a late invention, no less than his own military talents, secured to Philip of Macedon his important triumph at Chæronæa. (Diod. Sic. lib. xvi. ch. 86.) The three great battles of Alexander against Darius were gained but with little difficulty, owing to the superior tactics of the Greeks. Those of Issus and Arbela in particular (Arrian. Alex. iii. sect. 15. Quin. Curt. lib. iv.) were only slaughter. When we read that in the latter, with the loss of only 1200 of his own men, the Macedonian destroyed, according to the least exaggerated accounts, 40,000 of the Persians (Arrian says 300,000), it is pretty plain that the resistance was but nominal, and that the conquerors had little more trouble than to do execution on their enemies.

The Grecian history, subsequent to Alexander, is replete with instances of pitched battles; but of which little or no particular account has been left us. We are for the most part in the dark with respect to the order observed in drawing up the rival armies, and the manœuvres which accelerated or retarded a victory. The abrupt termination of the history of Diodorus Siculus, deprives us of any details respecting the battle of Ipsus, except the brief and unsatisfactory account of Plutarch (in Dem.). The number of the slain alone leaves us sometimes a little room to judge of the importance or the obstinacy of a conflict.

Polybius, however, has left us (lib. ii.) a full and interesting account of the decisive engagement at *Sellasia*; which, for a time, completely subjected the Grecian states to the power of Macedon. Here again the phalanx determined the fortune of the day, and demonstrated the superiority of its close and impenetrable order, over the more loose and shallow battalions of their antagonists.

Among the Romans we shall find still further occasion to remark the rapid improvement of ancient tactics. Guided by Polybius and Livy, we peruse with peculiar interest the account of battles fought for the mastery of the world, perpetually differing in situation, in success, and in consequences. That of *Tunis*, in particular, between Regulus and Xanthippus, calls strongly upon the attention. We are not dazzled by a long list of numerous forces and barbarous auxiliaries, fatigued by a repetition of desultory attacks and repulses, or bewildered amidst a series of complex manœuvres. Two armies, nearly equal in numbers, of small strength, but supereminent valour, headed by renowned generals, encounter on a spot of ground easily surveyed by the eye of imagination. We remark their several dispositions. The simple narrative of the historian points out clearly and satisfactorily the faults or advantages of those dispositions, the mistaken rashness of the Roman, and the consummate generalship of Xanthippus; and before we enter upon the vicissitudes of the action, we are fully convinced that the errors committed by Regulus must ultimately lead to his total defeat. Polyb. lib. i.

The march of Hannibal into Italy furnishes us with several instances of pitched battles, various in their nature, important in their consequences, and interesting in description. Far from being fatigued with following the brave Carthaginian through a continual scene of slaughter, we consider and admire his conduct, feel for his difficulties, eagerly accompany him in the field of carnage, and take a lively interest in his proceedings. The three famous engagements of the *Trebia* (Polyb. lib. iii. Liv. lib. xxi. sect. 53—56.); of the lake *Thrasymenus* (Polyb. ib. Liv. lib xxii. sect. 4—7.); and of *Cannæ* (Polyb. ib. Liv. xxii. sect. 44—52.); rising in importance one above the other, chiefly arrest our attention. We find that previous to every one of these, the arrangements made by Hannibal were such as almost to ensure success. A series of artful movements was constantly employed to draw the Romans into the snares prepared for them; and their commanders, destitute of the genius it was necessary to oppose to so formidable an enemy, rushed, as it were, blindfold upon their ruin; though possessed in each of the contests we have just named of every advantage of numbers, resources, and, we may even add, of valour. The talents of a single man reduced those advantages to nothing. Their numbers were converted into an hindrance to themselves, their resources were intercepted or rendered useless, and their valour, degenerating into despair, precipitated them madly upon certain destruction.

No action was ever more obstinately fought, or as a pitched battle deserves more consideration, than that of *Zama* (Liv. lib. xxx. sect. 32—35. Polyb. Fragm. lib. xv.), where the fortune of a Scipio finally triumphed over the Carthaginian republic. Without more than barely naming it here, we refer the reader for a more particular account of that celebrated affair, to the article ZAMA.

From this time, Roman discipline and valour reigned triumphant in every struggle with foreign nations. The armies of Antiochus, Perseus, and Mithridates, were destroyed, for the most part, with scarcely an effort; and the battles they ventured in defence of their dominions are only miserable instances of the inferiority of mere courage, supported by tenfold numbers, to the cool and steady bravery of veteran soldiers, directed and managed by the talents of an experienced general.

But however cheaply the legions of Flaminius, of L. Scipio, of P. Æmilius, and of Lucullus, had earned their laurels, a harder task was imposed on those who, under Cornelius Sylla, and Julius Cæsar, turned their arms against their own countrymen. They had to engage with troops equally courageous, expert, and strictly disciplined; with men who, under Marius and the great Pompey, had exterminated the hordes of the savage Cimbri, and had subjugated the eastern world; in a word, with Romans. Three pitched battles, those of *Pharsalia*, *Thapsus*, and *Munda*, signalized this bloody period, and gave ample scope for the exertion of the utmost talents of the matchless Cæsar. Yet in the last of these engagements, that consummate general confessed, that he contended not for victory, but for his life; a satisfactory evidence of the desperation with which it was fought. Plut. in Cæs.

The two battles of *Philippi* are equally famous. Few have been more decisive in the event, or more distinguished for the uncommon perseverance and obstinacy with which they were contested.

In the age of Tacitus, we find the military science of the Romans brought to perfection. Similar to the train of artillery which modern generals carry into the field, the army of Vitellius at *Cremona* planted its balistæ to play upon the enemy, and with showers of immense stones, swept them away by whole ranks. (Tacit. Hist. lib. iii. sect. 23.) This battle, and the subsequent storming of the adverse camp by the legions of Vespasian, give us a perfect insight into the mode of warfare as then practised. Tacit. ibid. sect. 21—33.

In the lower ages of the empire we meet with very few instances of conflicts, remarkable either for their long duration or for any celebrated manœuvres put in execution by rival generals. Nations relapsed fast, even in this destructive science, into their original barbarism. Armies were no longer composed

compoſed of troops regularly trained and inured to ſervice, but of cowardly and undiſciplined plunderers, to whom victory or defeat was alike the ſignal for diſbanding, on whoſe exertions therefore but ſmall dependence could be placed, and from whoſe ſucceſſes little or no benefit could be derived. Numbers ſoon became, as formerly, the criterion of advantage. War teemed with ſanguinary combats, productive of trifling conſequences. Courage ſupplied the place of generalſhip; fury and carnage, of diſcipline.

Never did a ſeries of pitched battles follow each other in more rapid ſucceſſion, than during the period ſubſequent to the firſt irruption of the Arabs into the more civilized provinces of Aſia. Theſe enthuſiaſtic followers of their prophet, iſſuing from a peninſula of contemptible extent when compared to the empires they ſo madly attacked, dared to match their own puny forces againſt the united efforts of the Roman and Perſian monarchies. As we accompany them in their progreſs, the moſt incredible victories crowd upon and harraſs our reflections. It is true, that among theſe engagements, ſo general, ſo bloody, and ſo deciſive, we do not find the ſlighteſt trace of diſcipline or generalſhip. A religious fury, altogether irreſiſtible, compenſated with the Arabs the want of both theſe requiſites. Aiznadin, Kadeſia, and Yermouk, are laſting monuments of Moſlem glory; but they do not convey the leaſt information to the military reader, or recompenſe in intereſt the attention he may beſtow in peruſing them.

Alike barren, dry, and unintereſting, are the details of moſt of thoſe battles fought between the time of Charlemagne and the beginning of the ſeventeenth century. Whether we peruſe the murderous annals of the Cruſades, where all Europe and Aſia ſeem mingled in reciprocal carnage; or the bloodleſs combats of the Italians in the days of Machiavel, when, after fighting a whole day, armies have ſeparated without the loſs of a man on either ſide (Machiav. Hiſt. Flor. lib. vii.); we are alike diſguſted with the want of circumſtances to excite our attention.

Creſſy, Poictiers, and Agincourt are names venerated with reaſon by every Engliſhman; but ſetting aſide any conſideration of the ſplendid carnage which attended them, and examining them in a military point of view, how little ſhall we find to extol, how much to cenſure. In all the three caſes, the Engliſh armies were brought into the moſt imminent danger by the boyiſh imprudence of their leaders, who marched them, as it were blindfold, into the heart of an enemy's country, without taking the ſmalleſt pains, either to [illegible] the neceſſary ſupplies of provisions, or to [illegible] a retreat. Not to be behind hand in imprudence, the French generals, although certain of ſtarving their antagoniſts into a ſurrender merely by an inconſiderable delay, had three times ſucceſſively the inſanity to march up and attack the Engliſh, ſtrongly and advantageouſly poſted, and on ground too where not a fourth of their own numbers was capable of acting. Untaught by experience, they loſt the three great battles by exactly the ſame fault; and in all three (the conteſted tradition of the artillery uſed at Creſſy alone excepted), we find no reaſon to commend the military ſcience of our anceſtors. Indeed, at Poictiers, the Black Prince poſſeſſed ſagacity ſufficient to line the hedges on both ſides of a narrow way with archers, for the purpoſe of annoying the French gens d'armes as they advanced through it to the attack: a ſtratagem not half ſo commendable as that of Nevil, earl of Saliſbury, at the petty ſkirmiſh of Blorcheath, in the reign of Henry VI. (Holinſhed); an affair as much ſurpaſſing Poictiers in a tactical conſideration, as inferior in the bloody liſt of the killed, and the conſequences that enſued upon it.

In proportion as we approach nearer to modern times, we view the military ſcience making faſter ſtrides towards improvement. The invention of gunpowder effected by degrees an important change in the whole art of war. The arms and order of the battalions underwent a total alteration. The cavalry, formerly the main dependence of an army, inſomuch that no perſon of family would ſerve in any other capacity than as a horſeman, became a mere appendage to the infantry, who, ſince the invention of fire-arms, have generally decided the event of battles. The muſquet and bayonet are now ſubſtituted for the pike and ſword; and armies, like fortified places, muſt be approached in form, and battered down by artillery, while the moſt complete defeat is rarely attended with worſe conſequences than the loſs of the ſurrounding territory.

About the year 1630, the entrance of Guſtavus Adolphus and his Swedes into the German empire, and the great events which ſignalized the war of thirty years, render military hiſtory more intereſting. The celebrated battles of *Leipzick* and *Lutzen*, where the firſt modern uſe was made of the column, now the chief inſtrument of the gain of victories, are remarkable epochs. On thoſe days the hard-earned laurels of Tilly and of Walſtein faded in a moment before the comprehenſive genius of Guſtavus, who, by his ſkilful diſpoſitions bought, though with his life, the title of the firſt general of his age. A ſucceſſion of heroes, Weimar, Bannier, Torſtenſon, and Wrangel, adopted and improved upon his maxims. Condé and Turenne profited anew by the example; and a ſucceſſion of victories obtained under their auſpices, rendered the arms of Louis XIV. during 50 years invincible.

On entering upon the hiſtory of the war of 1690, we are ſurprized at the rapid improvements in that part of the military art, the ſubject of the preſent article. The engagement of *Steinkirk* preſents a remarkable inſtance of the recovery of an affair judged entirely deſperate. The battle of *Landen* ſhews us an army entrenched behind a number of fortified villages, driven from all its defences, and carried as it were by ſtorm. The bayonet, uſed firſt by Catinat at the action of Marſaglia, added a new and terrible weapon of offence to the infantry, and by degrees entirely ſuperſeded the uſe of the pike. The reader will now obſerve armies more numerous and more regularly ſubſiſted than formerly, plans of attack and defence more ingenious and connected, artillery more formidable and better ſerved, and a degree of method in military operations not before practiſed.

In the war of ſucceſſion, or that which took its riſe from the ſeparate claims of the houſes of Bourbon and Auſtria to the Spaniſh monarchy, the three great battles of Hochſtedt, of Ramillies, and of Turin, immortalized by the abilities and ſplendid victories of Eugene and Marlborough, claim particular attention. To enlarge upon each under the preſent article, would treſpaſs too much on the boundaries aſſigned to us; we therefore refer the ſcientific reader to the heads HOCHSTEDT, &c. where he will find a ſuccinct account of thoſe engagements, illuſtrated by the critical remarks of an excellent military judge, M. de Feuquieres.

Of all the battles fought by Charles XII. in his nine years' war with the Ruſſian empire about the ſame period, that of Pultowa alone is remarkable in a tactical point of view. Narva, Duna, Cliſſow, &c. furniſh but ſplendid and tranſitory inſtances of ſucceſsful raſhneſs in a military madman. The battle, or rather five battles, of Leſno on the Soſſa, fought by general Lewenhaupt againſt the whole forces of the Czar, are intereſting in ſo far as they diſplay the aſtoniſhing reſources of Swediſh valour.

From a tranquillity of fifty years, hardly interrupted by the ſhort conteſt for the ſucceſſion of Poland, Europe was arouzed by the war of 1740. With wonder we behold a nation, hardly before reckoned in the number of her powers, a nation of ſoldiers, ſtart into energy; and, headed by a monarch who to the moſt conſummate generalſhip joined the qualifications rarely found in military men, of love for the ſciences, and genius for their improvement, perform the moſt aſtoniſhing and romantic exploits. It would be ſuperfluous to follow the Pruſſian hero through his career of victory and glorious diſtreſs, or to enumerate the various means and manœuvres by which he triumphed at Friedberg, at Prague, at Liſſa, at Zorndorff, and at Torgaw, over the firmneſs and diſcipline of Auſtrian forces, the talents of a Daun, and the enterprize of a Laudohn. Nor have we room to enter into details of his defeats at Kolin, Hochkirchen, and Cunnersdorff; defeats which only throw additional luſtre on his tranſcendent abilities.

It ſeemed impoſſible for human genius to ſurpaſs the bounds preſcribed by the immortal Frederic to modern tactics. His hand had modelled armies into mere machines, liable to be directed with promptitude at the pleaſure of the mover. The ſyſtems practiſed in the Pruſſian and Auſtrian ſchools, ſeemed to defy alteration or improvement; and the art of drawing up armies in order of battle particularly was reduced to certain rules, adapted to all ſituations, and which enſured every preſumptive means of ſucceſs.

A revolution, the effects of which have been ſeverely felt in the moſt remote corners of the globe; a revolution, which has ſhaken the religious and political opinions of the moſt powerful nations, arrived to overturn monarchies, to change the face of Europe, and to convert it into one vaſt theatre of war. The military art did not eſcape the general influence. When the armies of Pruſſia and Auſtria, numerous, valiant, and bred up in the ſchools of Frederic and Laudohn, poured their united forces upon the French republic, oppoſed only by raw levies, undiſciplined, half armed, and conducted by generals, many of whom knew nothing of ſervice by experience; what reſources could we ſuppoſe a nation to poſſeſs, capable of counterbalancing ſuch diſadvantages! But with amazement we view the diſciplined invaders, at the end of the firſt campaign, driven back with ſhame and defeat. We view the beſt officers in Europe in a diſgraceful retreat before mere novices in the art of war. We view enthuſiaſm ſupply the place of commanders, of numbers, and of diſcipline.

One general battle had ſubjugated Belgium to the diſpoſal of France, when the treachery of a general not only occaſioned the loſs of that country, but endangered the frontier of the republic itſelf, then covered only by a diſorganized army. Nevertheleſs, during a long and bloody campaign, the forces of almoſt the whole of Europe united ſtrove in vain to break through the firſt line of the bordering fortreſſes. The ſcene was ſoon totally changed. The collected energy of a nation, overbearing all oppoſition, repelled the attack; retaliated invaſion; and by ſeven of the moſt brilliant campaigns recorded in hiſtory, atchieved ſuch important, rapid, and extenſive conqueſts as almoſt exceed credibility.

We muſt not place to the ſole account of enthuſiaſm theſe wonderful ſucceſſes. Enthuſiaſm alone, though backed by ſtill greater numbers, muſt ultimately have proved inſufficient, when oppoſed to diſciplined troops and ſkilful generals. The art of war gradually aſſumed a new face. To the maxims of the German ſchool, others ſucceeded ſtill more prompt, more energetic, and peculiarly adapted to the nation which carried them into execution. To the excellence of their artillery, their ſkill in the art of managing the bayonet, and the incredible rapidity with which they have executed the different modes of charging in column, as well as to the extraordinary talents of their ſelf-taught generals, the French owe chiefly their ſucceſſes in the late war. Under ſome future article we ſhall hazard ſome obſervations on their mode of engaging.

In a war ſo productive of bloody and general engagements as the laſt, it would be ſuperfluous to dwell on particular inſtances. Never in one campaign did ſo many battles take place as in 1794, when from the beginning of April forwards hardly a day paſſed without ſome deſperate conflict. In point of conſequences, we muſt aſſign the firſt rank to Jemappe, Tirlemont, Haguenau, Fleurus, Milleſimo, Arcole, Marengo, and Hohenlinden; but if we only conſider the ſlaughter on both ſides, Lodi, Verona, Stockach, Novi, and Zurich ſtand pre-eminent. A few remarks upon theſe, with ſome other affairs of principal conſequence, will be found under their proper heads.

When we conſider the immenſe reſources required to maintain a large army, and the inconvenience with which the movements of more unwieldy bodies are ſtill attended, we ſhall find room to commend the leſs extenſive ſcale on which we carry on our wars, compared to that of more ancient times. Indeed the armies, which we are aſſured have been brought forth to battle in the earlier ages, almoſt ſtagger our belief. Seſoſtris is ſaid (Diod. Sic. i.) to have led 600,000 foot, 24,000 horſe, and 27,000 armed chariots, on his famous expedition into Upper Aſia. The ſame hiſtorian ſwells the armies of Ninus and Semiramis to two and three millions of men. We are told in ſcripture that Zerah, a barbarous potentate, invaded the kingdom of Judah with a million of his ſubjects, who were totally exterminated by the Jewiſh monarch Aſa; nor are the accounts of the numbers engaged at mount Zemaraim on both ſides, and the carnage of the Iſraelites on that occaſion leſs marvellous. (II. Chron.) Darius, in his Scythian expedition marched at the head of ſeven hundred thouſand of his ſubjects (Herod. lib. iii.). Xerxes invaded Greece with a fleet of more than 1300 triremes, and a land army of 2,100,000 men. According to Herodotus (lib. vii.), the whole of his ſea and land forces numbered above five millions These numbers, immenſe as they are, will hardly appear exaggerated, when we reflect on the hoſts afterwards brought into the field by the Goths and Huns, and the formidable ſwarms of Croiſes in the middle ages. The laſt Darius, when he engaged Alexander at Iſſus, muſtered in his army ſix hundred thouſand men; and ſome hiſtorians make his forces at the battle of Arbela amount to a million.

The eaſe with which theſe immenſe hoſts were defeated by comparatively trifling numbers of Greeks, gives us the moſt mean idea of their bravery and military ſkill. We muſt except the inſtance of Platæa, where the victory was obſtinately diſputed, and the carnage conſequently dreadful. There are few inſtances upon record of a battle ſo completely deciſive. Of 300,000 men, of whom the Perſian army conſiſted at the commencement of the action, not four thouſand eſcaped the deſtruction of that fatal day. (Herod. ix.)

The Romans, although they ſometimes kept very numerous forces on foot in different parts of their dominions, ſeldom employed above forty thouſand men in the ſame army. In their war with the Ciſalpine Gauls, ſubſequent to the firſt Punic, they levied between ſeven and eight hundred thouſand troops; but theſe all acted in ſeparate corps. One of the largeſt armies they ever brought into the field, was that defeated, or rather deſtroyed, at Cannæ by Hannibal. It conſiſted of 76,000 foot and 7,200 horſe, of all whom only

only about 3000 escaped death or captivity. This defeat, terrible as it was, was some years after revenged by the slaughter of 60,000 Carthaginians on the banks of the Metaurus. (Polyb. lib. ii & iii. Livy.)

We shudder at the cruelties which sometimes accompanied the triumphs of Rome over her more barbarous and undisciplined enemies. L. Scipio destroyed 50,000 Syrians at Magnesia. Marius, in his contest with the Teutones, took or exterminated above 300,000 of them. In a second battle, against the Cimbri, he slew 120,000, and captured half that number. In three battles against the generals of Mithridates, Sylla cut in pieces 200,000 men. The bloody defeats he sustained from Lucullus, during the siege of Cyzicus, cost the same Mithridates three hundred thousand of his forces. On one occasion, Julius Cæsar annihilated an army of 368,000 Helvetii; on another, he extirpated upwards of 430,000 Germans, who had crossed the Rhine in quest of new settlements. (Livy. Plut. in Mar., Sylla, & Lucull. Cæs. de Bell. Gall.)

In the civil wars of the Romans themselves, we find instances, considering the inferior numbers of the troops engaged, of slaughter equally dreadful. In the battle before the Colline gate of Rome, Telesinus, a general of the Marian faction, commanded 79,000 men against Cornelius Sylla; 12,000 of these being taken, were chiefly massacred in cold blood after the action: all the rest perished either on the field or in the flight by the swords of their implacable countrymen. In justice to Cæsar we must observe, that his triumphs over the Pompeian party were in a great measure exempt from these atrocities. (Plut. in Sylla. Eutrop.)

It is the well-founded remark of a judicious and elegant writer, that our European battles appear only as skirmishes, when compared to those which have deluged the plains of Asia with blood. (Voltaire, Essai sur l'esprit et les mœurs des nations) In the year 1218, fatally distinguished as being the epocha of the first irruption of the Moguls and Tartars into the southern provinces of Asia; the destroyer Ghengis-Khan marched to the siege of Otrar at the head of 700,000 combatants. Mohammed, the reigning sultan of Karazm, opposed him with an army 400,000 strong. The weaker party was defeated, and the Tartar conqueror commenced his sanguinary career by the destruction of 150,000 of his enemies. This first chastisement only paved the way for others still more terrible. In following the great Khan through the dreadful scenes transcribed by De la Croix from the best Eastern authorities, we are shocked at the unheard of severities exercised upon such cities as most incurred his anger by an obstinate resistance. The particulars of such tragedies would but disgust the reader. To select a few of the most remarkable instances:—At the storming of Karazm, Mohammed's capital, 200,000 persons were massacred, and half that number sold for slaves; 90,000 were shot to death with arrows in cold blood on the plains of Nesa; 1,747,000 were butchered in the two cities of Nishabûr and Tûs, and their dependencies; 1,600,000 in the district of Herat; and in the last battle fought by Ghengis Khan against the rebels of Tangut, 300,000 are reported to have perished. To dismiss this subject, the Chinese records inform us, that in the first fourteen years of the Mogul empire, the numbers of persons destroyed by Ghengis Khan amounted to the dreadful total of eighteen millions and upwards. (Petit de la Croix, Hist. de Gheng. Khan, Par. 1710. Mod. Univ. Hist. vol. iv.)

The subsequent wars of the Moguls abound with examples of almost equal enormity. In the siege of the capital of the Chinese empire by Oktay Khan, a million of people were slain on both sides. Timur Bek, who carried on his expeditions upon the same plan as Ghengis, could bring 800,000 men at once into the field, with whom he so completely defeated at Ancyra 400,000 Turks under Bajazet, that not a fortieth part escaped the common destruction. In a word, it is in Asia that war has always been waged on the most gigantic scale.

Less bloody in their conquests, and more generous in their disputes, the armies, which during the two last centuries have been set on foot by European nations, were comparatively trifling in number. The battle of Malplaquet, where 220,000 men were engaged on both sides, is most remarkable for the number of the combatants; those of Hochstedt and Prague for the destruction of the human species. At Hochstedt, the French and Bavarian army, which before the action mustered 60,000 men, was reduced to one-third of that number. The battle of Prague cost the king of Prussia, by his own confession, 18,000 of his best troops, while the Austrians lost 24,000 men.

It is with sorrow we are obliged to remark, that the carnage on several occasions, during the last unhappy contest, has been unexampled in the history of modern war. Upon the Rhine, in particular, the loss on both sides, towards the latter end of December 1793, is computed at 80,000 men.

The following concise list of the most remarkable and decisive battles which have taken place (chiefly in Europe) from the earliest ages, may not prove wholly unacceptable.

	B. C.
Marathon, between the Greeks and Persians, fought	490
Himera, in Sicily, between the Greeks and Carthaginians,	480
Platæa, Greeks and Persians,	479
Mycale, in Ionia,	479
Eurymedon,	470
In Egypt, between the Athenians and Persians,	460
Of the Assinaros, in Sicily, between the Athenians and Syracusans,	413
Cynaxa, in Persia,	400
Coronea, between Agesilaus and the forces of the Theban alliance,	394
Leuctra, where the Spartans were entirely defeated by Epaminondas and the Thebans,	371
Mantinæa,	363
Cheronæa,	338
Of the Granicus,	334
Issus,	333
Arbela, or Gaugamela, which subverted the Persian empire,	331
Of the Hydaspes, between Alexander and Porus,	327
Ipsus, in Phrygia,	301
Beneventum, in Italy, between Pyrrhus and the Romans,	274
Agrigentum, in Sicily, between the Romans and Carthaginians,	262
Tunis, in Africa, do.	255
Panormus, in Sicily, do.	251
Of the Macar, in Africa, between Hamilcar Barcas and the revolted mercenaries,	239
Trebia, in Italy, between Hannibal and the Romans,	218
Of the lake Thrasymenus, do.	217
Cannæ, do. one of the most complete defeats mentioned in history,	216
Sena, on the Metaurus, where the army of Asdrubal was cut off by Nero, the Roman consul,	207
In Spain, between Scipio and Asdrubal the son of Gisco,	206
Zama, Hannibal totally defeated by Scipio,	202
Magnesia, between L. Scipio and Antiochus,	190
Pydna, between Perseus and P. Æmilius,	168

Nepheris,

B. C.

Nepheris, decisive of the third Punic war, 147
Cirta, in Numidia, between Marius and Jugurtha, 106
Near the Rhone, where the Romans sustained a terrible defeat from the Cimbri and Teutones, 105
Aquæ Sextiæ, between Marius and the Teutones, 102
Vercellæ, in which Marius totally exterminated the Cimbri, 101
Cheronæa, between Sylla and the army of Mithridates, 86
Orchomenus, do. 85
Before the gates of Rome, between Sylla and the Samnite Telesinus, 82
Cabira, between Lucullus and Mithridates, 71
Tigranocerta, between Lucullus and Tigranes, 69
Carrhæ, Crassus defeated by the Parthians, 53
Pharsalia, between Cæsar and Pompey, 48
Philippi, 42
Actium, 31

A. D.

Bedriacum, between the legions of Otho and Vitellius, 69
Cremona, between the generals of Vitellius and Vespasian, 69
Lugdunum, in Gaul, between Severus and Albinus, 198
Chalons, between Ætius and Attila, in which 300,000 persons fell on both sides, 451
Aiznadin, in Syria, 634
Kadesia, in Fars, which subverted the empire of the Sassanides in Persia, 634
Yermûk, in Syria, where the Saracen general Khaled totally defeated the Greeks, 636
Fontenay, in France, 841
Hastings, 1066
Ascalon in Palestine, between the Croises and the Saracens, 1192
Bouvines, 1214
Otrar in Tartary, 1218
Of the Indus, between Ghengis Khan and Jalalo'ddin, 1221
Bannockburn, 1314
Cressy, 1346
Poictiers, 1356
Angouri, between Bajazet and Tamerlane, 1402
Agincourt, 1415
Towton, 1461
Bosworth, between Henry VII. and Richard III. which finished the war between the houses of York and Lancaster, 1485
Flodden, 1513
Marignano, between Francis I. and the Swiss, 1515
Pavia, between Francis I. and Charles V. 1525
Mohatz in Hungary, which decided the fate of that kingdom, 1526
S. Quintin, 1557
Nieuport, by prince Maurice over Albert, 1600
Prague, by the duke of Bavaria over the Elector Palatine, 1620
Leipzick, by Gustavus Adolphus over count Tilly, 1631
Lutzen, memorable for the death of Gustavus Adolphus, 1632
Nordlingen, where the Protestant league in Germany was totally defeated, 1634
Breittenfeld, near Leipzick, 1642
Edgehill, 1642
Rocroy, 1643
Naseby, 1645
Jancowitz, 1645
Worcester, 1651
Before Vienna, which was relieved in consequence, 1683

A. D.

Boyne in Ireland, 1690
Fleurus, 1690
Staffarda, in which the Savoyards were defeated by Catinat, 1690
Salankemen, where the Turks were totally defeated by prince Lewis of Baden, 1691
Aghrim in Ireland, 1691
Steinkirk, 1692
Landen, 1693
Zentha on the Tibisc, memorable for the total defeat of the Turks by prince Eugene, 1697
Narva, 1700
Cliffow, 1702
Hochstedt, 2 Aug. 1704
Ramillies, 12 May, 1706
Turin, 27 August, 1706
Almanza, 14 April, 1707
Pultowa, 30 June, 1709
Malplaquet, 11 Sept. 1709
Denain, 1712
Peterwaradin, 5 Aug. 1716
Belgrade, 16 Aug. 1717
Parma, 18 June, 1734
Guastalla, 8 Sept. 1734
Molwitz (the first defeat given to the Austrians by Frederic III.), 30 March, 1741
Czaslow, 6 May, 1742
Fontenoy, a memorable battle, 30 April, 1745
Friedberg in Silesia, where the king of Prussia totally defeated the Austrians, 24 May, 1745
Rotto-freddo in Italy, 31 May, 1746
Culloden, 16 April, 1746
Prague, 6 May, 1757
Kolin (the first defeat sustained by the king of Prussia), 18 June, 1757
Plassey, which laid the foundation of the future power of the British nation in Bengal and Hindostan, 23 June, 1757
Rosbach, 5 Nov. 1757
Breslaw, 22 Nov. 1757
Lissa, 5 Dec. 1757
Zorndorff (in this battle the king of Prussia totally defeated the Russians with terrible slaughter), 25 Aug. 1758
Hochkirchen, 14 Oct. 1758
Minden, 1 Aug. 1759
Cunnersdorff (the king of Prussia here sustained a complete defeat from the Russians), 12 Aug. 1759
Torgau, 3 Nov. 1760
Freyberg, decisive of the seven years' war 29 Oct. 1762
Choczim, 30 April, 1769
Foczan, 1789
Jemappe, in which the Austrians were defeated by Dumourier, and lost in consequence all their possessions in the Netherlands, 6 Nov. 1792
Tirlemont, where Dumourier was defeated by the prince of Saxe-Cobourg, and the Netherlands subsequently recovered, 18 March, 1793
Between Dietz and Louvain, fought by the same generals, with similar success, 22 March, 1793
Haguenau, 8 Dec. 1793
In the neighbourhood of Landau (the Austro-Prussian army was almost destroyed by the republican generals Hoche and Pichegru), from the 22 to the 27 Dec. 1793
Moucron (Gen. Clairfait was again defeated by Pichegru), 29 April, 1794
Fleurus (the prince of Cobourg was defeated by Jourdan. This battle ultimately decided the fate of the Netherlands), 26 June, 1794

Liege,

Liege, between Jourdan and Clairfait,	17 and 18 Sept. 1794
On the Roer between the ſame generals, (Gen. Clairfait was overthrown in both theſe actions,)	1ſt to 3d Oct. 1794
Montenotte,	10 April, 1796
Milleſimo,	17 April, 1796
Dego,	18 April, 1796
Bridge of Lodi,	11 May, 1796
Ettingen,	9 July, 1796
Near Nuremberg,	22 Aug. 1796
Caſtiglione,	15 Aug. 1796
Roveredo,	4 Sept. 1796
Arcole,	5, 6, and 7 Nov. 1796
S. Marco,	13 and 14 Jan. 1797
Before Mantua (Gen. Provera and his whole diviſion laid down their arms),	16 Jan. 1797
On the Tagliamento,	16 March, 1797
Tarvis,	25 March, 1797
Stokach,	25 March, 1799
Verona,	26 and 30 March, 1799
Magnan,	5 April, 1799
Of the Adda,	27 April, 1799
Zurich,	4 June, 1799
On the Trebia,	17, 18, and 19 June, 1799
Novi,	16 Aug. 1799
Zurich,	24 Sept. 1799
Engen,	3 May, 1800
Moſkirch,	5 May, 1800
On the Riſs,	9 May, 1800
Ulm,	21 May, 1800
Marengo,	14 June, 1800
Hohenlinden,	3 Dec. 1800

The chief view of the great commanders of modern times has been, till of late years, rather to haraſs, or ſtarve an enemy, by frequent alarms, by cutting off his ſupplies of proviſions, carrying off his baggage, ſeizing his poſts, &c. than to ſtake their fortune and reputation on the event of a day; a battle generally deciding the fate of a campaign, and not unfrequently of the war. It is therefore a rule never to venture a general action without important reaſons, or when abſolute neceſſity leaves no other choice.

Reaſons for ſeeking and engaging the enemy are, a decided ſuperiority in number or quality of forces; diſcord among the commanders of the oppoſite army, who actuated by different intereſts; an obſtinate incapacity on their part, demonſtrated by a neglect of the ordinary precautions in encamping, or on a march, the neceſſity of relieving a conſiderable place beſieged by the adverſary; an apprehenſion of the total ruin and diſperſion of an army, unleſs prevented by ſucceſs in a general engagement; an intelligence of reinforcements coming to the enemy, whoſe junction would render him ſuperior, and change the ſtate of affairs; a particular advantage obtained in ſome preceding action, which, however indeciſive, has given the enemy a ſmart check, and procured an evident ſuperiority; or in fine, the obligation of putting all to the riſk of a battle.

The moſt proper reaſons for avoiding it are; the having leſs to hope for from a victory, than to fear from an overthrow; inferiority, either in number or courage of the troops; an expectation of freſh ſuccours, or the junction of a conſiderable detachment; the impoſſibility of bringing the enemy, too advantageouſly poſted, to an engagement on fair terms, or of forcing him in his entrenchments; or the proſpect of ruining his army by temporiſing, and declining battle. See ACTION.

But a reſolution to engage being once taken, in conſequence of one or other of the reaſons above recited, the next object to be conſidered is the means of carrying it into execution with the ſtrongeſt preſumption of ſucceſs. Thoſe meaſures are partly preparatory to the affair; but the moſt important and eſſential chiefly take their riſe out of the different circumſtances of the action itſelf, and are thoſe which almoſt always determine its ſucceſs.

Preparatory to fighting, a general ſhould carefully obſerve the following particulars. He ſhould form the order of battle according to the ſtrength and quality of the troops of which his own army is compoſed, always having an eye towards counteracting the diſpoſition in which it is expected to find the enemy. The general officers ſhould be aſſigned their reſpective poſts, and copies of the order of battle carefully ſent to ſuch as have a ſeparate command, who muſt be reſponſible for its obſervation in every reſpect. All the troops muſt be perfectly armed and equipped; the proper number of cartridges diſtributed previouſly to the battle; waggons loaded with ammunition, and arms ſtationed in the rear of thoſe battalions, which, it is preſumed, will have the hotteſt fire to ſuſtain; and a freſh reſerve provided at the park of artillery; as well to give out before and during the action, if wanted, as after it is over, when there are generally many miſſing. Time, if poſſible, ſhould be allowed to the troops to reſt and refreſh themſelves, before the engagement. Phyſicians, ſurgeons, and medicines muſt be provided, and rather more in number than may be deemed barely ſufficient. The army muſt be totally diſencumbered of the heavy baggage, and the remainder lodged in a place of ſafety at ſome diſtance. The advantages of ſun and wind, however trivial, are not to be neglected. The ſoldiers ſhould likewiſe be inſpired with the deſire of fighting, and a certainty of victory; inflamed with the hope of plunder and good quarters; and the officers reminded of glory and of rewards.

Thoſe occaſions of conquering which commonly only preſent themſelves on the day of battle are, taking advantage of the ground; ſtrict obſervance of the diſpoſition already concerted, and, ſhould a correction prove neceſſary, the making of it without confuſion, and with the knowledge of all their officers, who, from their ſituations, ſhould become appriſed of it. The artillery is to be planted along the line, according to the nature of the country; and every opportunity narrowly watched of gaining an advantage, either by extending the wings to turn, if poſſible, the flanks of the enemy; or by cloſing and protecting, to draught ſufficient troops from them for a grand attack where the enemy may appear moſt feeble. Should the march to the enemy be made by night, or little probability offer of finiſhing the conteſt before dark; the word ſhould be given to the whole line before they march. If the advance is made in line, due care ſhould be taken to preſerve the equality of the wings, and the requiſite diſtance between the lines; frequent halts ſhould be made to give the artillery time to fire and load, and the ranks to recover their order. Frequent warnings, above all, ſhould be given the ſoldiers to receive the enemy's fire, and abſtain from returning it till they have drawn their adverſaries' ammunition from them: for troops who have parted with their fire will moſt infallibly give way on ſeeing an opponent advance, ready to pour in a heavy volley upon them. If, however, both parties purſue the ſame maxim, the only expedient is, to march up cloſe to the enemy, give in a general diſcharge upon them, and prevent its being returned by immediately having recourſe to the bayonet, under cover of the ſmoke, which ſeldom fails to produce an important effect.

If the advancing army, by reaſon of the diſtance it has to march, or the inequality and cloſe nature of the ground, or defiles, it muſt paſs, cannot come at the enemy in front, the approach muſt be made in a ſufficient number of columns, to admit the formation in order of battle, out of diſtance of being

ing charged when in column. The general officers who conduct these columns should also carefully observe the motions of each other, so that the heads of their divisions may at least preserve a front; and that, when arrived at the ground where the army is to deploy into line, the movement may be executed with diligence and caution, and at too great a distance to be attacked by the enemy before all the battalions are drawn up in the pre-concerted order.

The commander in chief should post himself where he may best and most conveniently remark the effect of the first charge, and whence he may with the least difficulty disperse his orders, either to sustain the troops who may have broken the enemy, or to replace such as have themselves been thrown into disorder. For both these purposes he should make use of the supernumerary forces stationed between the two lines, or of those of the reserve, as he may judge most advisable. Every other general officer should be at his particular station, either to lead to the charge, or to remedy the disorders which may arise in the brigade entrusted to his command.

If the battle becomes general and bloody, and success inclines to neither side, the commander in chief should direct his principal effort against that part of the line where the enemy's resistance is most obstinate; and in this case he should himself hasten to the spot, to animate the troops by his presence, and induce them to charge, under his eye, with greater vigour. If success is complete throughout the first line, and it entirely overthrows that of the enemy, the principal attention of the general, and of the other officers, should be employed to restrain the soldiers, prevent them from leaving their colours to follow up the flyers, and, committing the pursuit to some detached corps of cavalry and infantry, to march in good order, at a steady pace, to sustain these detachments, and assail the second line of the enemy. The artillery should always accompany the first line, in the order already distributed, in case the nature of the ground allows of it. The remainder of the army should follow the movement, always observing, without confusion, the distance between the two lines appointed by the order of battle.

Should the first line give way, or be thrown into disorder by the enemy, the battalions are to retire through the intervals left between those of the second line, behind which they are to halt and rally. Great care is here necessary to be taken by the officers, that instead of passing through the intervals, the routed troops do not directly rush in upon the ranks of the second line, and either carry them off in the general flight, or throw them into such confusion and disorder as it may be impossible to repair before the enemy are upon them.

On the first line's giving way, the second should march up briskly to its relief, and charge furiously upon the enemy without giving him time to repair the disorder into which the action and pursuit must of course have in some measure thrown him. By executing this with promptitude and determination, it is often easy to retrieve the ground which has been lost, and to defeat and render useless the enemy's first line, already considerably weakened and deranged by the former attacks. It is the sooner effected, as the enemy's fire which does most execution is thrown away; the subsequent discharges, from the great hurry of loading, being of little consequence, in comparison with the first. The great mischief is, that the second line, on seeing the first give way, are usually struck with a panic which magnifies the enemy, and on his nearer approach, either betake themselves to flight, or make but a faint resistance.

If, on the other hand, the victory still remains constant, and the adverse second line is overthrown, the general in chief should use still greater care than formerly to prevent his soldiers from dispersing, lest they should be charged and routed by the first line of the enemy, which may have retired and rallied behind their second. He should push the beaten troops, still keeping his men in good order, and in line, till their confusion is general. He must then progressively augment the number of his detached forces; without, however, once suffering any individual to quit his colours, unless commanded. It is at this moment that he should employ his reserve, and the different corps which have not been engaged, to pursue the enemy, prevent them from rallying, and, *last of all*, to make prisoners, which the men should *never* be suffered to do during the combat, or even to think of the booty, till the victory is absolutely gained, and the enemy so scattered and at a distance, as to leave no longer any fear of their turning upon the different detachments employed in the pursuit. The general may then, for the rest of the day, suffer his soldiers to collect the booty. If, in full pursuit, the detachment fall in among the enemies' baggage, they must not be suffered to disband instead of following up their advantage. Their officers must with extreme attention, severity, and even blows, if milder methods are of no avail, push them forward till they have got clear of the baggage, employ them only in taking the enemy prisoners, or cutting them down, and leave the pillage for the rest of the troops.

The first care of a general after the gain of a battle, should be to pay proper attention to his wounded, and visit, or at least send to visit, the principals among them; to learn what valiant actions have been performed in different parts of the field; and to praise in general the whole army, particularly those who most deserve it. He should collect the trophies of his conquest, such as the prisoners, colours, standards, kettle-drums, and artillery, taken from the enemy; give, without delay, a first account of his victory to his court, and follow it up by another and more circumstantial detail, accompanied by the colours and standards he has won. Then, after burying the dead, disburthening his camp of the wounded of both parties, the prisoners, artillery, and other superfluities, and suffered the army to take a little repose, in the execution of all which the least possible delay should be made, the victorious general may apply himself to derive from his success every advantage which time or place can furnish, in the execution of the plan already concerted or resolved on.

But as the fortune of war is changeable, and notwithstanding every possible precaution taken to ensure success, a defeat will sometimes happen, the whole care of a general, as well as his officers, should such an unforeseen event take place, must be exerted to prevent an entire rout. The commander should have this possibility always present to his mind. His own experience and sagacity, pointing out to him the critical moment preceding the loss of a battle, will also teach him to take all those measures proper for diminishing the disorder of a flight. A last effort may be made with such troops as yet remain unbroken, to give time to those already routed to re-assemble and rally in the rear, and thus secure an orderly retreat. A post may be occupied impregnable to the enemy; or a defile be secured through which the defeated army may pass, and re-form behind it in safety.

As the loss of the battle generally involves that of the baggage, should it accompany the troops, and almost always that of the artillery, the general should only remain in the first position to which he has retired for safety, as long as may be necessary to collect the remainder of his forces, after which he may conduct them to a fortified camp, and there repair his losses, as well with cannon and arms brought from the adjacent garrisons, as by the succours which may arrive to him. If the loss is so serious as to threaten that of some considerable place, he should throw the best of his infantry into the garrison, and keep the field with the cavalry, in order

order to incommode the enemy if he form the ſiege; or keep him in awe, and prevent him from dividing his forces, if his object is only to penetrate into the country, and lay it under contribution.

If the conqueror, on account of his loſs in the engagement, finds his infantry too much weakened to undertake a heavy ſiege; ſhould he be diſabled from attempting it for want of heavy artillery and ammunition; or ſhould he derive no other profit from his victory than that of diſconcerting his enemy's projects, remaining maſter of the open country during the reſt of the campaign, or procuring his men quarters upon hoſtile territory; the vanquiſhed general ought after the firſt retreat, to occupy a defenſible poſition in the vicinity of ſome large town, whence he may procure thoſe accommodations his defeat may have deprived him of; ſuch as, cordials and medicines for the ſick, freſh baggage in lieu of that loſt, &c. He ſhould encourage his troops, without again facing the conquerors till he has repaired his loſſes by the arrival of new ſuccours, new arms, freſh ammunition, and artillery, has cured the wounded, and finds himſelf ſtrong enough to oppoſe the enemy, and prevent his eſtabliſhment in advantageous quarters.

Bland, Military Diſcipline.—Memoire de Feuquieres, c. lxxx.

Battle was alſo a term formerly uſed to denote a body of forces drawn up in order of battle, and amounts to the ſame with what is otherwiſe called Battalion.

In this ſenſe we meet with the length or depth of the *Battle*; the front, rear, and flanks of the *Battle*.

Battle, *length of the*, is the number of ſoldiers in rank, or the ſpace from the left flank to the right.

Battle, *depth of the*, is the extent of a file, or number of men from front to rear.

Battle, *line of*. See Line.

Battle *array*, the ſame with order of Battle.

Battle, *order of*, ſignifies the diſpoſition of the ſquadrons and battalions of an army, into one or more lines, according to the nature of the ground, either for the purpoſe of engaging an enemy, or being reviewed by the general.

The Egyptians, whoſe priority in civilization and in communicating the arts to the reſt of mankind is univerſally allowed, were naturally, although they ranked many great conquerors among their firſt monarchs, a pacific nation. We have no authorities to enable us to judge of the progreſs they had made in the art of war; but from the fanciful account of the battle of Thymbra, given by Xenophon in his Cyropædia, we may fairly preſume that they uſually fought in large and deep battalions, forming a complete ſquare. On the above occation he mentions twelve of theſe unwieldy bodies, each conſiſting of ten thouſand men, and who formed the chief dependence of Cræſus againſt the army of Cyrus.

A people ſo particularly favoured and protected by heaven, as the ancient Jews, little needed the aſſiſtance of human invention, when, on any emergency, a new miracle was always ready to inſure them ſucceſs againſt their enemies. We find, therefore, nothing in the ſacred ſcriptures that can give us an idea of any order of battle obſerved among them; although the regular diviſion of their numerous forces under David, who diſtributed them into twelve main bodies according to their tribes, and each of theſe into thouſands, or regiments, into hundreds or companies, into tens, and even into threes, induces us to imagine, that they would not entirely forget ſuch miracle in the field. The Jewiſh writers, followed by the author of the "Diſſertation ſur la tactique des Hebreux," aſſirm, that they arranged their armies in one ſingle line, of conſiderable depth, ſometimes between twenty and thirty in file. Along the front of theſe were placed the light armed men, viz. the moſt expert archers, ſpearmen, and ſlingers, who began the onſet by a warlike ſhout, and with caſting thick ſhowers of darts and ſtones againſt the enemy's front, in order to cauſe terror and confuſion, and ſtop the ruſhing in of the chariots, which among the Canaanites were very numerous, by wounding the horſes and drivers. This is the more probable, as it is a method common to moſt of the Aſiatic nations. Anc. Univ. Hiſt. vol. iii. p. 184.

The order of battle deſcribed by Xenophon (Cyropædia) to have been uſed by Cyrus at the action of Thymbra, though perhaps a viſionary one as applied in the text, may ſerve to give an idea of the method generally uſed by the ancient Perſians in drawing up their armies, with which Xenophon muſt have been well acquainted. The cavalry, in the ſituation which it is indiſpenſably neceſſary for them to obſerve, were poſted on the wings. The heavy armed infantry, carrying, beſides the pike, a ſword for cloſe combat, and drawn up twelve deep, formed the firſt line. The ſecond conſiſted entirely of light armed, who threw their darts over the heads of the former, and annoyed and diſordered the enemy in their approach. The third line, deſtined to the ſame purpoſe as the ſecond, was compoſed entirely of archers; their bows which were extremely well bent and ſtrung, carrying far beyond the front ranks, ſo as to exceſſively incommode the enemy. With theſe were ſometimes intermixed ſlingers, who threw large ſtones with great effect. For this purpoſe the Rhodians afterwards ſubſtituted leaden balls. The fourth line, conſiſting of heavy armed, and ſimilar to the firſt, was intended to ſupport the preceding ones, and prevent them from giving way. It alſo ſerved as a rear-guard and a corps-de-reſerve to repulſe the enemy who ſhould penetrate ſo far. The Perſians alſo made uſe of moveable towers, erected on large carriages, each drawn by ſixteen oxen, and containing twenty men, who threw ſtones and darts. Theſe were placed in line in the rear of all the army, behind the corps-de-reſerve, and favoured the rallying of thoſe troops which were puſhed and thrown into confuſion by the enemy. They placed likewiſe great reliance in armed chariots, which they drew up ſometimes in front of the battle, and ſometimes upon the flanks, when in fear of being enveloped.

Such was the extent of the military ſcience of thoſe nations, who under Xerxes threatened Europe and the Weſt with ſubjugation. But we ſee no occaſion on which they knew how to profit by the advantage of the ground to carry the war, when neceſſary, into a difficult country, to make uſe of defiles and ambuſcades, either for the purpoſe of covering themſelves from the attacks of the enemy, or of annoying him on his march; or to protract an unequal campaign by avoiding a deciſive action with a ſuperior antagoniſt, and reducing him to diſtreſs for want of forage and ammunition. Neither do we obſerve that they paid the requiſite attention to the ſupporting of their flanks by rivers, moraſſes, or heights, when it would have been advantageous by giving them an equal front to an army much more numerous, and putting them out of danger of being ſurrounded. Rollin, Hiſt. Ancienne; liv. iv. ch. 4.

The Perſians made ſome alterations in this ſyſtem; but they were far from being judicious. Artaxerxes Mnemnon at the battle of Cunaxa, threw all his forces into one line, for the purpoſe of ſurrounding or outflanking thoſe of his brother Cyrus; but he preſerved the clumſy order of ſquare battalions, whoſe unwieldineſs rendered it impoſſible for them to take advantage of a ſucceſs with the neceſſary promptitude, to retreat with facility, or manœuvre with any effect. The diſpoſition of Mnemnon the Rhodian, in oppoſing the

paſſage of the Granicus by Alexander was leſs faulty. He formed two lines; the firſt of cavalry to aſſail and diſorder the Greeks as they attempted to gain the bank of the river; and the ſecond, at ſome diſtance, of infantry, with the intention, no doubt, of ſupporting the firſt: but, however judicious this arrangement might have been, he wanted genius or inclination to profit by it, and tamely ſuffered the Macedonians to reach the ſhore, defeat the cavalry oppoſed to them, and form their phalanx undiſturbed for the attack of his heavy-armed foot, without ſtirring from his poſition, or caſting a ſingle javelin. It is impoſſible to read, without indignation, the unſoldierlike details of the pompous march of Darius, and the extreme folly, as well as ignorance, conſpicuous in the order of battle he made his armies obſerve at Iſſus and Gaugamela. His awkward evolutions on the former occaſion, diſordered his forces before the commencement of the action. In the latter inſtance he preſerved the ruinous arrangement of his infantry by nations, in huge ſquare battalions; he intermixed them with corps of horſe no leſs unwieldy; and, not content with having committed faults ſo inexcuſable, he ſurpaſſed them both by another. The nature of the ground, not allowing his immenſe army to extend itſelf upon a ſingle front, ſeemed to point out the neceſſity of a ſecond line, or at leaſt a corps-de-reſerve. He indeed drew up, behind his centre, ſeveral immenſe battalions for which he had no room in front; but ſo cloſe to the firſt line, that when theſe gave way, the reſerve, inſtead of ſupporting, ſerved only to augment their diſorder. Againſt ſuch an enemy, it is by no means ſurpriſing that Alexander ſhould have been, with inferior forces, ſo completely ſucceſsful. Xenoph. Anab. lib. i. Arrian. in vit. Alex. lib. i. & iii.

We now turn to the Greeks, who, of all people of antiquity, the Romans excepted, were the beſt judges of warlike affairs and military conduct; but we cannot eaſily excuſe them for the overſight they almoſt conſtantly committed in the drawing up of their whole army on one front, and truſting to a ſingle effort the ſucceſs of the day. Their infantry conſiſted of two kinds of ſoldiers. The heavy armed, who carried large bucklers, lances, and ſwords, and in whom conſiſted the principal ſtrength of the army; and the archers and ſlingers who were generally diſtributed along the front of the line, and employed their ſtones, darts, and arrows, to diſorder the ranks of the enemy. Having made their diſcharges, they retired round the flanks into the rear of the heavy armed, whence they continued throwing their darts during the reſt of the action. As for the heavy armed, or Hoplites, we ſhall follow Thucydides in deſcribing their diſpoſition, according to the Lacedæmonian ſyſtem, that nation being then reckoned the moſt expert among the Greeks in military knowledge. Their battalions conſiſted of four leſſer diviſions, each conſiſting of 128 men, and ſubdivided into four others, each of 32 men. The effective force of every large corps thus conſiſted of 512 ſoldiers, who were uſually drawn up in ſmaller ones of four men in front, and eight in file. We find ſeven of theſe regiments engaged at the firſt battle of Mantinea, during the Peloponneſian War. The depth of the files was, however, often altered, when judged neceſſary by their commanders.

The Lacedæmonians never made uſe of cavalry before the Meſſenian war, on which occaſion they were convinced of the impracticability of carrying on their operations in a flat country without it. Even then they rarely exceeded the number of ſix hundred, and theſe were chiefly compoſed of the inhabitants of a little diſtrict in Laconia called Sciritis, a circumſtance from which they derived their appellation of Skirites. They were always drawn up on the left flank of the army, a poſt they claimed by right. So averſe were the Greeks in general to the uſe of cavalry, that in the moſt flouriſhing periods of the Athenian republic, they never muſtered above 1,200 in their army.

The Greek tacticians of the middle ages have exhauſted their imaginations in forming fanciful orders of battle, principally for the cavalry. Minute geometricians and theoretical ſoldiers, they have conſidered the art of war in a light entirely mechanical; and employing their pencils at random, have given us upon paper ſuch plans and diſpoſitions as only could exiſt in their own ideas, and could only originate in their ignorance of the practical part of the ſcience. It is hence we derive the rhomb, the wedge, the orbicular, oval, and angular manner of diſpoſing their forces, manœuvres perhaps of uſe in exerciſing a ſquadron, but not to be adopted in the field without imminent and inevitable danger. To form a proper eſtimation of ancient tactics, we ſhould conſult the writings of thoſe celebrated characters, who only recount what they have in perſon ſeen, and themſelves performed. Such are Xenophon, Polybius, Julius Cæſar, and Arrian. In reading them we trace the military art among the ancient Greeks and Romans to its higheſt pitch of perfection. The principal offenſive and defenſive operations of a campaign in the open country, or of a ſiege, are developed with order and perſpicuity, and the images they preſent to us are diſtinctly imprinted on our imagination. Thucyd. lib. iii.—Rollin, Hiſt. Anc. liv. x. ch. 2.—Potter. Archæol. tom. ii. lib. 3. ch. 9.—Ælian. tact. ch. 18.—Guiſchardt, Memoires Milit. in diſc. prelim.

Philip and Alexander put the laſt hand to improving the order of the Greek infantry in the creation and eſtabliſhment of their formidable phalanx. For a particular account of its formation and evolutions, we muſt refer the reader to the article PHALANX. For ſeveral ages, this was the order of battle which moſt prevailed among the nations of the then known world. The Carthaginians, the Syrians, the Egyptians, adopted its uſe. We find the generals of Mithridates employed it againſt Sylla, and the barbarous Helvetii and Germans in their conteſts with Julius Cæſar. But the difficulty of preſerving the neceſſary uniſon and order in ſo large and numerous a body; and the want of a ſecond line to ſupport it when obliged to give way, were glaring defects in its diſpoſition, and it was therefore eventually forced to give place to the more convenient and ſcientific arrangement of the Roman legion.

A Roman legion arranged in order of battle, conſiſted of thirty manipuli, of various ſtrength according to the eſtabliſhment of the legion. Suppoſing it of 5000 men, each manipulus of the Haſtati and Principes was compoſed of 140 ſoldiers;—thoſe of the Triarii only of 60; the remnant of the troops were Velites, or light armed. Livy, in deſcribing the war with the Latins, gives the following account of the ordonnance of the legion. The Haſtati, drawn up in ſeparate manipuli, formed the firſt line. The Principes, chiefly old experienced ſoldiers, were placed behind the former, but with intervals between their companies ſufficiently wide to receive the Haſtati in caſe they ſhould be obliged to retreat. The Triarii, all veterans, who beſides the ſhort ſword common to all the legionaries, were armed with long pikes, compoſed the third line; their intervals being ſo extended as to enable them to receive both the Principes and Haſtati within them without any diſorder, and ſtill facing the enemy. If therefore the Haſtati found themſelves unable to ſuſtain the charge, they retired gently within the Principes, and joining with them, renewed the combat. If theſe proved too weak for reſiſtance, both retired amidſt the Triarii, where rallying, they formed a new line, and charged with more vigour than ever.

ever. If again defeated, the battle was loſt: the Romans had no further reſource. Livy, lib. viii.—Machiavel, art. di Guer. lib. iii. ch. i.

Theſe ſucceſſive retreats are no where mentioned except in Livy as above ſtated; and prejudiced as we are in favour of the military ſcience of the Romans, we find it difficult to conceive the practicability of their execution. Livy has, in fact, much miſtaken the intention of the diſpoſition in quincunx of the ancient legion. Its ſole deſign was to enable the army to form with facility in that order of battle which the ſituation of the enemy, or nature of the ground, might render moſt applicable. At the moment which preceded the charge, the manipuli of the ſecond line, marching briſkly up into the intervals of the Haſtati, formed a continued front, ten files in depth, and equal to that of the enemy. The Triarii remained as a corps-de-reſerve. It was thus, as we ſhall incontetlably prove in our account of thoſe actions, that the Roman infantry were arranged at the *Trebia* and at *Canna*. It was thus, with ſome little variation, that they fought at *Zama*. Neither was it unuſual with them to diſpoſe their manipuli according to the principles of the column, as in the battle of *Tunis*, and that between Scipio and Aſdrubal the ſon of Giſco, in Spain. Where there was but little to fear from the impetus of the enemy, the intervals of the Haſtati were filled up by the Velites; the Principes remaining at their poſts in a ſecond line; but, oppoſed to the cloſe and heavy order of the Macedonian phalanx, a directly different diſpoſition was obſerved. The manipuli of each line, preſerving their intervals, and acting as ſeparate corps, haraſſed the enemy by deſultory attacks, obliged them to abandon their united order, in which ſituation only they were invincible, and penetrating the phalanx in every direction, obtained an eaſy triumph. Guiſchardt, Memoires Militaires, ch. iv.

As to the Velites, and in later times the archers and ſlingers, they were not drawn up in this regular manner; but diſpoſed of either before the front of the Haſtati, or ſcattered up and down among the void ſpaces of the firſt line, or finally, placed in two bodies on the wings. Theſe always began the battle, ſkirmiſhing in flying parties with the foremoſt troops of the enemy. If they were repulſed, which was uſually the caſe, they fell back to the flanks of the army, or retired through the intervals into the rear. When they retreated, the Haſtati advanced to the charge. The auxiliary forces generally compoſed the two points of the battle, and covered the whole body of the Roman infantry. As to the cavalry, it was poſted on the wings, fighting ſometimes on foot as well as on horſeback; and here we find ſome reaſon to arraign the judgment of the Romans, who never allotted a proportion of more than 300 cavalry to each legion whatever might be the nature of that country which was the theatre of the war. They made no difference between the plains of Lombardy and the mountains of Liguria; and in the Alps maintained the ſame number of ſquadrons, as in the fertile valleys of Apulia.

But the order of battle in quincunx was in proceſs of time abandoned by the Romans. The tactics of Cæſar widely differ from thoſe of Scipio and Æmilius Paulus; and the march and order obſerved by Metellus in his Numidian war againſt Jugurtha, tranſmitted to us by Salluſt, are the laſt traces we find in hiſtory of the diſpoſition which proved ſo fatal to Hannibal, to Philip, and to Perſeus. The manipuli with intervals; the three lines of Haſtati, Principes, and Triarii, differing in arms and in numbers, diſappear, and about the age of Marius, the legion aſſumes a new form. Inſtead of thirty companies, we then find it divided into ten cohorts, equivalent to our battalions, ſince they each conſiſted of from five to ſix hundred men, drawn up in a ſingle line, with a depth of eight or ſometimes nine in file. The legions of Veſpaſian, according to Joſephus, were drawn up ſix deep. This laſt arrangement continued to be obſerved without alteration during the flouriſhing ages of Rome; but as we advance nearer to modern times, we perceive their military art decline in its perfection, in proportion to the decay of their greatneſs. Under Leo and Mauritius it is as difficult to recognize the tactics, as the empire of the Cæſars. The difficulty of aſcertaining the period of theſe ſucceſſive alterations has deterred thoſe authors who have been moſt capable from undertaking the office; and finding it eaſier to ſuppoſe that Livy and Plutarch have furniſhed us with ſufficient information on the ſubject, they have concurred with thoſe writers to miſlead and perplex us. Salluſt. bell. Jug. —Cæſar.—Joſeph. de bell. Jud.—Guiſchardt, prel. diſc.

For further obſervations on the diſcipline and conſtitution of the Roman infantry, ſee the article LEGION.

For a long ſucceſſion of barbarous ages, we find nothing to intereſt us in military tactics. Imitating in a rude degree the order of battle pointed out to them by their anceſters, the weſtern nations from the fifth to the fifteenth century, fought in large bodies, divided into an indefinite number of lines or *wards*, in every one of which the infantry, inferior in ſtrength and importance of ſervice, compoſed the centre, flanked by the heavy armed cavalry, who always decided the fate of battles. It is in vain to ſearch for military ſcience in theſe periods, and we ſhall therefore paſs them over with all poſſible rapidity.

The introduction of artillery and fire-arms neceſſarily introduced an alteration in this ſyſtem. The cavalry ceaſed to be the arbiters of ſucceſs, and declined rapidly in their importance. The deſtructive effect of the newly invented engines rendered it impoſſible to avoid making a material change in the order of the battalions. Their depth was gradually decreaſed. The method of engaging in wards was aboliſhed, as expoſing numbers of troops to be ſacrificed without occaſion; and two lines with a corps-de-reſerve were in time thought quite ſufficient for the purpoſe of action. The front of the army was proportionally extended, and embraced a greater extent of country. The advantages of ground, before judged in compariſon trivial, were now eagerly ſought after. Generals became from neceſſity tacticians, and by little and little, continually improving, ſometimes ſlowly, ſometimes with rapidity, the military art aſſumed the face it wears in our times; under the auſpices progreſſively of a Guſtavus, a Condé, an Eugene, a Marſhal Saxe, and a Frederic the Great, whoſe names will never be forgotten by the lateſt poſterity.

Under the articles COLUMN and LINE, to which they of right belong, we ſhall attempt to illuſtrate and compare the French and Pruſſian ſyſtems of the order of battle as now practiſed by both theſe nations; and accompany them with inſtances from among the number which have of late years fallen under our inſpection.

BATTLE, in a *Naval* ſenſe, denotes an engagement between two fleets, ſquadrons, or even ſingle ſhips. See ENGAGEMENT. The ancients had divers forms of ſea-battles; as the half-moon, circle, and forceps. In all theſe, not only the ſhips engaged each other, and by their beaks and prows, and ſometimes their ſterns, endeavoured to daſh in pieces, or overſet and ſink each other, but the ſoldiers alſo annoyed the enemy with darts and ſlings, and, on their nearer approach, with ſword and ſpears, boarding each other by laying bridges between the ſhips.

By way of preparation they took down their ſails, and lowered their maſts, and ſecured whatever might expoſe them to the wind, choofing rather to be governed by their oars.

Battle, *Line of.* See Line.

Battle, *Square.* See *Square* Battalion.

Battle, *Attainder by.* See Attainder.

Battle *royal*, in *Cock-fighting*, denotes a fight between three, five, or ſeven cocks all together; ſo as that the cock which ſtands longeſt gets the day.

Battle-axe, an ancient military weapon, which, at different periods, formed a principal part of the offenſive armour.

Homer never aſcribes this weapon to any but the barbarians, for the battle-axe was not uſed in war by the politer nations. Euſtathius tells us, it was the favourite weapon of the Amazons. The only inſtance where Homer has placed it in the hands of a warrior occurs in the thirteenth book of the Iliad, when Piſander fights Menelaus; it is there called Αξινη, and is deſcribed with ſingular minuteneſs.

ὁ δ' ὑπ' ἀσπίδος εἵλετο καλὴν
Αξινην εὐχαλκον, ἐλαΐνῳ ἀμφὶ πελέκκῳ,
[illegible] l. 611.

The Πελεκυς, mentioned in the fifteenth book, l. 710, was perhaps not very different:

Αλλ' οι γ' εγγυθεν ιςαμενοι, ἐνα θυμον εχοντες;
Οξεσι δη πελέκεσσι, καὶ αξινησι μάχοντο.

Something of this kind, it ſeems, was in uſe among the Bactrians, when they attended Xerxes' expedition: beſide bows and arrows, we are told they were armed with a ſort of hatchet, called Sagaris: (Herodotus, Polymnia lxiv.) The Lycians had axes and daggers: (Ibid. xcii.) and the Egyptians huge battle-axes.

At the ſiege of the Roman capitol, by the Gauls under Brennus, we find one of the moſt diſtinguiſhed warriors armed with a battle-axe (Plut. Camillus): and Ammianus Marcellinus, many centuries afterwards, deſcribing a body of Gauls, furniſhes them all with battle-axes and ſwords. From Tacitus, it ſhould ſeem, the ancient Germans had clubs, but no ſuch weapons as thoſe we are ſpeaking of: and the only inſtance in his writings where *ſecuris* occurs as an implement of combat, is where the Othonians are particularly deſcribed as ſtriking on the helmets of their antagoniſts with their axes. (Taciti Hiſt. II. xlii.) In ſhort, it was even then never uſed but among the Roman auxiliaries.

The introduction of the battle-axe into this country has been frequently attributed to the Danes; but proofs of its earlier uſe among us are not wanting, and there are inſtances known where it has been found even among the ſepulchres of the ancient Britons. Mr. Rooke, in the Archæologia of the Antiquary Society (vol. x. p. 113.) has deſcribed a fragment of an ancient battle-axe found among ſome Druidical remains in a barrow at Aſpatria in Cumberland, June 1789. And in the ſame volume (pl. xl.) are two repreſentations of the old Galwegian bill, or battle-axe, found in a moſs near Terreagles, the ſeat of Marmaduke Maxwell Conſtable, eſq. of Nethdale in Ireland. Others have been found among the barrows on the downs of Wiltſhire, and in the north of Scotland.

That it was uſed in the early Saxon times, we have the authority of ſeveral manuſcripts of the ninth century; and the French writers have recorded a particular inſtance of its uſe in France, ſo far back as the year 510. Clovis, they ſay, bribed the miniſters and captains of Ragnacharius to deliver up both him and his brother: and when the priſoners were brought before him, he firſt reproached them for ſuffering themſelves to be chained, and then diſpatched them with his battle-axe. See Greg. Turon. l. ii. c. 42.

The battle-axe, however, was more uſed by the Danes than any other of the Northern nations: and they were, in courſe, more expert with it. At the battle of Stamford, Oct. 24, 1066, between Harold king of England, and Harold Harfager of Norway, when the Norwegians were obliged to retire, and the Engliſh begun to purſue them with great eagerneſs, a total ſtop was put to their purſuit for ſeveral hours by the deſperate boldneſs of a ſingle Norwegian, who defended the paſs of Stamford-bridge with his battle-axe; he killed more than forty of the Engliſh, and was himſelf ſlain only by ſtratagem. (Hen. Hunt. l. vii. p. 211.) The battle-axe principally in uſe among the Anglo-Saxons appears to have been the *bipennis*, or double-edged axe; the *giſarma* is ſuppoſed to have been the bipennis with a longer handle or halbert: and the *pole-axe*, with an edge on one ſide, and a ſharp point on the other, probably came in with the Normans.

During the middle period of our hiſtory we read but little of this weapon, though the Welſh infantry at the battle of Agincourt, 1415, found it particularly ſerviceable in diſpatching thoſe whom the archers had wounded with their arrows. One of the laſt inſtances of its effectual ſervice was at the battle of Tewkſbury, during the quarrel of the Roſes, when the duke of Somerſet clave lord Wenlock's head.

Towards the ſixteenth century, it ſeems to have been gradually diſuſed, though one inſtance occurs where a piſtol placed in its handle beſpeaks a wiſh in the warriors of that period to improve its uſe. (See Arms.) It was perhaps moſt ſerviceable when our knights were completely caſed in armour; and has ſince degenerated into the halbert or partiſan.

BATTLEMENTS, in the *Military Art*, indentures, or notches in the top of a wall, parapet, or other building, in form of embraſures, for the ſake of looking through them, &c. much affected in the old fortification.

BATTOCHES, or Battogues. See Battacks.

BATTOLOGY, from βατλος, *battus*, *babbler*, and λεγω, *I ſpeak*, in *Grammar*, a multiplying of words without occaſion, or a needleſs and ſuperfluous repetition of the ſame words, or things.

BATTONI, or Batoni, Pompeio, in *Biography*, an eminent Italian painter of the Florentine ſchool, was born at Lucca in 1708. He was the ſon of a goldſmith, and brought up to that buſineſs; but diſcovering a ſtrong predilection for painting, he was ſupported in the Roman ſchool by a ſubſcription; and at Rome he employed himſelf in ſtudying the antique, and copying the works of Raphael, and likewiſe in forming a ſtyle of his own, from a diligent obſervation of nature. Having diſtinguiſhed himſelf both as a deſigner and a colouriſt, he was engaged in the execution of many important works, and painted altar-pieces and other pictures for various churches in Rome, Milan, Breſcia, Lucca, Parma, Meſſina, and other cities; as well as hiſtory-pieces for private perſons. One of his moſt admired works, is a holy family, purchaſed for a large ſum by the grand duke of Ruſſia. Battoni, however, acquired his principal fame as a portrait painter. Beſides three popes, he painted ſeveral of the Imperial families of Auſtria and Ruſſia. In recompence for a picture, which commemorated the interview of the emperor Joſeph with his brother at Rome in 1770, he received ſeveral magnificent preſents; and he, with all his male iſſue, was ennobled by the emperor. By the beautiful daughter of the ſurveyor of the Farneſe palace, whom he married in early life, he had ſeveral children; and two of his daughters were highly celebrated for their taſte and proficiency in muſic. As to his character, he was ſimple and modeſt, ſincere, friendly, and charitable; much attached to religion, and very aſſiduous in the exerciſe of his profeſſion. He ſeldom appeared in public, preferring a retired life, partly on account of the defects of his education, and partly by reaſon of the awkwardneſs of his figure, which approached

proached to deformity. As a painter, he acquired eminence by the native force of his genius; and he had no rival but Mengs, who surpassed him in knowledge and learning, whilst he was inferior to him in natural talents. Battoni, having completed his 79th year, died in 1787. Pilkington. Biog. Dict.

BATTOON, or BATOON. See BASTON.

BATTORY, a name given by the *Hans Towns* to their magazines or factories abroad: the chief of which are those at Archangel, Novegorod, Berghem, Lisbon, Venice, and Antwerp.

BATTOW, in *Geography*, a village on the west coast of Africa, S. E. from Cape Cavallos, on the west side of a small river opposite to Zeno, or Swino, on the east side. About half a league east, are two rocks lying under water, and the breakers over them are seen at sea at the distance of a league, and serve to point out the Cape and Road. N. lat 5°. W. long. 8° 30'.

BATTRE LA MESURE, Fr. to beat time, in *Music*. There are various ways of marking the measure and accents in music: by dividing each bar into 2, 3, or 4 equal parts with the motion of the hand, the foot, a *baton*, or a roll of paper. In common time of 2 minims or 2 crotchets in a bar, called *binary* measure, the hand is merely moved down and up. In time of 4 crotchets in a bar, the French frequently mark each portion of it, by *beating* the hand down to the first crotchet, moving it to the left for the 2d, to the right for the 3d, and lifting it up for the last. In triple time, or *ternary* measure of 3 minims, 3 crotchets, or 3 quavers, it is usually beaten, 2 down and one up, or the 1st down, the 2d to the left, and the 3d up.

The beating time is of great antiquity. The ancient Greeks had various ways of regulating the accents of song, and steps of the dance. See RHYTHM and GREEK MUSIC.

The Italians often beat the two first portions of a bar, and lift the hand up for the rest, both in common and triple time.

At the Opera, concert-spiritual, and even at private concerts (formerly) there was a person at Paris, armed with a truncheon (*Baton de Mesure*) like a general, whom Rousseau, in his Dictionary, ridicules, and says that he had been very aptly called the *Bucheron*, or wood-cutter; though when he wrote his musical articles for the *Encyclopedie*, the Italians and other nations, still had a *Corifa* to regulate the measure in the numerous bands employed in their churches when there was a *gran Funzione* in celebration of some saint or holy time. But it was in England at the Commemoration of Handel in Westminster-abbey, that, in the most numerous band that ever was assembled in modern times, a Coryphæus was first dispensed with. See TIME, MEASURE, ARSIS & THESIS, BAR, ACCENT, & BATTUTA.

BATTUS, LEVIN, in *Biography*, was born at Ghent, about the year 1540; but his father being obliged to remove to Rostock, on account of the troubles about religion, when he was only ten years old, he was put under the best masters that place could afford, and he so well profited by the instruction he received, that in 1559 he was appointed teacher in mathematics. In this office he continued until the year 1565, when the country being at once afflicted with war and the plague, he went first to Padua, and then to Venice, where he was admitted doctor in medicine. Returning to Rostock, he practised medicine with so much success and reputation, that he was appointed professor in that science, in which post he died, April 1591. Some small medical tracts, left by him in manuscript, were published in the Miscellanea of Henry Suretius, at Frankf. 1611, 8vo. His son, Conrad Battus, following in the steps of his father, returning from his travels, took the degree of doctor in medicine at Basle, in 1604, but falling down stairs, at his brother's house at Rostock, soon after his return there, he received a wound in his groin, from a knife he had in his pocket, which occasioned his death. He also left some short essays on medical subjects, which were published with his father's, in the Miscellanea.

BATTUS, CHARLES, a Flemish writer of some eminence, who flourished about the end of the 16th century, published in 1598, a translation of the works of Guillemæau, into his own language, folio, Dordretch, and in 1615, the works of Ambrose Para, folio, Amsterdam, with numerous plates engraved on wood; also a manual for surgeons, with a treatise on wounds of the head, from Hippocrates, 12mo. Haller. Bib. Chirurg. Eloy. Dict. Hist.

BATTUS, in *Ecclesiastical History*, an order of penitents at Avignon, and in Provence, whose piety carries them to exercise severe discipline upon themselves, both in public and private.

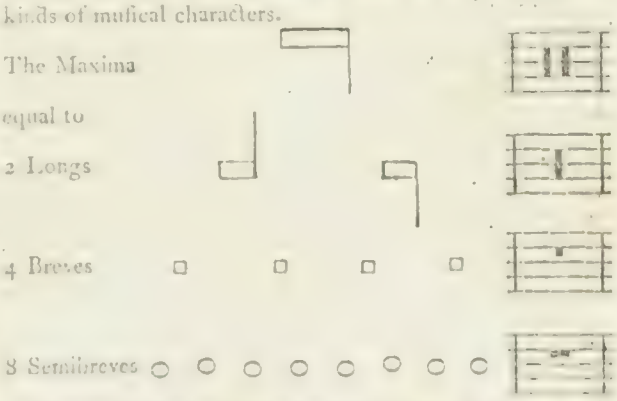
BATTUSZANI, in *Geography*, a town of European Turkey, in the province of Moldavia, 44 miles N.N.W. of Jassy.

BATTUTA, Ital. a bar in *Music*, or those portions of a musical composition, where the time is *beaten*, or marked, with the hand or foot. The Crusca dictionary defines *battuta*; quella misura di tempo che dà il maestro della musica, in *battendo* a' cantori. Varchi, who died in 1566, and who is quoted in the Crusca as authority for the use of this term, says; quanta noia, e fastidio n' apportino coloro agli occhi, e agli orecchi, i quale che non ballano a tempo, o non cantano a *battuta*. What pain and uneasy sensations do those give us, who neither dance nor sing in time!

Amendue parlarino in rime, canzoni, e altre spezie di dire con *misura* di piede, e di tempo sillabitati. Both pronounced in rhyme, songs, and other species of poetry, in measured feet, and poetical numbers. This passage is cited from a MS. of 1400.

It is not easy to imagine how music, in many parts, could be composed *in score*, with bars or vertical lines drawn through them all, whence the term *score* was derived; nor what kind of bars could contain the quantity of a *maxima*, equal to eight semibreves, unless we suppose that semibreves were sung or played as quick as quavers are now. See TIME, ACCENT, ARSIS, and MEASURE.

The most ancient kind of time-table that has occurred in the course of our researches, consisted of only four several kinds of musical characters.



Among Italian musicians, we frequently find the words *a battuta*, which import *in time* or *measure*, after recitative or an "ad libitum." Accordingly, *a* in the Italian musical language, when it precedes a substantive, has the power of *in*.

BATU-PURUDAN, fluctus lapidei (*Valent.*) in *Natural History*, one of the synonyms of MADREPORA LABYRINTHICA. *Gmel.*

BATUA, *Butua*, *Butkoe*, or *Butkoue*, in *Ancient Geography*, a town of Dalmatia, now BUDOA, which see.

BATUA, in *Geography*, a kingdom of Africa, in the empire of Monomatapa, extending from the mountains of the

the Moon to the river Magnico, whose prince is a vassal of the emperor. It is famous for its gold mines.

BATUDA, a method of fishing mentioned in some *Middle Age Writers*, wherein the fish are driven by beating the water with poles, till flocking into one place, they are the sooner caught.

BATUECAS, Los, in *Geography*, a people of Spain, in the kingdom of Leon, and diocese of Coria, inhabiting a valley called "the valley of the Batuecas," encompassed by mountains that are almost inaccessible, between Salamanca to the north, Coria to the south, the river Tormez to the east, and the rock of France to the west. These people are supposed to be the remains of the ancient Goths, who took refuge in this valley among high mountains in their escape from the Moors. Others say, that their ancestors were ancient Spaniards or Iberians, who retired hither at the time of the invasion of the Goths. They are distinguished by their barbarism and rusticity to such a degree, that the Spaniards proverbially denominate an uncivilized person, one who comes from the valley of Batuecas.

BATURIN, a town of the Ukraine, on the river Desna, belonging to the Russians, and situate in the district of Neschin, which forms a part of Lesser Russia. It was destroyed by the Russians in 1708; but the castle has been twice rebuilt, and the town in some degree repaired.

BATUS, in *Entomology*, a species of Cerambyx, found in India and South America. The thorax is wrinkled and spinous: wing-cases bidentated: antennæ long, with hooked prickles. *Linn.* This is Capricornus niger. *Mus. Petrop.*

BATUSABER, in *Geography*, the capital of the kingdom of Yohor, in the southern extremity of the peninsula of Malacca, situated about 6 leagues from the sea, on the river Yohor or Jor, in a marshy situation, so that its small wooden houses are raised upon poles about 8 feet from the ground.

BATZ, or Batzen, in *Commerce*, a copper coin mixed with some silver, and current at different rates, according to the quantity of alloy, in many parts of Germany and Switzerland.

B. AV. See Character.

BAVANY, or Bowany, in *Geography*, a river of Hindoostan, which runs into the Cavery, 7 miles north of Erroad in Coimbetore. N. lat. 11° 25′. E. long. 77° 50′.

BAVARIA, Circle of, called *Bayern* by the Germans, one of the circles of Germany, derives its name from the duchy of Bavaria, which is the most considerable part of it, and is bounded on the east by Austria and Bohemia, on the south by Carinthia and Tyrol, on the west by Suabia and Franconia, and on the north by the Upper Palatinate, which, if considered as belonging to it, verges towards Upper Saxony. The dominions of the elector of Bavaria and the Palatinate, for these electorates are united, are computed to contain 16,176 square miles, and 1,934,000 inhabitants. Hoeck estimates Bavaria at 1,339,900, and the Palatinate at 305,000. See Palatinate. Busching distributes the 20 states of the circle of Bavaria into ecclesiastic and laic. To the former he refers the archbishopric of Saltzburg, the bishoprics of Freisingen, Ratisbon and Passau, together with the priory of Berchtolsgaden, and the abbies of St. Emeran, Lower and Upper Munster, all which three lie in the city of Ratisbon. The latter are composed of the electorate of Bavaria, the duchies of Neuburg and Sulzbach, the landgravate of Leuchtenberg, the princely county of Sternstein, together with the counties of Haag and Ortenburg, and also the lordships of Ehrenfels, Sulzburg, and Pyrbaum, Hohenwaldeck, Brieteneck, and the imperial city of Ratisbon. Of this circle, the elector of Bavaria, and the archbishop of Saltzburg, are joint summoning princes. The diets, though usually held at Ratisbon, are sometimes summoned to Wasserburg, Landshut, and Muldorf. When the military force of the empire, in time of peace, was settled in 1681, at 40,000 men, the number required to be furnished by this circle was 800 cavalry, and 1494 infantry; and towards the 300,000 florins granted in 1707, it paid 18,252 florins, 9 kruitzers. The elector of Bavaria is the military commander of the forces of the circle.

Bavaria is part of the Rhætia Vindelicia and Noricum of the ancients, and is supposed to have derived its name from the Boii, a warlike people that migrated from Gallia Celtica, crossed the Rhine, and first settled in Bohemia. About the time of the emperor Augustus, they were expelled the country by the Marcomanni, and removed into Noricum; and their settlement was called "Bojer" or "Bayerland:" in Latin, "Bojaria," or "Bajoaria," whence, in process of time, was formed Bavaria. In the 6th century, when the empire of the Franks was divided among the four sons of Clovis, Bavaria became subject to the dominion of the Austrasian kings, and was governed by dukes. In the 9th century, princes of the Francic family assumed the style of kings of Bavaria, while Lieutpold in 889, was the first duke; and his progeny extend to the present day, though interrupted in 946, when, Berthold dying without children, the emperor Otho gave Bavaria to his brother Henry of Saxony. In 1071, Welph, son of Azo of Este, became duke of Bavaria, which, in 1138, passed to the house of Austria; but in 1154, it reverted to the house of Welph, in the person of Henry the Lion. In 1180, it finally returned to the first family, by the succession of Otho of Wittlebach, a descendant of Arnulph, second duke of Bavaria, A.D. 907. After the family had been unjustly deprived for more than two centuries, the Palatinate and Bavaria have recently been inhabited by a branch of the family of Deux Ponts, the son of the elector being now nominal duke of Deux Ponts.

Bavaria, *Duchy* or *Electorate of*, comprehends the greater part of the circle, and is divided into Upper and Lower Bavaria, and the Upper Palatinate. The length from north to south is somewhat interrupted, but may be about 150 British miles, and the breadth about 120. The duchy is bounded on the north by Bohemia and the Upper Palatinate; on the east by Austria, and the bishoprics of Saltzburg and Passau; on the west by the duchy of Neuberg, the marquisate of Burgau, and the bishopric of Augsburg; and on the south by the county of Tyrol, and the bishopric of Brixen. Upper Bavaria is, for the most part, mountainous, cold, and barren, producing little corn and less wine; but it is covered with forests, interspersed with large and small lakes, and abounds in cattle, wild fowl, game, baths, medicinal springs, and salt works. It is also enriched with mines of silver and copper, lead and iron. It has also many quarries of marble. Lower Bavaria, being much more level, is more fertile, and produces plenty of grain, pasturage, and fruit. The mountains of Upper Bavaria may be considered as branches of the Alps. The chief rivers of this duchy are the Danube, the Iser, the Inn, the Lech, the Nab, the Atmuhl, and the Regen. Its large inland lakes are 16, and its smaller ones 160. Render, in his "Tour through Germany," (Vol. ii. p. 290.) reckons 33 cities, besides Munich the capital, 80 market towns, 8000 villages and hamlets, 39,949 taxable farms, 12,000 solitary houses, 6000 uninhabited farm-houses, 180,000 hearths, 3,050 churches, 548 chapels, 908 parishes, 12 collegiate foundations, and 142 convents. Upper Bavaria is divided into two governments or regencies; that of Munich, and that of Burkhausen. The principal towns of the former are Munich, Pfaffenhausen, Abensperg, Ingolstadt, Donawert, Friedberg, Landeberg, Weilheim, Tolz, Wasserburg, Traunstein, and Reichenhall. Those of the latter, are Burkhausen, Oetting, Trosburg, Braunau,

Braunau, Uttendorf, Friburg, Ried, and Scharding. Lower Bavaria is alſo divided into two governments; that of Landſhut, comprehending, beſides other towns, Landſhut, Œrding, Dingelſing, Teiſbach, Hals, Rottenburg, Moſburg, and Ortenburg; and that of Straubing, the chief places of which are Straubing, Pogen, Cham, Kelheim, Stadt-am-Hoff, and Deckendorf. The ſtates of the duchy conſiſt of the clergy, nobility, and burgeſſes, of which a committee aſſembles at Munich whenever it may be neceſſary: but before the acceſſion of the houſe of Deux Ponts, the adminiſtration had become the moſt lethargic of any in Germany; and on this account the political importance of Bavaria has, in ſome meaſure, declined; and in the dangerous conflict that has ſubſiſted, and may ſtill ſubſiſt between France and Auſtria, it may be difficult for this power to preſerve a ſhadow of independence. By the fifth ſecret article of the treaty of Campo Formio, October 17, 1797, the French republic engages to employ its influence, that his majeſty the emperor ſhall receive the archbiſhopric of Saltzburg, and that part of the circle of Bavaria which lies between the archbiſhopric of Saltzburg, the river Inn, Salza, and Tyrol; including the town of Waſſerburg, on the right bank of the Inn, with an arrondiſſement of 3000 toiſes.

The eſtabliſhed religion of Bavaria is the Roman catholic; and no other is even tolerated: and thus the ſpirit of induſtry is very materially checked and reſtrained. The clergy, both ſecular and regular, are very rich; but the peaſants are wretched in the extreme, their chief ſubſiſtence ariſing from the herds of ſwine that are fed on acorns and crabs in the woods and foreſts. The regular military force is eſtimated at 12,000. The principal manufactures of the country are thoſe of coarſe woollen cloth, ſilk and woollen ſtuffs, velvet, tapeſtry, ſtockings, clocks, and watches. The principal exports are wheat, cattle, wood, ſalt, and iron. Beſides the mines of ſilver and copper near Podenmais, in the bailliage of Viechtach, and of lead at Reichenthal, the chief mineral riches of Bavaria conſiſt in the ſalt ſprings at Traunſtein, which pervade mountains of ſaline earth, like thoſe at Hallein, in the archbiſhopric of Saltzburg, and occupy many people in productive induſtry. There are other ſprings at Reichenthal. Theſe latter ſprings are 20 in number; but ſalt is only made from 4 of them: for which purpoſe part of the water proceeding from them is conveyed by pipes to the cauldrons at Traunſtein, which is about 3 leagues diſtant. The ſalt annually made from theſe ſprings amounts to 250,000 quintals.

The title of the elector is "By the grace of God, duke of Upper and Lower Bavaria, as alſo of the Upper Palatinate; Palſgrave of the Rhine, arch-ſteward of the holy Roman empire, and elector and landgrave of Leuchtenberg." He has 5 hereditary officers, *viz.* a maſter of the houſhold, a ſteward, marſhal, cup-bearer, and huntſman. The Bavarian order of St. George was revived in 1729, by the elector Albert. The knights of the order are ſtyled "defenders of the immaculate conception of the bleſſed Virgin Mary," and are required to produce unqueſtionable proofs of the nobility of their anceſtry for 8 generations in both lines. The elector is grand maſter; and its enſign is a croſs, enamelled blue, with a St. George in the middle; on the reverſe of which is the name of the reſtorer of the order in a cypher ſurmounted with the electoral cap, and bearing at the 4 angles the letters I. V. P. F. which ſignify "juſtus velut palma florebit," *i. e.* the righteous ſhall flouriſh like a palm-tree. The croſs is worn pendent to a broad ſky-blue ribbon, with a black and white border. The elector has the fifth ſeat in the electoral college, and ſeveral votes at the diets, both of the empire and the circle, in the colleges of the princes and counts. His ordinary revenue, including the tolls on all the veſſels which paſs up and down the Danube, and other navigable rivers, with that which ariſes from the monopoly of corn, ſalt, beer, tobacco, and mines, together with his own domain, is ſuppoſed, by ſome, to amount to 700,000l. per ann. Buſching and baron Reiſbach eſtimate it at 800,000l. Render at 1,031,250l. and others at 1,166,600l.

The Bavarians are little diſtinguiſhed in literature; but they are a vigorous race, adapted to the fatigues of war. They have, however, an univerſity at Ingolſtadt, and an Academy of Sciences at Munich. Baron Reiſbach (Trav. i. 107.) gives a very unfavourable account of their corporeal form and general diſpoſition and character. The characteriſtic of a Bavarian, he ſays, is a very round head, a little broad chin, a large belly, and a pale complexion; ſo that many of them appear like caricatures of men! They have large fat bellies, ſhort clubbed feet, narrow ſhoulders, a thick round head, and ſhort necks; and they are heavy and awkward in their carriage. But the women are, in general, extremely beautiful, well ſhaped, of clear tranſparent complexions and much more lively and graceful in their geſtures than the men. The chief ornament of the men is a long broad waiſtcoat, ſtrangely embroidered, from which their breeches hang low and looſe. The women diſguiſe themſelves with ſtays in the ſhape of a funnel, covering the breaſt and ſhoulders, and hiding the whole neck. He ſays, that no pen can deſcribe the ridiculous mixture of debauchery and devotion, which is exhibited every day; and he adds, that the propenſity to feaſting, indolence, and beggary, which prevails in Bavaria, is countenanced and ſanctioned by the example of the prieſts. Indolence, he ſays, is the prevailing character of the Bavarians: and Bavaria well deſerves the character given of it by an officer of Gaſcony, of being the greateſt brothel in the world. With their indolence, intemperance, and devotion, they unite, according to his account, a certain ferocity of temper, which often occaſions quarrels, mutual abuſe, and ſcenes of blood. The Bavarian peaſant, ſays this writer, is gruff, fat, dirty, lazy, drunken, and undiſciplined; but he is brave, economical, patriotic, and ſuch a ſlave to his word, that when it has once been given, it is never violated. Conſiderable benefit, however, has been derived from the laudable plans for deſtroying mendicity and encouraging induſtry, propoſed and carried into effect at Munich by count Rumford. See MUNICH.

By the plan of indemnities, agreed upon between the Firſt Conſul of France and the emperor of Ruſſia, in purſuance of the 7th article of the treaty of Luneville, it was agreed to propoſe that the indemnities to the archduke, grand duke, ſhould be for Tuſcany, and its dependencies, the archbiſhopric of Saltzburg, the provoſtſhip of Berchtolſgaden, the biſhopric of Trent, that of Brixen, and part of that of Paſſau, ſituate beyond the Iltz and the Inn, on the ſide of Auſtria, except the ſuburbs of Paſſau, with a radius of 500 toiſes, and the abbeys, chapters, and convents, ſituate in the abovementioned dioceſes. Theſe principalities were to be taken out of the circle of Bavaria, and incorporated in the circle of Auſtria, and their eccleſiaſtical juriſdictions, both metropolitan and dioceſan, were to be alſo ſeparated by the limits of the two circles; Muhldorf to be united to Bavaria, and its equivalent in revenue taken from thoſe of Freiſingen. To the elector Palatine of Bavaria were to be aſſigned, for the duchy of Deux-Ponts, the duchy of Juliers, the palatinate of the Rhine, the marquiſate of Berg-op-zoom, the ſeignory of Rauenſtein, and others ſituate in Belgium and Alſace; the biſhoprics of Paſſau, with the reſervation of the part of the archduke; of Waltzbourgh with the reſervations herein-above mentioned; of Bamberg, of Aichſtadt, of Freiburg, and of Augſburg; the provoſtſhip of Kempten; the imperial

perial cities of Rothenbourgh, Weiſſenbourgh, Windſheim, Schweinfort, Gochſheim, Sennefelt, Allthouſen, Kempten, Kauſbeuren, Memmingen, Dinkelſbuhl, Nordingen, Ulm, Boſsfingen, Buchorn, Waugen, Leutkirch, Ravenſbourgh, and Alſchſhauſen: the abbeys of St. Ulric, Itſee, Wengen, Soeflingen, Elchingen, Urſburg, Rochenbourgh, Weltenhauſen, Ottobeuren, Kaiſerſheim. By the treaty of Preſburg, 26 Dec. 1805, the electorate (now the new kingdom) of Bavaria acquired the margraviate of Burgau and various other territories.

BAVARIA, *Palatinate of.* See UPPER PALATINATE.

BAVAY, PAUL, *Ignatius De*, in *Biography*, born at Bruſſels in 1704, applied himſelf early, and excluſively, to the ſtudy of chemiſtry, in which his father had waſted a conſiderable patrimony. At length, in 1735, he went to Lovain, where, at the end of two years, he was admitted Doctor in Medicine. He now returned to Bruſſels, and acquired ſo much reputation by his ſucceſs in his practice, that, in 1746, when the French were in poſſeſſion of the city, he was made phyſician to the military hoſpital there. In 1749, the French having evacuated Bruſſels, he was appointed Demonſtrator in Anatomy, but being oppoſed by the principal phyſicians, and his practice condemned, probably on account of his profeſſing to cure ſome diſeaſes by a noſtrum of his invention, he went to Dendermond, where he continued for ſome time. Returning again to Bruſſels, he died there, Feb. 20, 1768. His works are, "Petit Recueil D'Obſervations en medecine ſur les vertus de la confection tonique, reſolutive et diuretique," Bruxelles, 1753, 12mo. "Methode courte, aiſee, peu couteuſe, utile aux medecins, et abſolument neceſſaire au public indigent pour le gueriſon des pleuſieurs maladies." Bruxelles, 1759, 12mo. The principal ingredients in his medicine, are ſaid to be ſquills and Florentine orris. Eloy. Dict. Hiſt.

BAVAY, in *Geography*, a town of France, in the department of the North, and chief place of a canton in the diſtrict of Aveſnes. The place contains 1455 and the canton 9266 inhabitants: the territory includes 145 kiliometres and 20 communes. N. lat. 50° 25′. E. long. 3° 45′.

BAUBEE, a term uſed in Scotland for a halfpenny. Johnſon.

BAUBIGNY, in *Geography*, a town of France, $1\frac{1}{2}$ league from Paris.

BAUBIS, in *Zoology*, a French name of a race of running dogs, called *chiens Normans*, or dogs of Normandy.

BAUBULA, in *Geography*, a river of Spain, in the province of Arragon, which runs into the Xalon, about a league below Calataiud.

BAUCIDIAS, in *Ancient Geography*, an iſland of Greece in the Saronic gulf. Pliny.

BAUCONICA, a town of the Vangiones, in Gallia Belgica, 9 miles from Mogontiacum, and 11 from Borbitomgum; ſuppoſed to be *Oppenheim*, which ſee.

BAUD, in *Geography*, a town of France, in the department of Morbihan, and chief place of a canton in the diſtrict of Pontivy, $3\frac{3}{4}$ leagues ſouth of Pontivy. The place contains 6115 and the canton 13,007 inhabitants; the territory includes $242\frac{1}{2}$ kiliometres and 4 communes.

BAUDANVILLER, a town of France, in the department of the Meurte, and chief place of a canton in the diſtrict of Blamont, $1\frac{3}{4}$ league ſouth of Blamont.

BAUDEKIN. See BALDACHIN.

BAUDELOT, CHARLES-CÆSAR, in *Biography*, was born at Paris in 1648, and ſtudied firſt at Beauvais, and then at Paris. He was, againſt his inclination, bred to the law, and pleaded as counſellor of the parliament of Paris for ſome time with ſucceſs. But he afterwards devoted himſelf to the ſtudy of antiquities. Having had an opportunity, in a journey to Dijon, to viſit the libraries and cabinets of the place, he began to make a collection of books and medals; and he was thus led to write a book "On the utility of Travelling," 2 vols. 12mo, 1686; the ſubject of which was inſcriptions, medals, ſtatues, bas reliefs, and other relics of antiquity. It paſſed through ſeveral editions in French, and was tranſlated into Engliſh. This work introduced him into an acquaintance with the moſt celebrated antiquaries of Europe, and was the means of his admiſſion into the academy of Ricoverati at Padua. In 1705, he was made a member of the academy of Belles Lettres; and he had the charge of the valuable cabinet of the ducheſs of Orleans. He was the author of ſeveral diſſertations on ſubjects of Medallic hiſtory and antiquities: and he is ſaid to have compoſed the firſt travels of Paul Lucas. He died in 1722, with the character of a mild, modeſt, and benevolent man. Nouv. Dict. Hiſt.

BAUDERON, BRICE, born at Charolles, about the middle of the ſixteenth century, diſtinguiſhed himſelf by his knowledge in pharmacy, to which he applied with ſuch ſucceſs, that a Pharmacopœia, publiſhed by him in 1588, became the ſtandard book for many years in France. It was founded on the Pharm. Lyonenſis, and of Du Boys, with the obſervations of Catalanus on diſtilled waters. Philemon Holland tranſlated it into Latin, and publiſhed it in London, in folio, 1639, and at the Hague in 1640. It has been ſince many times reprinted, both in French and Latin. He alſo publiſhed "Praxis de febribus, et de ſymptomatibus in morbis internis," 4to, 1620, Paris. In the preface to this book he ſays, he is now 80 years of age. He died three years after, 1623. His ſon, Gratian Bauderon, who was brought up to the ſame profeſſion as his father, died in 1615, aged 35 years. Haller Bib. Med. Pract. Eloy. Dict. Hiſt.

BAUDIER, MICHAEL, hiſtoriographer of France under Lewis XIII. was born of a noble family in Languedoc. He was the author of many works containing valuable information, collected with greater induſtry than taſte or genius. The principal are, "A general Hiſtory of the Seraglio and Court of the grand Signior," 8vo. Paris, 1633; "A general Hiſtory of the religion of the Turks, with the life of their prophet Mahomet, and the four firſt Caliphs," &c. 8vo. 1636; "A Hiſtory of the Adminiſtration of Card. d'Amboiſe, miniſter of ſtate under Louis XII.;" Paris, 1634, 4to; "Hiſtory of Marſhal de Thoiras," Paris, 1644, fol. and 1666, 2 vols. 12mo. He left in MS. a hiſtory of Margaret of Anjou, wife of Henry VI. of England, which is ſaid to have been tranſlated and publiſhed as an original work in England. Baudier was attached to the polite arts, and made a collection of medals and curioſities, ſuch as his fortune would allow. The time of his death is not known. Nouv. Dict. Hiſt.

BAUDIUS, DOMINIC, a learned philologiſt, was born in 1561, at Lille, in Flanders, and retired with his parents, who were of the reformed religion, from the perſecution of the duke of Alva, to Aix-la-Chapelle. After having ſtudied at Leyden, Geneva, Ghent, and other places, he ſettled at Leyden, where he applied with aſſiduity to the ſtudy of juriſprudence, and was made doctor of laws in 1585. He viſited England, and then travelled into France, where he obtained ſeveral diſtinguiſhed patrons, and reſided for 10 years. In 1602, he was nominated profeſſor of eloquence at Leyden, and he alſo delivered lectures in hiſtory and juriſprudence. In 1611, the States made him joint hiſtoriographer with Meurſius, and as ſuch he wrote in poliſhed

lished Latin, a "History of the Truce." He also acquired great reputation, both as a poet and prose-writer in that language. Towards the close of his life, he incurred the displeasure of prince Maurice, by his harangues in favour of peace; and he offended many persons by his political and religious sentiments, as well as by his moral conduct, which was not such as to secure respect. His poems indicate an irritable temper, and abound with classical abuse and defamation; and particularly against the enemies of Scaliger. Moreover, he was boastful, vain, importunate, and selfish: and his licentiousness, both with regard to wine and women, involved him in much disgrace. He died at Leyden in 1613. His poems, which manifest gravity and sonorousness of diction and elevation of sentiment, were first collected and printed in 1587; and a more complete collection was printed at Leyden in 1607, and reprinted at Amsterdam, and other places. The "Letters" of Baudius, published after his death, are more esteemed for their style, than his poems. He also published "Harangues," and some other pieces, all in Latin. Gen. Dict.

BAUDOBRICUM, or BAUDOBRICA, in *Ancient Geography*, a place of Gallia Belgica, upon the banks of the Rhine, south of Confluentes. The machines of war, called Balistæ, were under the conduct of a prefect residing in this place; and the head-quarters of the general were at Mogontiacum, or Mayence.--*Baudobrica* was also another place of Belgica Prima, north-east of Augusta Trevirorum, now *Beppart*.

BAUDOUIN, FRANCIS, in Latin *Baldwinus*, in *Biography*, an eminent civilian and man of letters, was born at Arras in 1520, studied at Louvain, and in his youth resided at the court of Charles V. At Geneva he became intimate with Calvin, and embraced the reformed religion. In France he conformed to the religion of the country, and taught the law at Bourges from 1538 to 1545. In Germany he delivered lectures at Strasburg, Heidelberg, and other places, avowing himself a protestant; but by joining Cassander in a project for bringing about a coalition of religions, he excited the lasting displeasure of Calvin and Beza, and others of the reformed party. He enjoyed the favour of cardinal Lorrain, the inveterate enemy of the Calvinists, and is supposed to have induced Antony, the weak king of Navarre, to abandon them. By that prince he was patronized, and appointed his delegate at the council of Trent. Upon the death of Antony in 1562, he was invited to Douay and Besançon, and finally settled at Paris, where his reputation, acquired by several learned works which he had published, rendered his lectures popular among persons of the first distinction. The duke of Anjou afterwards Henry III. wished to engage his pen in the justification of the massacre of St. Bartholomew's; but to this prince he delivered his sentiments like an honest man, and was so much esteemed by him that he appointed him one of his counsellors of state. Whilst he was preparing to follow Henry to Poland, he was seized with a fever, which terminated his life at the college of Arras in Paris in 1573. He was distinguished by his extensive knowledge, admirable memory, and persuasive eloquence. Notwithstanding the just reproach which he incurred by his versatility in religion, so that he was opprobriously denominated an "Hermaphrodite," he appears to have been a man of moderate and tolerating principles, and whilst he condemned the severities exercised against the protestants in the Low Countries, he also censured the unjustifiable zeal of Calvin in the persecution of Servetus. His Latin style was pure and elegant, and he left several works on the civil law, and also in ecclesiastical history and controversy, which have been much esteemed. Gen. Dict. Nouv. Dict. Hist.

BAUDRAND, MICHAEL ANTONY, a celebrated geographer, was born at Paris in 1633. When he had finished his studies, he accompanied cardinal Antonio Barberini as his secretary to Rome; and upon his return to France, he was employed in revising Ferrarius's Geographical Dictionary, which he enlarged by one half, and published at Paris in 1671, fol. By his travels in Germany, and his visit to England, he was furnished with a variety of observations that were useful to him in the compilation of his geography. Upon his return to France in 1677, he composed his Geographical Dictionary in Latin, intitled "Geographia ordine literarum disposita;" Paris 1682, 2 vols. fol. After a journey to Rome in 1691, he applied himself at Paris to the completion of his French Geographical Dictionary, which he was prevented from publishing by his death in the year 1700. This work was published at Paris in 1705, in folio, but it is said to be a corruption rather than a translation of the Latin Dictionary, printed in 1682. Gen. Dict.

BAUDROYE, in *Ichthyology*, the name of the *angler*, or *fishing-frog*, LOPHIUS PISCATORIUS) in *Camperact. Parif.* &c.

BAUERWITZ, or PAURWITZ, in *Geography*, a town of Silesia, in the province of Jagendorf, on the river Zinna, 10 miles N.W. from Ratibor. The neighbourhood is a rich corn country.

BAUGE, in *Commerce*, a drugget manufactured in Burgundy, with thread, spun thick, and coarse wool.

BAUGE', in *Geography*, a town of France, and principal place of a district in the department of the Mayne and Loire, seated on the river Coesnon, 6 leagues E.N.E. from Angers. The place contains 5003, and the canton 13,935 inhabitants; the territory includes 280 kiliometres and 17 communes. N. lat. 47° 31'. E. long. 0°. 10'.

BAUGY, a town of France in the department of the Cher, and chief place of a canton in the district of Bourges. The place contains 723, and the canton 7933 inhabitants: the territory includes 262½ kiliometres and 17 communes.

BAUHIN, JOHN, in *Biography*, born at Amiens in 1511, was early sent by his father to learn the practice of medicine and surgery, under an uncle of the same name at Paris. Here he had opportunity of hearing the lectures of Fernelius and Sylvius, and of seeing the practice of Tagault, then in high reputation. Under these celebrated masters he made such progress, that when only seventeen years of age, he was taken into the service of Catherine Queen of Navarre, and made her physician. Reading about this time the translation of the New Testament into Latin by Erasmus, and becoming thence a proselyte to the reformed religion, to avoid persecution he came to England, but at the end of twelve months, being assured of protection, he returned to Paris. Here however he was soon laid hold of, accused of heresy, and committed to prison, whence, at the end of eighteen months, he only escaped with his life, through the intercession of his patroness, queen Catherine. Removing from Paris he went to Antwerp, where for some time he taught and practised medicine and surgery: but the persecution against the favourers of the new doctrines commencing there, he fled with his family to Basle. Here he was at first employed by Frobenius, the famed printer, in correcting the press, until after giving the necessary proofs of his proficiency in medicine, he was admitted to practice, and soon acquired considerable celebrity, and in 1580, was made dean of the faculty. He died in 1582, aged 71 years. The only work left by him, is "Questiones tres medicæ, totidemque conclusiones;" printed at Basle, in 1558, fol.: probably an academical exercise. Athenæ Bauricæ.

BAUHIN, JOHN, son of the former, born at Lyons, in 1541, shewing early a disposition to the study of botany, after going through the preliminary exercises, was sent by his father, when only twenty years of age, to accompany the celebrated Gesner in his excursions over the greater part

of France, Germany, Italy and Swiſſerland. In this journey he collected a prodigious number of plants, which formed the baſis of his principal work, the "Hiſtoria Plantarum," which he even then had in contemplation, as appears by his correſpondence with Geſner, carried on long after his return, but which was not publiſhed until ſeveral years after his death. Having accompliſhed the principal object of his travels, he firſt ſettled at Baſle, where in 1566 he was elected profeſſor in rhetoric. Some time after he removed to Yverdun, and at length, on the invitation of the duke of Wirtemberg, to whom he was made principal phyſician, he went to Montbelliard, where he continued to reſide the remaining forty years of his life. Though botany engaged the greater part of his time and attention, yet he was not unmindful of other parts of natural hiſtory, as appears by his account of the medicinal properties of the principal mineral waters of Europe, particularly of the waters at Boll, in the principality of Wirtemberg, written at the command of the duke, to which he has added deſcriptions of thoſe complaints in which mineral waters are miſchievous; and his "Hiſtoria memorabilis luporum aliquot rabidorum, qui circa annum 1590, apud Monpelgartum, multorum damno, publicé graſſati ſunt," publiſhed at Montbelliard, 1591, 8vo. He died in 1613, aged 72 years. His correſpondence with Geſner, principally on botanical ſubjects, with his book "De plantis a divis ſanctiſve nomen habentibus," was publiſhed by his brother Gaſpard, at Baſle, 8vo, 1591, parvum libellum, Haller ſays, et quaſi ſpecimen ſecuturi operis. In 1593, he publiſhed at Montbelliard alſo, in 8vo. "De plantis abſinthii nomen habentibus." The prodromus of his great work was publiſhed at Yverdun, in one volume 4to. in 1619, under the names of J. Bauhin and Henry Cherler, his brother-in-law, who had contributed to its perfection. In this ſpecimen, Haller ſays, you ſee the rudiments of a natural claſſification of plants. The "Hiſtoria plantarum nova, et abſolutiſſima, cum auctorum conſenſu et diſſenſu, circa eas," upon which the author had beſtowed above forty years' labour, was at length publiſhed at Yverdun in 1650 and 1651, in three volumes in folio, under the care of Dr. Chabré. Notwithſtanding the numerous errors in this book, many of which Haller ſays ſhould be imputed to the editor, who was but indifferently qualified for the taſk he had undertaken, it is a noble and valuable work, and deſervedly places the author in the firſt rank among the improvers of botany. Haller's Bib. Botan. Gen. Biog.

Bauhin, Gaspard, born at Baſle in 1560, twenty years later than his brother John, having the advantage of his brother's experience to guide him in his inquiries, made proportionally early advances in knowledge. After paſſing through the neceſſary preliminary ſtudies, under Fabricius ab Aquapendente, Sev. Pinæus, and other celebrated anatomiſts at Padua, Montpellier, and Paris, and having collected in his travels a large number of plants, many of them unnoticed by his brother, he returned to Baſle in 1580, and was admitted doctor in medicine. In 1582, he was made Greek profeſſor, and in 1558, profeſſor of anatomy and botany, of which he is called in his epitaph the Phœnix. He was afterwards made profeſſor of the practice of medicine, archiater, or principal phyſician to the city of Baſle, dean of the faculty of medicine, and rector of the univerſity, which diſtinguiſhed honours he continued to hold to the time of his death, which happened in 1624.

Indefatigable in his attention to the duties of his ſeveral offices, he diſcharged them with ſuch regularity as to ſecure to him the affection of his pupils, who materially aſſiſted him in collecting plants, neceſſary in completing his botanical works, to which alſo his correſpondents in different parts of Europe largely contributed.

Notwithſtanding the number and variety of his offices, much of his time muſt have been employed in compoſing and preparing for the preſs his numerous publications on anatomy and botany; and though great additions and improvements have been made in our knowledge in thoſe ſciences ſince his time, many of our author's works are ſtill conſulted, and held in eſtimation. A few of the titles to his principal works follow: for the reſt, ſee the Bib. Anat. and Bot. of Haller. "Franc. Rouſſetti l. de partu cæſareo, e Gallico in Latinum tranſ." 4to. 1586, Baſle. Two years after he republiſhed this work with an appendix, containing additional caſes of women who are ſaid to have undergone the operation and recovered; to which is alſo added a deſcription of the valve of the colon, of which he claimed the diſcovery. "Theatrum Anatomicum, infinitis locis auctum, Francof." 1621, 4to. including ſeveral ſmaller works on anatomy, publiſhed by him before at various times. "Vivæ imagines partium corporis humani æneis formis expreſſæ, ex theatro anatomico Caſp. Bauhini deſumptæ;" Baſle 1620. The figures are principally from Veſalius and Euſtachius; ſome are proper to the author. In this work alſo are contained other diſcoveries in anatomy made by the author. "De hermaphroditorum monſtroſorumque partium naturâ," Oppenheim, 1618, 8vo. In 1598, he publiſhed "Matthioli opera, quæ extant omnia," fol. Franc. in which there are many plants Haller, ſays, not before deſcribed. "Pinax theatri botanici, ſeu Index in Theophraſti Dioſcoridis, Plinii, et botanicorum qui a ſeculo ſcripſerant opera," &c. Baſileæ 1623, 4to. a work extremely uſeful to perſons conſulting the older botanical writers. "Catalogus plantarum circa Baſileam naſcentium," Baſil 1622, 8vo; the largeſt catalogue extant, Haller ſays, of plants growing in a ſingle diſtrict.

Bauhin, John Gaspard, ſon of the former, born March 12th 1606, after being well inſtructed in the Latin and Greek languages, and initiated in the knowledge of botany, anatomy, and other branches of medicine under his father, went to Paris in 1624, where he continued two years, attending the ſchools of the moſt celebrated maſters there. He afterwards viſited England, Leyden, Padua, and various other places; the fame of his anceſtors procuring him an eaſy introduction, wherever he went, to the moſt diſtinguiſhed perſons. Returning to Baſle in 1628, he was made doctor in medicine, and two years after profeſſor in anatomy and botany, which offices he held for thirty years. In 1660, he was was made profeſſor in the practice of medicine, and was ſeveral times appointed dean of the faculty, and rector of the univerſity. He died July 14, 1685.

Notwithſtanding the numerous honours conferred upon him, he does not appear to have contributed much to the improvement of the ſcience he profeſſed, having only left three diſſertations of little note or value. "De peſte, de morborum differentiis et cauſis, et de Epilepſia."

BAUHINIA, ſo named by Plumier in honour of the two famous botaniſts, John and Caſpar Bauhin, in *Botany*. Lin. gen. 511. Reich. 554. Schreb, 697. Plum. 13. Juſſ. 351. Claſs and order, *decandria monogynia*. Nat. Ord. *lomentaceæ : leguminatæ* Juſſ. Gen. Char. *Cal.* perianth oblong, gaping longitudinally on the lower ſide, reclining on the other, gaping alſo five ways at the baſe, with five cohering leaflets above, deciduous. *Cor.* petals five, oblong, waved with attenuated reflected tops, expanding; the lower ones a little larger, the upper ones more diſtant, all with claws placed on the calyx. *Stam* filaments 10, declining, ſhorter than the corolla; the tenth much the longeſt; anthers ovate, always on the tenth, ſeldom on the reſt. *Piſt.* germ oblong, ſitting on a pedicel; ſtyle filiform, declining; ſtigma obtuſe, riſing. *Per.* legume long, ſubcolumnar, one-celled. *Seeds* many, roundiſh, compreſſed, placed according to the length of the legume.

legume. Eſſ. Char. *Cal.* five-cleft, deciduous. *Pet.* expanding, oblong, with claws, the upper one more diſtant, all inſerted into the calyx. Legume. Species, 1. B. *ſcandens*, climbing mountain ebony. Folium linguæ, Rumph. Amb. 5. t. 1. Clematitis Indica, Ray Suppl. 328. n. 13 & 14. Naga-mu-valli, Rheed. Mal. 8. 57. t. 30, 31. "Stem cirrhiferous." Riſing with many ſlender ſtalks, which put out tendrils and faſten themſelves to the neighbouring trees; leaves alternate, heart-ſhaped, on long foot ſtalks, ſix inches long, three and a half broad in the middle, deeply cut into two-pointed lobes, each having three prominent longitudinal ribs; flowers at firſt whitiſh, turning to a yellowiſh colour; fruit ſlender and flat, containing ſix or eight flat bony ſeeds, black with a ſilvery border. A native of both Indies, not producing flowers in England. The ſeeds were ſent to Mr. Miller from Campeachy, probably before the year 1752.—2. B. *aculeata*, prickly, ſtalked mountain E. "ſtem prickly." An erect inelegant ſhrub, about a man's height; trunk and branches prickly, leaves roundiſh, with two roundiſh blunt lobes; cloven to one-third of their depth, ſmooth with nine nerves; petiole thicker and callous at both ends, from the baſe of which proceeds on each ſide a ſharp ſhort prickle, diſtilling when young nectareous drops; flowers large, white, and having an unpleaſant ſcent; riſing, in Jamaica, to the height of ſixteen or eighteen feet, and plentiful there and in the other ſugar iſlands of America; the flowers are ſucceeded by pods, about three inches long, containing two or three ſwelling ſeeds; the pods are glutinous, and theſe, as well as the bruiſed leaves, have a ſtrong balſamic ſcent; called in America the Indian ſavin-tree, from its ſtrong odour, which ſomewhat reſembles the common ſavin. It is frequent about Carthagena in woods; cultivated by Mr. Miller in 1752.—3. B. *divaricata*, dwarf mountain E. "leaves ſmooth, lobes divaricated, acute, two-nerved; petals lanceolate." A low ſhrub, ſeldom riſing more than five or ſix feet high, dividing into ſeveral branches; corolla, white, and flowers in a ſimple upright raceme; having an agreeable ſcent, appearing during the [illegible] of the chief beauties of the hot-houſe: the pods are taper, about four inches long, and contain four or five dark-coloured ſeeds. A native of the north ſide of Jamaica, where it grows plentifully; cultivated by R. J. Lord Petre, before 1742; flowering from June to September.—4. B. *unguiata*, "leaves ovate, lobes parallel," differing from the others in its more oblong leaves, entire at the baſe, cloven to the middle into two ſtraight parallel lobes, and having nine nerves. The calyx is long, ſtreaked, and of a grey colour; the petals are ſubulate, ſtamens alternately ſhorter; legume very long, pendulous. It riſes to the height of twenty feet, with a ſmooth ſtem, dividing into many ſmall branches, terminated by looſe bunches of white flowers, which are ſucceeded by very long, narrow, compreſſed pods, each including eight or ten ſeeds. A native of America; the ſeeds were received by Mr. Miller from Campeachy.—5. B. *variegata*, variegated mountain E. Arbor S. Thomæ, Zanon. Hiſt. 26. t. 15. Chovanna-Mandaru; 1 Rheed. Mal. 1. 57. t. 32. "Calyxes one-leafed, bursting; petal ſeſſile, ovate; lobes of the leaves ovate-obtuſe." It riſes with a ſtrong ſtem, upwards of twenty feet high, dividing into many ſtrong branches; flowers large, in looſe panicles, at the extremity of the branches, of a purpliſh red colour, marked with white, and the bottom yellow; pods about ſix inches long, and ⅔ of an inch broad, each containing three or four compreſſed ſeeds. Growing naturally in both Indies, and introduced here by Mr. Bentick in 1690.—6. B. *purpurea*, purple mountain E. Chovanna-Mandaru; 2. Rheed Mal. 1. 59. t. 33. "Leaves ſubcordate, two-parted, rounded, tomentoſe underneath." A tall tree, differing from the foregoing in having larger leaves, more deeply cut, and more contracted on the ſides; the calyx is yellowiſh green, and red; the corolla of a very red purple, and one petal out of the five ſtreaked with white on the claw within and without; all lanceolate and diſtant; legumes larger than thoſe of any other ſort, being one and half or two ſpans long, and an inch broad. A native of the Eaſt Indies, where it flowers through the year. Introduced here in 1778.—7. B. *tomentoſa*, downy mountain E. Mandaru Maderaſpatenſe. Pluk. Alm. 240. t. 44. f. 6. Canſchena-pou, Rheed. Mal. 1. 63. t. 35. "Leaves cordate, lobes ſemi-orbiculate tomentoſe." This grows to the height of two fathoms, with a trunk nearly ſix inches in diameter, and divides into many branches; leaves ſmaller than thoſe of the foregoing, rounded, cloven half way, ſeven-nerved and blunt, with rounded lobes; having a ſtrong ſcent if rubbed during the night, when the lobes are clapped together; the calyx of the flowers green and bell-ſhaped, the corolla yellowiſh white; one of the petals having a duſky red purple ſpot at the claw; ſtamens yellowiſh white; flowers without ſmell. A native of the Eaſt Indies. Cultivated, ſays Ray, by Compton biſhop of London, in 1687.—8 B. *acuminata*, ſharp-leaved mountain E. Velutta-Mandaru, Rheed. Mal. 1. 61. t. 34. "Leaves ovate, lobes acuminate ſemi-ovate." This riſes to a man's height, with a trunk as thick as his arm; leaves more deeply cut, longer, contracted into a cuſp or point towards the end, nine-nerved, leſs divaricated; flowers bell-ſhaped, pure white, without ſcent; petals rounded and blunt; ſtamens white; legumes ſmaller than in the others, being four or five inches long, an inch broad, ſmooth, with a round broad back. A native of the Eaſt Indies.—9. B. *marginata*, "ſtem prickly, leaves cordate with round lobes, tomentoſe underneath;" ſeldom riſing more than ten feet high, dividing into many branches, armed with ſhort crooked ſpines; leaves alternate, heart-ſhaped, with two roundiſh lobes; flowers two or three together at the extremity of the branches, large, of a dirty white colour, and ſucceeded by flat pods, each containing two or three ſeeds —10. B. *rotundata*, "ſtem prickly, leaves ſubcordate, two-parted, rounded, flowers ſcattered;" riſing twenty feet high, with a ſtrong upright ſtem, ſending out branches towards the top, armed with ſpines in pairs, ſtrong and crooked; leaves like the former; flowers large and white, ſucceeded by long flat pods, narrow, and each including five or ſix ſeeds. This and the preceding are natives of Cathagena in New Spain.—11. B. *aurita*, long-eared mountain E. "Leaves ſubtranſverſe at the baſe, lobes lanceolate, porrected, three-nerved; petals lanceolate." Cultivated by Mr. Miller, in 1756, and flowering in September.—12. B. *porrecta*, ſmooth broad leaved mountain E. "Leaves cordate, lobes porrected, acute, three-nerved, petal lanceolate." A tree riſing about fifteen feet high, with ſeveral ſtraight trunks, thick as a man's leg, covered with a whitiſh bark, dividing into many branches and twigs; leaves three inches long and two broad, yellowiſh-green, ſmooth, with ſeven or more ribs, and ſome tranſverſe; the petioles an inch long; the flowers at the ends of the twigs, on pedicels half an inch long; petals long, red-white variegated or ſtriated; ſtamens long and white; legumes five or ſix inches long, brown. Growing on the hills in Jamaica. The wood very hard, and veined with black, whence the name of ebony. Cultivated by Mr. Miller, in 1739, and flowering in July.—13. B. *candida*, white-leaved mountain E. "Leaves cordate, pubeſcent underneath, lobes, ovate, obtuſe; calyxes attenuated upwards and elongated." A native of the Eaſt Indies, introduced by Dr. P. Ruſſel in 1777; flowering in May and June. There are many other ſpecies both from the Eaſt and Weſt Indies, not yet ſufficiently determined. The whole genus needs further inveſtigation.

Propagation.—All these plants, being natives of hot countries, will not thrive in England out of the bark-stove. They are propagated by seeds, procured from their native countries, which should be brought over in their pods. These must be sown in pots filled with light fresh earth, and plunged into a moderate hot bed of tanner's bark; and if the seeds be good, they will come up in six weeks, and in a month after they should be carefully shaken out of the seed pot, without injuring their roots, and each of them planted in a separate small pot filled with light loamy earth, and plunged again into the hot-bed, shading them till they have taken fresh root, and then admitting fresh air to them every day in warm weather. In autumn they must be placed in the bark-stove, and treated like other tender exotics, giving them but little water in winter. As these plants frequently flower in winter, they deserve a place in the stove. Martyn's Miller's Dict.

BAVINS, in *War*, faggots made of birch, heath, or other sort of brush-wood, that is both quickly fired and tough, 2½ or 3 feet long, with the brush-ends all laid one way, and the other ends tied with two bands. They are dipped and sprinkled with sulphur, like reeds, excepting only that the brush-ends only are dipped, and should be closed together before they are sprinkled, to keep them more close, in order to give a stronger fire, and to keep the branches from breaking off in shifting and handling them. See FASCINES.

BAULA, in *Ancient Geography*, a district of Italy in Campania, between Baiæ and the Lucrine lake, formed according to Tacitus, by the sea; and the seat of many country houses.

BAULAS, in *Geography*, a town of Syria, 50 miles east of Damascus.

BAULEM's *Kill*, a western water of Hudson's river, 8½ miles below Albany.

BAULOT, or BEAULIEU, JAMES, in *Biography*, of mean and obscure parentage, was born in the province of Burgundy, in 1651. Becoming acquainted with Pauloni, an Italian itinerant lithotomist, he travelled with him, as an assistant, for some years; but having at length, from observation, acquired the art of cutting for the stone and of curing ruptures, he separated from him, and soon became celebrated for his skill in both those arts. Though illiterate, and totally unacquainted with anatomy, yet he is said to have considerably improved on the method of operating used by his master; and even to have approached very near the mode now followed by the most celebrated surgeons. Following the steps of Pauloni, he visited in turn all the principal cities on the continent. In 1697, he went to Paris, where he at first operated with success, but failing in some cases, he went to Geneva, Aix-la Chapelle, and Amsterdam: in each of which places he was much resorted to; for having both improved his instruments, and his mode of using them, he was now generally successful. He next went to Strasburg, where he cut successfully a great number of patients, then to Venice, Padua and Rome, every where acquiring additional fame and reputation. He was of a singular disposition, and wore a sort of monkish habit, whence he became generally known by the title of Friar James. He at length settled in a village near Besançon, where he died, 1720, being sixty-nine years of age. In gratitude for the numerous cures he had performed at Amsterdam, the magistracy of that city caused his portrait to be engraved, and a medal to be struck, bearing for impress his bust Haller Bib. Chirurg. Gen. Biog. Dict.

BAULTE, in *Geography*, a river of Prussia, which runs into the Frisch Haff, a little below Frauenburg.

BAUM, in *Botany*. See MELISSA.

BAUM, *Bastard*. See MELITTIS.

BAUM, *Molucca*. See MOLUCCELLA.

BAUM, *Moldavian* and *Turkey*. See DRACOCEPHALUM.

BAUMA, in *Ancient Geography*, a town of Ethiopia near Egypt. Pliny.

BAUMÆ, an ancient town of Asia, in Mesopotamia, seated, according to Ptolemy, on the Euphrates.

BAUMAN, a remarkable cave in Lower Saxony, about 18 miles from Goslar; which has a narrow entrance, but within is spacious, and has many winding paths. The peasants traverse it in search of bones, which they sell for unicorn's horns. Some say that it extends as far as Goslar; and skeletons have been found in it, supposed to be those of men who have been lost in its devious windings.

BAUMANNIANA, in *Entomology*, a species of PHALÆNA (*Tortrix*) that inhabits Austria. The anterior wings are yellow, with two ferruginous anastomising bands bordered with silver: posterior one interrupted. *Fabricius*.

BAUME, ANTHONY, in *Biography*, chemist and apothecary, born at Senlis, February 26th, 1728. Applying early and diligently to the study of chemistry and pharmacy, he was soon distinguished for his superior attainments in those arts. In 1752 he was received into the company of apothecaries at Paris, and in 1773 made a member of the Royal Academy of Sciences. He was also several years lecturer in chemistry, an office he filled with distinguished credit to himself, and advantage to his pupils. In 1757 he published, in conjunction with doctor Macquer, "Plan d'un Cours de Chymie experimentale et raisoneé, avec un discours historique sur la Chymie;" 8vo. Paris. "Elemens de Pharmacie theorique et pratique;" Paris 1762, 8vo. "Manuel de Chymie, ou exposé des operations," &c. Paris, 1763, 8vo. These two works have passed through several editions. He also published "Memoires sur les Argilles, ou researches et experiences chymiques et physiques sur la nature des terres les plus propres à l'agriculture, et sur les moyens de fertiliser celles qui sont steriles," Paris, 8vo. 1770, which was well received. Eloy. Dict. Hist.

BAUME, *St.* in *Geography*, a mountain of France in the department of Var, between Aix, Marseilles, and Toulon. It is much frequented from a superstitious notion that Mary Magdalen died in this place.

BAUME *Bay*. See BALSAM *Bay*.

BAUMER, JOHN WILLIAM, in *Biography*, a German naturalist and physician, was born at Rheweiler in 1719, studied philosophy and medicine at Jena and Halle, and after having been settled as a clergyman, in 1742, at Krautheim, returned to Halle to study medicine, and in 1748, took the degree of doctor in that science. He afterwards became first professor of medicine at Erfurt, where he died August 4, 1788. His principal works are "Natural History of the Mineral Kingdom, particularly in regard to Thuringia." Gotha 1763, 1764, 2 vols. 8vo. "Historia Naturalis lapidum pretiosorum omnium," &c. Frankfort, 1771, 8vo. "Fundamenta politiæ medicæ," &c. "Frankfort and Lipf." 1777, 8vo. "Fundamenta Geographiæ et Hydrographiæ Subterraneæ." Gis. 1779, 8vo. and "Historia Naturalis Regni Mineralogici, and naturæ ductum tradita." 1780, 8vo. Gen. Biog.

BAUMES, LES DAMES, or BAUMES LES NONES, in *Geography*, a town of France and principal place of a district in the department of Doubs, on the river Doubs, 5 leagues N. E. of Besançon, and 8¾ N. of Pontarlier. The place contains 2300 and the canton 8927 inhabitants; the territory includes 205 kiliometres and 33 communes. It derives its origin from an abbey of cannonesses, which is said to have been founded in the 5th century, by St. Romain, abbot of Condat. Others assert that it was founded in the 7th century. About 5 miles from this town is shewn a remarkable cavern, in which, after descending 300 paces, is found the gate of a grotto, twice as large as that of a city. The grotto is

is 35 paces deep and 60 wide, and covered with a kind of vaulted roof, from which water continually drops. In this grotto is a ſmall brook, that is ſaid to be frozen in ſummer and not in winter. When the peaſants obſerve a miſt riſing from this cavern, they predict rain on the following day.

BAUMGANS, in *Ornithology*, the name of the bernacle goſe; Anas Bernicla, in *Friſch. Hiſt. Birds.*

BAUMGARTEN, Alexander Gottlieb, in *Biography*, an eminent philoſophical writer, was born at Berlin in 1714, and educated at Halle. Here he diſtinguiſhed himſelf by his private lectures in philoſophy; and after having officiated for ſome time as extraordinary profeſſor he was invited in 1740 to be profeſſor of philoſophy at Frankfort on the Oder. His conſtitution, being naturally feeble, was much impaired before the year 1751, by cloſe application to ſtudy, and his infirmities were aggravated by the loſs of a great part of his property, during the bombardment of the fortreſs of Caſtrin, whither he had fled for ſhelter. In 1760, his health being in ſome degree reſtored, he reſumed his labours with new ardour; but in 1762 he was carried off by a ſtroke of the apoplexy; having eſtabliſhed the character of an acute and ſound philoſopher, who united to an extenſive acquaintance with the ſciences, a diſtinguiſhed accuracy of judgment, and an agreeable cheerfulneſs of temper. His principal works are "Melophyſica;" Halle, 1739, 1743, 8vo, publiſhed in German by Meyer, with many alterations, and republiſhed by profeſſor Eberhard: "Ethica Philoſophica:" Halle, 1740, 1751, 8vo. "Æſthetica." Frankf. in Oder. 1750, 1758, 8vo. and "Initia Philoſophiæ Practicæ Primæ;" Frankf. 1760, 8vo. Gen. Biog.

Baumgarten, Siegmund Jacob, brother of the above, was born in 1706 at Wolmintſtadt on the Ohre, and having ſtudied at Halle became profeſſor of theology. He died in 1757, leaving numerous writings on theological ſubjects, and many tranſlations of French and Engliſh works into German. Gen. Biog.

Baumgarten, in *Geography*, a town of Germany, in the archduchy of Auſtria, 6 miles weſt of Feldſburg.

Baumgarten, a town of Bohemia, in the circle of Chrudim, 3 miles weſt of Politzka.

BAUMHOLDER, a town of Germany, in the circle of Upper Rhine, and Duchy of Deux Ponts, 10 miles weſt of Lautereck, and 25 north of Deux Ponts. Since the French revolution, it is the chief place of a canton in the department of Sarre, and diſtrict of Berkenfeld. The place contains 665 and the canton 6411 inhabitants: the territory comprehends 33 communes.

BAUMSWALDT, a foreſt of Pruſſia, on the borders of Lithuania, about 10 leagues long and 7 wide.

BAUNACH, a town of Germany, in the circle of Franconia, and biſhopric of Bamberg, near the river Mayne; 7 miles north of Bamberg. This is alſo the name of a canton of Swabia, ſo called from the river Baunach, which runs into the Mayne.

BAVOSA, in *Ichthyology*, a name given by the Italians to a ſpecies of Ray, called by modern naturaliſts *Raja Oxyrinchus*, which ſee.

BAVOTA, *Pacavita*, in ancient *Geography*, a town of Italy, in Japygia.

BAUR, BAWR, or BOUWER, John William, in *Biography*, an eminent painter of landſcapes and architecture, was born at Straſburg in 1610. After having been the diſciple of Frederick Brendel, he went to Rome for improvement; but though he poſſeſſed great genius and a fertile imagination, and reſided for a conſiderable time in and about Naples and Rome, where he devoted himſelf entirely to architecture and landſcapes, he retained the German taſte in all his figures, and neglected the ſtudy of nature or the antique; ſo that he never arrived at a grandeur of deſign. However his pencil was light, his compoſition good, and his general expreſſion beautiful, though his figures were ſomewhat heavy. His paintings in water-colours on vellum are held in the higheſt eſtimation. For the duke of Bracciano, at whoſe court he reſided for ſeveral years, he finiſhed ſome charming perſpective views of gardens, with ſtatues and fountains, and a number of elegant buildings, with many figures, coaches, cattle, and horſemen; and he generally diſtinguiſhed people of different nations by their appropriate dreſs. This artiſt alſo engraved a great number of plates from his own deſigns. His engravings from the Metamorphoſes of Ovid are generally preferred to the reſt. They are ſlightly etched, and retouched with the graver. The figures are ſmall, and incorrectly drawn. The back grounds are dark and heavy, and the trees are deſtitute of that lightneſs and freedom, which would render the effect agreeable. His pieces of architecture are well executed, and the perſpective finely preſerved. In his ſtyle of engraving he ſeems, in ſome degree, to have imitated Callot, and the nearer he approaches it, the better are his productions. The Metamorphoſes conſiſt of 150 middling-ſized plates. Baur died at Vienna in 1640. Pilkington and Strutt.

BAURAC, an ancient name for nitre, but in ſome places uſed in a reſtrained ſenſe, as not ſignifying every thing that was called by that name, but only one of two different ſalts that were confuſedly called nitre.

The Arabians give the name *baurach* to *tincar* or *tincal*, which when refined is called *borax*, but when it is rough, in little cryſtalline maſſes like the ſmall cryſtals of *ſal gem*, mixed with earth or other impurities, it is always diſtinguiſhed by the name of *tincal*. Neumann, p. 227. See Natron.

BAURINKEL, in *Geography*, a town of Germany, in the circle of Weſtphalia, and county of Lingen, 6 miles N. E. of Lingen.

BAUSCH, Leonard, in *Biography*, a phyſician of Schweinfurd, in Franconia, acquired conſiderable reputation by his commentaries on the works of Hippocrates, publiſhed 1594, folio, at Madrid. His ſon, John Laurence Bauſch, born at Schweinfurd, September 30th 1605, after the uſual ſchool education at home, viſited the principal ſeminaries in Germany, France, and Italy, and was made doctor in medicine at Altdorf in 1630. He had the merit of forming a ſociety of phyſicians, in 1652, who met at ſtated periods, and communicated ſuch obſervations in philoſophy and medicine as occurred in their practice, and ſeemed deſerving of being preſerved. This, in time, gave birth to the Academia Naturæ Curioſorum, of which he was the firſt preſident, and in 1671 they began to publiſh their memoirs, under the title of "Miſcellanea Curioſa Medico-Phyſica, Academiæ Naturæ Curioſorum," 4to. The ſociety ſtill continue their meetings, and have publiſhed near ſeventy volumes of the Miſcellany. Haller Bib. Med. Pract. Eloy. Dict. Hiſt.

BAUSCHWITZ, in *Geography*, a town of Sileſia, in the pricipality of Neyſze, 8 miles E. N. E. of Neyſze.

BAUSK, or Bautko, a town of Courland ſeated on the river Muſa, on the frontiers of Poland. It was taken by the Swedes, under Guſtavus Adolphus, in 1625, and by the Ruſſians under Czar Peter, in 1705, after a bloody battle between the Ruſſians and Swedes. N. lat. 56° 30'. E. long. 24° 44'.

BAUSSET, a town of France, and chief place of a canton in the department of the Var, and diſtrict of Toulon. The place contains 2980 and the canton 12,285 inhabitants, the territory includes 270 kiliometres, and 5 communes.

BAUTSCH, a town in Moravia, in the circle of Prerau, 18 miles N. of Prerau.

BAUTZEN, or Budiszin, the capital of Upper Luſatia.

ſatia, in Germany, ſituate in the circle of Budiſzin, on the river Spree, ſubject to the elector of Saxony, and fortified by a citadel, called the Caſtle of Ortenburg, ſtanding on a high rock, and ſeparated from the town by a ditch and ramparts. This citadel was founded before the town, which had its riſe in the 9th century. This town had formerly a conſiderable manufacture of linen, hats, ſtockings, and gloves, and alſo of glazed leather, cloth, fuſtian, &c. It has frequently ſuffered much from fire. It was taken by the Pruſſians in 1757; and after their retreat, taken poſſeſſion of by the citizens. The Lutherans and Catholics are allowed the free exerciſe of their religion. N. lat. 51° 10′. E. long. 14° 42′.

BAUX, Les, or Baulx, in Latin *Baltium*, a town of France, in the department of the mouths of the Rhone, and chief place of a canton in the diſtrict of Taraſcon, ſeated on a hill, having a ſtrong caſtle, formerly an independent barony, and afterwards a marquiſate. N. lat. 43° 42′. E. long. 5° 0′.

Baux *Iſland*, a name given by captain Marchand to a ſmall iſland of the Pacific ocean; being one of the group called Hergeſt's iſlands near the Marqueſas, and denominated by Hergeſt, *Sir Henry* Martin's *Iſland;* which ſee.

BAUZELY, *St.* a town of France, in the department of Aveyron and diſtrict of Milka. The place contains 823 and the canton 5850 inhabitants: the territory includes 242½ kiliometres and 12 communes.

BAWD, a perſon who keeps a place of proſtitution, or makes a trade of debauching women, and procuring or conducting criminal intrigues. Some think the word is derived from the old French *baude, bold* or *impudent;* though Verſtegan has a conjecture which would carry it higher, *viz.* from *bathe*, anciently written *bade*. In which ſenſe, bawd originally imported no more than bath-holder, as if bagnios had anciently been the chief ſcenes of ſuch proſtitution. The Romans had their male as well as female bawds; the former denominated *lenones* and *proagogi*, among us *panders;* the latter, *lenæ*.

By a law of Conſtantine, bawds were to be puniſhed by pouring melted lead down their throats.

BAWDER, in *Geography*, a river of England, which runs into the Tees, about 3 miles N. N. W. of Barnard-caſtle in the county of Durham.

BAWD-MONEY, in *Botany*. See Æthusa Meum.

BAWDSEY Haven, in *Geography*, a ſmall bay or anchoring place near the ſouth point of the coaſt of Suffolk, formed by the ocean, and the mouth of the ſmall river Deben, about a league to the eaſt of Languard fort.

BAWDY-House, a houſe of ill-fame, to which lewd perſons of both ſexes reſort for the purpoſe of licentious and criminal indulgence. Houſes of this kind, under the denomination of brothels and ſtews, are licenſed in ſome countries; and in England they were privileged by patent, regulated by ſtatute, and tolerated as a neceſſary drain for corruption, from the reign of Henry II. to the laſt year of Henry VIII. when they were ſuppreſſed by ſound of trumpet; and their ſuppreſſion was perhaps attended with greater ſolemnity than that of the convents. Their ſuppreſſion, however, failed to extirpate lewdneſs; and Latimer (Sermons, p. 43.), whoſe ſermons are replete with a barbarous eloquence, inveighs bitterly at its ſubſequent prevalence. In 1650, the repeated act of keeping a brothel, and alſo of committing fornication, was upon a ſecond conviction, made felony without benefit of clergy. But at the reſtoration, when hypocriſy deviated into the extreme of licentiouſneſs, it was not thought proper to renew a law of ſuch unfaſhionable rigour. The keeping of a bawdy-houſe is cognizable by the temporal law, as a common nuiſance, not only becauſe it endangers the public peace by drawing together diſſolute and debauched perſons, and promoting quarrels, but becauſe it tends to corrupt the manners of the people by an open profeſſion of lewdneſs. (3 Inſt. 205. 1 Hawk. P. C. c. 74.) Thoſe who keep bawdy-houſes are puniſhed with fine and impriſonment, and alſo ſuch infamous puniſhment, as pillory, &c. as the court ſhall think fit. A lodger, who keeps only a ſingle room for the uſe of bawdry, is indictable for keeping a bawdy-houſe. (1 Salk. 382.) Perſons reſorting to a bawdy-houſe are puniſhable; and they may be bound to their good behaviour. But if a perſon be indicted for keeping or frequenting a bawdy-houſe, it muſt be expreſsly alleged to be ſuch a houſe, and that the party knew it, and not by ſuſpicion only. (Poph. 208.) A man may be indicted for keeping bad women in his own houſe. (1 Hawk. P. C. c. 61. § 2.) A conſtable, upon information that a man and woman are gone to a lewd houſe, or about to commit fornication or adultery, may, if he finds them together, carry them before a juſtice of peace without any warrant, and the juſtice may bind them over to the ſeſſions. (Dalt. 214.) Conſtables may enter bawdy-houſes, call others to their aſſiſtance, and arreſt the offenders for a breach of the peace. In London, they may carry them to priſon; and by the cuſtom of the city, whores and bawds may be carted. (3 Inſt. 206.) By ſtat. 25 Geo. II. c. 36. made perpetual by ſtat. 28 Geo. II. c. 19. if two inhabitants, paying ſcot and lot, ſhall give notice to a conſtable of any perſon keeping a bawdy-houſe, the conſtable ſhall go with them before a juſtice of peace, and ſhall, upon the oath of ſuch inhabitants, that they believe the contents of ſuch notice to be true, and their entering into a recognizance of 20l. each, to give material evidence of the offence, enter into a recognizance of 30l. to proſecute with effect ſuch perſon for ſuch offence at the next ſeſſions. The conſtable ſhall be paid his reaſonable expences by the overſeers of the poor, aſcertainable by two juſtices; and upon conviction of the offender, the overſeers ſhall pay the two inhabitants 10l. each. A conſtable, neglecting his duty, forfeits 20l. Any perſon appearing as maſter or miſtreſs, or as having the care or management of any bawdy-houſe, ſhall be deemed the keeper of it, and liable to be puniſhed as ſuch. A wife may be indicted and ſet in the pillory *with* her huſband, for keeping a brothel; for this is an offence reſpecting the domeſtic œconomy and government of the houſe, in which the wife has a principal ſhare; and it is ſuch an offence as the law preſumes to be generally conducted by the intrigues of the female ſex. 1 Hawk. P. C. 2, 3.

BAWLING, among *Hunters*, is ſpoken of the dogs, when they are too buſy before they find the ſcent good.

BAWN, or Ban, derived from the Teutonick *bawen*, to conſtruct and ſecure with branches of trees, in *Antiquity*, an area incloſed with thick ditches of earth ſquare or circular, impaled with wooden ſtakes or the branches of trees, and ſurrounded with a deep trench. This was called in Iriſh *daingeau*, a word of Celtic origin. Numerous remains of ſuch fortreſſes are found not only in various parts of Ireland, but alſo in Britain, Germany, Sweden, and almoſt every country of Europe. The Iriſh gave great trouble to the Engliſh for many centuries by fortifying paſſes between the bogs and mountains in this manner, ſo that it was a tedious work to cut through them, and make the roads paſſable. This was called *plaſhing* a paſs, from the Franco-Gallic word *plaſſer*, which, like *bawen*, ſignifies to entwine; and it conſiſted in ſecuring the top of the vallum with ſticks interlaced with branches. Before the Engliſh invaſion, each family of the Iriſh is ſuppoſed by Mr. Ledwich, to have lived in a mud cabin ſurrounded by a *bawn*. The Engliſh introduced caſtles, in which they were imitated by the natives. In courſe of time, *bawn* came to ſignify an incloſure with a wall, inſtead of

of plashed stakes; and we find queen Elizabeth and James I. requiring those to whom grants were made, to construct castles with *bawns*, or courts round them, for the protection of their families and tenants. When the grant was not very considerable, a bawn with a house within it was sufficient. Of the latter kind was *Hamilton's bawn*, in the county of Armagh, which is mentioned in Dean Swift's works, and which now gives name to a village in that county. This was built of lime and stone, eighty feet square, with two round towers for flankers, and two stories high, vaulted, the wall itself being thirteen feet high. Within the bawn was a house of lime and stone, thirty-six feet long and twenty feet broad. Farther particulars may be found in Ledwich's Antiquities of Ireland, p. 188—196.

BAWOROW, in *Geography*, a town of Red Russia, in the palatinate of Lemberg, 64 miles east of Lemberg.

BAWT, a town of Persia, in the province of Irak-Agemi, 80 miles north of Ispahan.

BAWTRY, a market-town in the west riding of Yorkshire, and upon the confines of Nottinghamshire, in England, is seated on the high road to Scotland, and consists principally of one broad street, well furnished with inns. It is 9 miles from Doncaster, and 152 north from London. The river Idle induces a considerable trade from Derbyshire, of mill and grind-stones, as well as of lead and iron ware from Sheffield, which are conveyed hence to Hull and other parts of the country. The market is held on Wednesday and Saturday; and the town has also three annual fairs. Its houses are 174, inhabited by 798 persons. N. lat 53° 27'. W. long. 1°.

BAXA Terra, or *Barrer Bay*, lies on the west coast of Africa, 4 leagues south of the river Oro, which is in N. lat. 23° 30'. It is large, and has in several places good anchorage, especially on its northern side.

BAXAS Bahia, lies on the coast of Brasil, in South America, 30 leagues E. and E. by S. from the sand-bank of Tortugas, on Turtle harbour. It has good anchorage, hard ground, and deep water; and it is well sheltered by a sand-bank from the north wind, and by the land from all other winds.

Baxas, *Dar. Punta*, denoting a cape of shoals, is a low point, 12 leagues from the former, and 18 from Tortugas.

BAXEADORE, Cape, is situated in the island of Luconia or Manila, in N. lat. 18° 44'. E. long. 120° 35'.

BAXIOS, Abaxos, or *Abaxos*, are two clusters of rocks on the south-east side of the island of Ceylon, called the Great and the Little Basses. The former is in N. lat. 6° 10'. E. long. 81° 50'; and the latter in N. lat. 6° 25'. E. lon. 82° 10'.

BAXOS de Abrolhos. See Abrolhos.

Baxos *de Barbuna*. See Abrojos.

Baxos *de la Candelaria*, a shoal or reef of rocks, in the Pacific ocean, so called by Mendana in 1567, and lying, by M. Fleurieu's calculation, near S. lat. 64°. and E. long. from Paris 157½°.

Baxos, *Cape*, or *Low Cape*, is the east point of the entrance into the river Sestos, on the coast of Africa. It lies west of both cape Formosa and Palmas island, 2 leagues distant from the latter. On the east of this cape are several dangerous rocks, some of which are under water, and should therefore be carefully avoided by the trading ships that navigate in these parts.

Baxos *Cape*, lies also on the coast of Africa, eastward of the river Volta, 2 leagues from the Quatre Montes, or hills so called that are close together.

BAXTER, Richard, in *Biography*, an eminent divine among the non-conformists of England, was born at Rowton, a small village in the county of Salop, in 1615. His father was a small freeholder of exemplary character, who, though belonging to the established church, was charged with puritanism on account of his religious demeanour. Under his instruction and example, Baxter manifested early indications of that contemplative and pious disposition for which he was afterwards so distinguished. In his youth he enjoyed few advantages for education; the schoolmasters whom he attended being men of little learning and loose morals. But under the tuition of Mr. Wickstead, chaplain to the council at Ludlow, he had access to an excellent library, of which he availed himself about a year and a half very much to his improvement. At this time his views were directed to the profession of a minister. However, in 1633, Mr. Wickstead prevailed upon him to relinquish this object, and to seek his fortune at court. Accordingly he was recommended to sir Hen. Herbert, master of the revels; but disgusted with the mode of living which this situation presented to him, he soon retired into the country, and resumed his purpose of prosecuting his studies for the ministry. Being appointed master of the free school at Dudley, his health declined; and under the impression produced by the immediate prospect of dissolution, and by the perusal of several practical treatises, he acquired that deep and settled sense of religion which formed the ruling and permanent principle of his future life. Being more than ever determined to engage in the ministerial office and having at this time no scruples against conformity to the church of England, he was ordained in 1638; though he afterwards condemned his precipitance in complying with the laws of subscription without due examination; and he frequently preached at Dudley and in the neighbouring villages, much to the satisfaction of those who heard him. He objected, however, to some of the ceremonies of the church, and he soon began to entertain doubts concerning the lawfulness of conformity. What led him and several others to study the case of episcopacy, and to think unfavourably of the establishment, was the imposition of the "et cætera" oath, which expressed an universal approbation of the doctrine and discipline of the church of England, and a determination never to attempt any alteration in its government. Mr. Baxter demurred against taking this oath; and though he would have submitted to the ecclesiastical jurisdiction that was actually established, he could not conscientiously declare his approbation of it, and his determination to support it to the extent which this oath required. In 1640, he was invited by the principal inhabitants of Kidderminster to reside with them as a preacher; and this place became the scene of his ministerial services for about sixteen years. Such, indeed, was the success which attended them, that he was eminently useful in reforming the morals of the dissolute, and in promoting in the town and its neighbourhood a strict regard to religion. About two years after his settlement at Kidderminster, the civil war commenced; and on this occasion he took part with the parliament, and recommended the protestation prescribed by it, to the people. He was thus reduced to the necessity of leaving this town, and of repeatedly changing his residence, till at length he settled at Coventry, where he preached regularly once a week both to the soldiers of the garrison and to the people of the town. After the battle of Naseby, he became chaplain to the regiment of colonel Whalley, and attended it at several sieges, though he was never present in any engagement; so that the story of his having killed a man in cold blood, and robbed him of a medal, was an unfounded and scandalous fabrication. During these times of confusion, Mr. Baxter was a zealous friend to regular government both in church and state; and it is said that he

took

took great pains to repreſs the ſectaries. The accidental circumſtance of a profuſe bleeding at the noſe, which reduced him to a ſtate of great languor, was the occaſion of his being ſeparated from the army in 1647, and of preventing that ſervice to his country, which might have been expected from a perſon of his principles and moderation. However, he reſiſted to the utmoſt of his power, the meaſures of thoſe who afterwards uſurped the government of the kingdom; he oppoſed taking the covenant, preached againſt the engagement, and diſſuaded the ſoldiers from fighting againſt the Scots troops who came into the kingdom with Charles II.; and therefore the charge alleged againſt him, of his having been a trumpeter of rebellion, is altogether without foundation. When Cromwell aſſumed the ſupreme power, he boldly and openly declared, that he diſliked his uſurpation; and in a private conference expreſsly told him, that in his opinion the ancient monarchy was a bleſſing. To that form of government, Baxter always avowed his attachment; and in a ſermon preached before the parliament on the 30th of April 1660, the day preceding that on which they voted the king's return, he maintained, that loyalty to their prince was a thing eſſential to all true proteſtants of whatever perſuaſion. About the ſame time he preached a thankſgiving ſermon at St. Paul's, on occaſion of the ſuccess of general Monk; and this circumſtance refutes the charge of his having diſſuaded his excellency from concurring in, or bringing about that change.

After the reſtoration, Baxter was made one of the king's chaplains, and was always treated by him with peculiar reſpect. To his majeſty he ſpoke with the ſame freedom which he had uſed with the protector Cromwell. He ſtrongly repreſented the great importance of tolerating thoſe pious men who entertained doubts concerning the ceremonies and diſcipline of the church; and he obſerved, that the late uſurpers had ſo well underſtood their own intereſt, that they had found the way of doing good to be the moſt effectual means to promote it; and therefore he beſought the king that "he would never ſuffer himſelf to be tempted to undo the good which Cromwell or any other had done, becauſe they were uſurpers that did it;" and on the contrary, "that he would rather outgo them in doing good." At the Savoy conference he was one of the commiſſioners, and was employed in compiling the reformed liturgy. Having declined the preferment of the biſhopric of Hereford, which was offered him, he wiſhed to retire to his friends at Kidderminſter, and to officiate among them in the humble ſtation of a curate, but was not permitted. Diſappointed with regard to the object of his wiſhes, he preached for ſome time occaſionally in London; but the act againſt conventicles obliged him to retire firſt to Acton, and then to Totteridge. During the perſecution of the non-conformiſts, he preached, as opportunity offered, and the ſtate of the times allowed, either more openly or more privately; and he was ſometimes a ſufferer for his zeal, and ſometimes unmoleſted. After the indulgence of 1672, he chiefly reſided in London, and exerciſed his miniſtry, either occaſionally or ſtatedly, but not without interruption and moleſtation. To the ſufferings attendant on his profeſſion were added the infirmities of a feeble conſtitution, and frequent bodily diſorders, together with the loſs of the greateſt part of his fortune, in conſequence of the ſhutting up of the exchequer in 1671, and by the penalties inflicted upon him for the exerciſe of his miniſtry; but he bore all theſe evils with ſingular fortitude and patience. In 1684, he was treated with peculiar ſeverity. Although he was ſo ill as not to be able to ſtand, a warrant was granted againſt him, in order to his being bound to his good behaviour; and the conſtables who were entruſted with its execution, watched him ſo inceſſantly, that they prevented him paſſing from his ſtudy to his bedchamber; and by thus depriving him both of food and ſleep, at length effected their purpoſe, though they were not empowered to break open doors, and took him away to the Seſſion's-houſe, where he was bound in the penalty of 400l. to keep the peace; and he was brought up twice afterwards, though he kept his bed during the greateſt part of the time. In 1685, he was committed to priſon by a warrant from lord chief-juſtice Jeffries, for his paraphraſe on the New Teſtament, which was charged with being hoſtile to epiſcopacy, and brought to trial for ſedition. In the courſe of this trial, he was treated with all the brutal inſolence and tyranny, to the exerciſe of which that ruffian of the law, Jeffries, was accuſtomed; reviled by his judge in the groſſeſt terms, and prevented from obtaining the full defence of his counſel; and at laſt found guilty on the moſt frivolous grounds, and ſentenced to pay 500 marks, to lie in priſon till he paid it, and to be bound to his good behaviour for ſeven years. From this heavy penalty, however, after a confinement of ſeveral months, he was releaſed, in 1686, by king James, and allowed to remain in London, notwithſtanding the proviſions of the Oxford act. From this time he lived in a retired manner, neither interfering in the concerns of his party, nor taking any part in thoſe addreſſes which ſome of his brethren preſented to James II. on his indulgence. He perſiſted, however, in the performance of his miniſterial duties, till increaſing weakneſs confined him to his chamber. The cloſe of his life correſponded to the uniform tenor of it; the approaches of diſſolution were regarded by him with pious reſignation; and he died, with the tranquillity and hope appropriate to his exemplary character, on the 8th of December 1691. Urged by extreme pain to wiſh for a releaſe, he checked himſelf by ſaying, "It is not fit for me to preſcribe; where thou wilt, when thou wilt, and how thou wilt." To one who aſked him in his ſickneſs how he did, he replied, "Almoſt well." In 1662, Mr. Baxter married the daughter of Francis Charlton, Eſq. a diſtinguiſhed magiſtrate of the county of Salop; a woman of great piety, who entered thoroughly into his views concerning religion, and cordially approved all the ſacrifices which he made from a conſcientious regard to duty. She accompanied him in priſon, and ſubmitted, without repining, to all the hardſhips conſequent upon the perſecution which he ſuffered. She died 10 years before him.

"Richard Baxter was a man whoſe whole ſoul was engaged in his profeſſion. Ardent piety towards God, and zeal for the beſt intereſts of his fellow-creatures, were the active ſprings of his conduct; and few men have ever devoted more time and labour to thoſe objects. He paſſed a life of much contention and obloquy; but at this cool diſtance, no candid enquirer can miſtake his true character. His early ſtudies in divinity were not, perhaps, the beſt adapted to form a theologian. They conſiſted chiefly of the ſchoolmen and metaphyſicians of a dark age, and gave him a turn to ſubtleties of diſtinction, which made him ſtand apart in ſome theoretical points from all his contemporaries. Yet, in practical religion, the devotional warmth of his temper allied him to the pious of all denominations, and inſpired him with an enlargement of mind, which ſet him above the differences reſulting from petty controverſies. He was a moſt voluminous writer, and his works are ſufficient to make a library of themſelves. Above 145 diſtinct treatiſes of his compoſition have been reckoned up; of which 4 were folios, 73 quartos, and 49 octavos, beſides ſeveral others of a ſmaller ſize. They compriſe bodies of theology, practical and theoretical, beſides a vaſt number of tracts on particular topics." His practical works have been collected together in

in 4 vols. in folio. His income, it is said, which was not great, was increased by the profit which he made of his writings, for which he sometimes received 60 or 80 l. a year of the booksellers. But this money he seems to have employed for charitable purposes. Of his numerous works some of the principal were his "Methodus Theologiæ," printed in Latin in 1674, folio; his English body of practical divinity, published in 1673, folio, under the title of "The Christian Directory," &c.; "Gildas Salvianus, or the Reformed Pastor," 8vo. 1656, much esteemed by many divines; "Universal Concord," 12mo. 1658, giving an account of the terms upon which all Christian churches may hold communion; "Reasons for the Christian Religion," 1667; "Catholic Theology," fol. 1675, intended to reconcile the differences between the Arminians and the Calvinists; "A Treatise of Episcopacy," 4to. 1681; "A Treatise of Universal Redemption," 8vo. 1694. The most popular of his practical pieces were his "Saints' Everlasting Rest," and his "Call to the Unconverted," of which latter 20,000 were sold in one year, and it was translated into all the European languages, and into the Indian tongue. To those which we have enumerated, we may add his "Reformed Liturgy," his "Poor Man's Family Book," his "Dying Thoughts," and his "Paraphrase on the New Testament." The first book he published was his "Aphorisms of Justification" and the "Covenants," printed in 1649; and the last in his life-time, "The Certainty of the world of Spirits," printed in 1691; so that he was an author 42 years. One of his works is "A Narrative of his own Life and Times;" "which, though a rhapsody," says Mr. Granger, "composed in the manner of a diary, contains a great variety of memorable things, and is itself, as far as it goes, a history of non-conformity." Mr. Baxter was distinguished not only as a practical, but also as a controversial writer; and under this latter character, he particularly opposed the Antinomians. Few persons have suffered more rancorous abuse than Mr. Baxter; and few have been more highly respected both by his cotemporaries and posterity. Among his friends and admirers we may reckon some of the most distinguished characters of the age in which he lived, of whom many were members of the establishment, such as chief justice Hale, sir John Maynard, Dr. Barrow, bishop Wilkins, bishop Patrick, and bishop Burnet. The great chief justice Hale honoured him with an intimate friendship, gave a high encomium of his piety and learning to all the judges, and when he was in prison, on the Oxford act, left him a legacy in his will, and several large books, in his own hand-writing, on the matter of their conversations. Dr. Barrow has testified concerning his works, that "his practical writings were never mended, his controversial seldom confuted." Bishop Wilkins affirms, "that he has cultivated every subject which he has handled;" and he used to say of him, "that if he had lived in the primitive times, he had been one of the fathers of the church. Bishop Burnet's testimony is somewhat qualified. "Baxter," says he, "was a man of great piety, and, if he had not meddled in too many things, would have been esteemed one of the learned men of the age. He had a very moving and pathetical way of writing, and was his whole life long a man of great zeal and much simplicity; but was most unhappily subtle and metaphysical in every thing." Baxter was one of the last divines, whose name has distinguished a particular denomination or description of persons. See Baxterians. Calamy's Life of Baxter. Biog. Brit. Gen. Biog.

Baxter, William, an eminent philologist and antiquarian, was the nephew and heir of Richard Baxter, and born of parents in mean circumstances at Llanlugany, an obscure village of Shropshire, in 1650. He derived his pedigree, like a true Cambro-Briton, through a long series of ancestors from John Baxter, who, in the reign of Henry VI., settled at Shrewsbury; and he shews, that the name Baxter signifies originally a baker, in Saxon "Bæcester," and that it was given to that family, because they were bakers to the ancient princes of Wales, in which post, according to the custom of the ancient Celtes and Greeks, the noblest persons were employed.

In his infancy and youth, his education was so much neglected, that when he was sent to Harrow school in Middlesex at the age of 18, he knew not one letter, nor understood one word of any language but Welsh. But such were his talents and application, that he soon became distinguished by his extensive knowledge. In 1679 he published a Latin grammar, entitled "De Analogia, seu arte Latinæ linguæ commentariolus," &c. 12mo. Thus qualified for the profession of a schoolmaster, to which he devoted himself, he employed the greatest part of his life in this occupation. For some years he kept a boarding school at Tottenham High-cross in Middlesex; and he was afterwards elected master of the Mercers' school in London. Having acquired great celebrity as a scholar, and in the prosecution of antiquarian researches, and distinguished, perhaps, more by his learning than his judgment, he died in 1723. In 1695 he published a new and correct edition of "Anacreon," with notes, which was reprinted with considerable additions and improvements in 1710. His abuse of Tanaquil Faber, a former editor of Anacreon, was amply retorted upon himself by J. Cornelius de Pauw, in his 4to. edition of the same poet, published at Utrecht in 1732, who held his comments in great contempt. His edition of "Horace," printed in 1701, and reprinted with improvements in 1725, has obtained a more lasting reputation. Dr. Harwood pronounces this the best edition ever published, and the learned Gesner has testified his approbation of it, by making it the ground-work of his excellent edition. Bentley, famed for the severity of his criticisms, in speaking of it, calls Baxter "Vir reconditæ eruditionis." In 1719 Baxter published his dictionary of British antiquities, under the title of "Glossarium Antiquitatum Britannicarum sive syllabus etymologicus antiquitatum veteris Britanniæ atque Iberniæ, temporibus Romanorum," 8vo. By his skill in the British or Welsh tongue, and by means of etymology, he professes to correct Camden, and to add about 200 names of ancient places and rivers omitted in his Britannia; of this work, a second edition was published, after the author's decease, in 1733. His glossary of Roman antiquities, proceeding no farther than the letter A, was published in 1726 by Mr. Moses Williams, under the title of "Reliquiæ Baxterianæ," &c. and republished in 1731, with the title "Glossarium Antiquitatum Romanorum," &c. Lond. 8vo. Baxter also wrote four letters on subjects of antiquity, inserted in the first volume of the "Archæologia." He left behind him notes on Persius and Juvenal, and was the translator of some of Plutarch's lives "done into English" by several hands. Biog. Brit.

Baxter, Andrew, an ingenious metaphysician and philosopher, was the son of a merchant at Aberdeen, and born there in 1686 or 1687. He was educated in King's college in that city, and afterwards undertook the care of private pupils, some of whom were persons of rank and fortune. About the year 1730, he published in 4to. his celebrated work, entitled, "An Enquiry into the Nature of the Human Soul; wherein the Immateriality of the Soul

Soul is evinced, from the principles of Reason and Philosophy." This work, which was reprinted in 2 vols. 8vo. in 1737 and in 1745, was much applauded by several persons of eminence, and particularly by bishop Warburton, who, in his "Divine Lyegation," speaks of it as containing "the justest and precisest notions of God and the Soul," and "as one of the most finished of the kind, that the present times, greatly advanced in true philosophy, have produced." Of the author's sentiments, see some account under the articles DREAM, SOUL, and VIS *Inertiæ*. In 1741 Mr. Baxter went abroad with one of his pupils, and settled for some time at Utrecht, where he became acquainted with several literary persons, and whence he made several excursions into Flanders, France, and Germany. Upon his return to Scotland in 1747, he resided till his death at Whittingham, in the shire of East Lothian. His work entitled "Matho, sive Cosmotheoria Puerilis," was drawn up for the use of his pupils, and first printed in Latin, and afterwards greatly enlarged, and published in English, in 2 vols. 8vo. The second edition of this work was published in 1745, and the third in 2 vols. 12mo. in 1765. The design of this work was to deduce the principles of natural religion from the phenomena of the material world. A mistake in the astronomical theory, which the author did not live to rectify, as he had intended, had disgusted some readers; and therefore, in the third edition, the conference that was chiefly affected by that error, was suppressed, and the vacancy supplied by another. In 1750 the author published "an Appendix to the first part of his Enquiry into the Nature of the Soul," vindicating it from some objections, which was dedicated to Mr. Wilkes, with whom he formed an intimate acquaintance abroad. In this year Mr. Baxter, after having endured great sufferings from the gout, and a complication of disorders, with exemplary patience, closed his life about the sixty-third year of his age. He left behind him several unfinished MSS. on philosophical subjects, and one in a complete state, concerning the controversy between the English and foreign philosophers on the subject of the force of bodies moving in free spaces, which however was never published.

Mr. Baxter's learning and talents are sufficiently displayed in his writings. His application was such, that he sometimes sat up whole nights reading and writing: and yet his disposition was cheerful and sociable. In conversation he was modest and unassuming; and in the discharge of the social and relative duties of life, his conduct was exemplary. His mind was possessed with the most reverential sentiments of the Deity, and the general tenor of his life was conformable to the rules of virtue. He was economical without parsimony. Such was his disinterestedness, that he declined considerable offers of preferment, which he might have obtained if he had taken orders in the church of England. His knowledge of the modern languages was extensive; so that he could write and speak in French, German, Dutch, Italian, and Spanish. By his wife, whom he married in 1724, and who survived him ten years, he had one son and three daughters. Biog. Brit.

BAXTERIANS, in *Ecclesiastical History*, derive their appellation from Mr. Richard Baxter, a nonconformist minister; of whom we have already given an account. His theological system has been called Baxterianism; and those who embrace his sentiments in divinity, are called Baxterians. The Baxterians have endeavoured to strike into a middle path between Calvinism and Arminianism; and to unite both these schemes. They profess to believe in the doctrines of election, effectual calling, and other tenets of Calvinism; and consequently, suppose, that a certain number, determined upon in the divine counsels, will infallibly be saved. This they think necessary to secure the ends of Christ's interposition. But then, on the other hand, they reject the doctrine of reprobation, and admit that our blessed Lord, in a certain sense, died for all; and that such a portion of grace is allotted to every man, as renders it his own fault, if he doth not attain to eternal happiness. If he improves the common grace given to all mankind, this will be followed by that special grace which will terminate in his final acceptance and salvation. Whether the Baxterians are of opinion, that any besides the elect, will *actually* make such a right use of common grace as to obtain the other, and, at length, come to heaven, we cannot assuredly say, there may possibly be a difference of opinion upon the subject, as they approach nearer to Calvinism or Arminianism. Mr. Baxter appears, likewise, to have modelled the doctrines of justification, and the perseverance of the saints, in a manner which was not agreeable to the rigid Calvinists. Some foreign divines in the 17th century struck nearly into the same path; and, particularly, in France, M. le Blanc, Mr. Cameron, and the celebrated Mons. Amyrault. For a considerable time the non-conformist clergy in England were divided into scarcely any but two doctrinal parties, the Calvinists and the Baxterians. Of late the Baxterians have been less numerous. However, they are still a considerable body; and several persons are fond of the name as a creditable one, who probably go farther than Mr. Baxter did. The name, however, like other theological distinctions, will probably, in a course of time, sink into disuse, till it is either wholly forgotten, or preserved merely in the records of history. Biog. Brit. Art. BAXTER.

BAY, in *Botany*. See LAURUS.

BAY, *Loblolly*. See GORGONIA.

BAY, *Rose*. See NERIUM.

BAY, *Dwarf Rose*, and *Mountain Rose*. See RHODODENDRUM.

BAY, *Sweet Flowering*. See MAGNOLIA.

BAY *Plum*. See PSIDIUM.

BAY, in *Building*, denotes any kind of opening in walls; as a door, window, or even chimney.

BAY *windows* are the same with what we otherwise call *bow windows*.

BAY, in *Geography*, denotes a little gulf, or an arm of the sea, stretching up into the land; being larger in the middle within, than at its entrance, which is called the *mouth of the bay*. The largest and most remarkable bays are those of Biscay, Bengal, Hudson's, Panama, &c.

BAY of *All Saints*. See ALL SAINTS.

BAY of *Antongil*. See ANTONGIL.

BAY, *Baffin's*. See BAFFIN.

BAY of *Cancale*. See CANCALE.

BAY, *Chequitan*. See CHEQUITAN.

BAY of *Chesapeak*. See CHESAPEAK.

BAY of *Fires* lies on the east coast of New South Wales or New Holland, in the Pacific ocean, to the north of St. Patrick's Head. The north point of the bay is called Edystone, and the south point St. Helen's. A small rocky island is near the middle of its entrance, on each side of which is an open passage.

BAY of *Fresh Water*, lies south of Ascension bay in the north part of the gulf of Mexico. N. lat. 30°. W. long. 93°.

BAY of *Fundy*. See FUNDY.

BAY of *Good Fortune*, lies on the north coast of Chaleur bay, which is a large bay of the gulf of St. Lawrence, and on the north east coast of Nova Scotia in North America.

BAY, *Hudson's*. See HUDSON'S.

BAY of *Inlets*, a bay on the south east coast of New Holland,

land, between cape Palmerston and cape Townshend. S. lat. 21° 30′. to 22° 30′. W. long. 209° 36′. to 210° 40′.

Bay of *Islands* lies on the coast of Nova Scotia, on the continent of North America, about 6 leagues south-west from cape St. Mary.

Bay of *Islands* is also a bay on the northern island of New Zealand in the south Pacific ocean, lying on the north-east coast between cape Brett and cape Pococke. This bay is large and deep, and has many small islands in it. The best entrance into the bay is on the west side; within it are several lesser bays. S. Lat. 35° 12′. E. long. 174° 57′.

Bay of *Islands* is also a bay on the south coast of the straits of Magellan, towards the western entrance, W. by N. from Upright bay, and E. by S. from the bay of Disappointment. A cluster of small islands lies in the entrance, and in the east part of the bay: but the best entrance is between the westernmost of the two islands off the point of Cape Upright, and a small island farther west, where a ship may have safe passage, and anchor in 20 fathoms in soft mud, near the west coast of the cape, in S. lat. 53° 9′. W. long. 75° 32′.

Bay of *Isles* is an extensive bay of the gulf of St. Lawrence, on the west coast of Newfoundland, about 8 or 9 leagues to the S. W. from la Belle bay, and 14 or 15 leagues to N. N. E. from Porta port. The centre of the bay lies in about N. lat. 49° 5′. W. long. 58° 15′.

Bay of *Isles* is also a bay situate towards the west end of the north coast of South Georgia island, in the south Atlantic ocean.

Bay of *St. Louis*, lies on the Labrador coast, and has cape St. Louis on the north, and cape Charles on the south. It has many small islands; the largest of which is Battle island, in the mouth of the bay. The middle of the bay is in N. lat. 52° 23′. W. long. 55° 23′.

Bay *de Roche Fende*, lies on the west side of Lake Champlain, and the state of New York, 17 miles above Crown-point.

Bay of *Rocks* is a spacious bay of the Arabian sea, which forms a part of the Indian ocean, and lies on the south-east coast of Arabia, with good anchorage for ships.

Bay of *Seven Islands* lies W. N. W. from Moisie river, and about 18 leagues to N. N. E. from Trinity point, on the north shore of the gulf of St. Lawrence.

Bay of *Shoals*. See Baxas *Bahia*.

Bay of *St. Spirit*, is a large bay of the Indian ocean, on the south-east coast of Africa, on the north of the island and cape of Unhafa. It is sufficiently spacious to receive a fleet of ships, and is so called from the river St. Spirit, or Manica, which falls into this bay.

Bay, among *Farmers*, is that part of the barn where the mow is placed.

Bay, in *Hydraulics*, signifies a pen, or pond-head, made up a great height, to keep in a store of water for driving the wheels of a forge or furnace of an iron-mill, by the stream that comes thence through a passage, or flood-gate, called the *pen-stock*.

Bay *colour*, in *Manege*. The word *bay* is formed from the Latin *baius*, or *badius*, and that from the Greek βαϊς, *a palm-branch*, so that *badius* or *bay* properly denotes *color phœniceus*. Hence also, among the ancients, those now called *bay* horses, were denominated *equi palmati*.

The bay is the most usual colour among horses. It is a strong and perhaps invariable character in this colour to be attended with a black mane and tail, which the chestnut or any other colour that approaches it never is. The bay is also most frequently attended with black legs and feet up to the knees and hocks: the feet, however, are often varying to the white in horses of this colour, which is not with us esteemed so handsome as when entirely black. There are several kinds of bays, as light bay, dark bay, brown bay, golden bay, dappled bay, &c.

Bay *à mirroir*, the same as dapple *bay*.

Bay, among *Sportsmen*, is applied to stags, boars, foxes, &c. and also to dogs when they turn head against one another. Thus when a stag has been so long pursued, that he is almost exhausted, he turns round, and facing the hounds, defends himself with his antlers, and keeps the hounds at *bay*, till the sportsmen come up, draw off the dogs, and save his life. When a stag takes *soil*, that is, takes to the water, he will defend himself, and keep the hounds for a long time at *bay*, provided that he fathoms the lake or river so well as to keep the hounds swimming, without going out of his own depth, but if he is obliged to swim at the time, he *is up* or quite tired, and being surrounded by the dogs, he is inevitably drowned. In fox hunting, when the fox is supposed to have entered the earth, the place of his retreat is soon discovered by the terriers, "laying well at him," provided he has not *turned* in the earth; but if he has, the terrier and the fox are face to face, and are both baying, or keeping each other at *bay*; and the contest terminates with *digging out* the fox.

Bay *salt*. See Salt.

Bay *yard*, is a denomination sometimes used promiscuously with *woollen yarn*. 10 and 11 W. III. c. 10. 5 G. II. c. 21. See Yarn, &c.

BAYA, in *Geography*. See Baia, and Bayja.

Baya, low, marshy land on the Gold coast of Africa, without any towns or people near the shore; 4 leagues W. S. W. from the river Volta, and 8 leagues E. and E. N. E. from Ningo ground.

Baya, in *Ornithology*, Indian grosbeak, or *Loxia Indica*, is rather larger than a sparrow, with yellow brown plumage, a yellowish head and feet, a light-coloured breast, and a conic beak, very thick in proportion to his body. This bird is very common in Hindoostan; and is described as surprisingly sensible, faithful, and docile; never voluntarily deserting the place where its young are hatched, not averse from the society of mankind, and easily taught to perch on the hand of his master. In a state of nature the baya builds his nest on the highest tree which he can find; generally on the palmyra or Indian fig-tree, preferring that which overhangs a well or rivulet, forming it of grass in the shape of a large bottle, suspending it on the branches so as to be firm and yet to rock with the wind, and placing it with its entrance downwards, to secure it from birds of prey. This bird is taught with ease to fetch a piece of paper, or any small thing which his master wants. If a ring be dropped into a deep well, and a signal given to the bird, he will fly down with astonishing celerity, and bring it up to his master with apparent exultation; and it is confidently asserted, that if a house or any other place be shewn to him once or twice, he will carry a note thither immediately, on observing a proper signal. They are also trained by the youthful libertines of Benares to pluck off the pieces of gold called ticas, placed by way of ornament between the eye-brows of their mistresses, which they bring in triumph to their lovers. The baya's natural food is grasshoppers and other insects; but it subsists, when tame, on pulse macerated in water. The female lays many beautiful eggs, resembling large pearls: their white, when boiled, is transparent, and the flavour of them is exquisitely delicate. Asiatic Researches, vol. ii. p. 109.

BAYAGARES, in *Geography*, a town on the island of St. Domingo.

BAYAMO, called also *St. Salvador*, a town in the eastern part of the island of Cuba, having the town of Almo to the west, and St. Barbara to the south. It lies on the east side

of Estero river, about 20 miles from the sea; and it gives name to a channel, that runs between the numerous small islands and rocks, called "Jardin de la Reyna, or Queen's gardens," on the north-west, and the shoals and rocks that line the coast on the south-east side of it, from the bold point called Cabo de Cruz.

BAYARD, or Bajard, in some *Old Writers*, is an appellative for a horse. Hence the phrases, blind bayard, bayard's watering, bayard's green, &c.

BAYDER, in *Geography*, a small town of the Crimea or Taurida, which gives name to the delightful valley, called by the natives the "Tauric Arcadia," the "Crimean Tempe," &c. which is watered by two gentle murmuring streams. It is of an oval form, about 20 miles long, and surrounded by high mountains, covered with beautiful woods, intermixed with odoriferous flowering shrubs. It contains a number of Tartar villages, romantically situated and inhabited by the families of shepherds and husbandmen.

Bayder, *Cape*. See Bajador.

BAYEN, Peter, in *Biography*, a French chemist, was born at Chalons in 1725. In 1749, he served under Charas in pharmacy. He gave analyses of the mineral waters of France; and he wrote memoirs on marbles, serpentine stones, porphyries, granites, jaspers, schists, and iron spar. He doubted the existence of the phlogiston of Stahl; and by operating on mercurial precipitates, he found that what are called metallic oxides owe their state, when obtained by calcining metals, to the absorption of one of the constituent ingredients of atmospheric air. This chemist also discovered the fulminating property of metals, when mixed with a very little sulphur; and he shewed that tin was not necessarily contaminated by arsenic; that what is used by potters contains copper and antimony, by which it is rendered hard; zinc, by which it is whitened; bismuth, by which it is rendered sonorous; and lead, in order to diminish the price. Bayen died at the age of 72 years. Mem. de l'Institut. National, &c. vol. ii.

BAYER, Gottlieb Siegfried, a celebrated philologist, was born at Konigsberg, in Prussia, in 1694, and studied, chiefly, the languages, first in his native city, and afterwards at Dantzig, Berlin, and Leipsic; at which latter place he took the degree of master of arts in 1717. On his return to Konigsberg in the following year, he was appointed librarian of the public library. In 1726 he removed to Petersburg, became professor of the Greek and Roman antiquities in the Academy of Sciences, and acquired an extensive knowledge of the Chinese and other Asiatic languages. In 1730 he was chosen member of the Academy of Sciences at Berlin; and in 1731 invited to be professor of eloquence at Halle; which he was not allowed to accept, but continued in Russia with a considerable increase of salary. He died at Petersburg in 1738. His numerous dissertations on different subjects are inserted in Lilienthal's "Select. Histor. & Liter." the "Acta Eruditorum," and the "Comment. Acad. Petropol." &c. His "Museum Sinicum," published in 1732, in 2 vols. 8vo. is a work of great learning and ingenuity. Gen. Biog.

BAYER, John, a German astronomer, flourished at the close of the 16th and commencement of the 17th centuries; but the time and place of his birth are not ascertained. Some have supposed that he was the grandfather of the subject of the preceding article, and that he was born at Augsburg. It was at Augsburg, however, that he published, in 1603, his excellent and useful work, entitled "Uranometria." This is a large celestial atlas, consisting of folio charts of all the constellations, with a nomenclature, collected from all the tables of astronomy, ancient and modern, improved by his own useful invention of denoting the stars in each constellation by Greek letters, in alphabetical order according to the magnitude of each. The stars are thus as easily distinguished as if each of them had an appropriate name; and the utility of this mode of classification has been so much approved, that it has been retained, since Bayer's time, in all the atlasses, catalogues, and celestial globes through the scientific world. This valuable work was gradually improved and augmented by the author himself. In the year 1627 Julius Schiller, a civilian, projected by the suggestion of Bayer, and published his Uranographia, under the title of "Cœlum Stellatum Christianum;" in which he rejected the heathen names, characters, and figures of the constellations, and inserted in their stead others taken from the scriptures. Accordingly he placed the twelve apostles in the zodiac; and he deduced the southern constellations from the Old Testament, and the northern ones from the New Testament. This innovation, however, tended to embarrass astronomers, and was never adopted. The ancient names were therefore restored in the later editions of the Uranometria of 1654 and 1661. Montucla, Hist. des Math. tom. ii. p. 333. See Catalogue.

BAYERSDORF, in *Geography*, a town of Germany, in the circle of Franconia, and principality of Bayreuth, seated on the Rednitz, with a tribunal of justice and a large synagogue; 4 miles north of Erlang.

BAYETTE, in *Ichthyology*, a French name of the species of *Silurus* observed by Sonnini in the Nile, and figured pl. 27 of his "Voyage en Egypte." It is the same kind which Forskall calls Silurus bajad. It grows to a large size, but its flesh is not much esteemed.

BAYEUX, in *Geography*, a town of France, and principal place of a district, in the department of Calvados. Before the revolution it was the capital of Bessin, in the province of Normandy, the seat of a governor and the see of a bishop, whose diocese included 611 parishes. The cathedral is much admired. The principal commerce is leather. It is seated on the river Aure, about 4 miles from the sea. The place contains 9970 and the canton 15,261 inhabitants, in a territory of 80 kiliometres, including 19 communes. N. lat. 49° 16′ 30″. W. long. 0° 42′ 51″.

The celebrated tapestry of Bayeux, which still exists, and is publicly exhibited at stated periods in the cathedral of the city, is a very curious monument of the state of the art of embroidering at the time of the Norman conquest. It is a web of linen, nearly two feet in breadth, and 442 in length, embroidered with the history of that memorable expedition, from the embassy of Harold to the Norman court in 1065, till his death in the following year. The scenes of this busy period are successively exhibited, and consist of many hundred figures of men, horses, beasts, birds, trees, houses, castles, and churches, with inscriptions over them explanatory of their meaning and history. This work is understood to have been performed under the direction of Matilda, consort to William I. and was not improbably executed by the hands of English women, whose superiority in performances of this kind was then universally acknowledged. The entire contents of this tapestry are represented in a series of engravings, which may be seen in Montfaucon, tom. 1 & 2; and Ducarel, Anglo-Norman Antiquities, App. No. 1.

BAYF, or Baif, Lazare De, in *Biography*, was the son of a gentleman of Anjou, and having studied under Budæus and others, he pursued the profession of the law at Paris; and afterwards travelled into Italy, and learned Greek under Musurus, a Candiot, at Rome. Upon his return he devoted himself to literature, and retired to his own estate at Anjou. In 1531 he was sent by Francis I. as ambassador to Venice; in

in 1539 he was deputed on public business to Germany; and after his return was made master of requests, and had also the abbacies of Grenetiere and Charroux. The precise time of his birth and death is unknown. As a writer he seems to have been the first who introduced the Greek tragedy among his countrymen, by his translations of the "Electra," of Sophocles, and the "Hecuba," of Euripides, into French verse. He was also the author of two learned treatises, "De re vestiaria, et de vasculis," Basil, 1526, 4to. and "De re Navali," Par. 1536, 4to.; and he translated some Lives of Plutarch. Moreri.

Bayf, John Anthony. See Baif.

BAYJA, Baja or Baia, in *Geography*, a town of Africa, in the kingdom of Tunis, not far from the frontiers of the Algerines, is supposed to be the ancient "Vacca" of Sallust, the "Oppidum Vagense" of Pliny, and the "BAIA" of Plutarch; and it is at this day, as it was formerly, a place of great trade, being the chief mart of the whole kingdom, particularly for corn, which is supplied in such abundance by the plains of Busdera, along the banks of the Mejerda, that the Tunisians say proverbially concerning it, that if there was another such town for plenty of corn, it would become as common and cheap as sand. It has also every summer a public fair, to which the most distant Arabian tribes resort with their flocks, their manufactures, and their families. However, the inhabitants, subject to the oppressive exactions of government, and the frequent incursions of the Arabs, who are numerous and powerful in its vicinity, are extremely poor, and a great part of their ground remains uncultivated. It is seated on the declivity of a hill in the road to Constantina, about 10 leagues from the northern [illegible], and 36 W.S.W. from Tunis; and has the convenience of being well watered. On the summit of the hill is a citadel of no great strength. The walls, which are raised out of the materials of the old Roman Vacca, are still entire, and have some ancient inscriptions. N. lat. 36° 42′. E. long. 9° 25′. Shaw's Travels, p. 92.

BAYLE, Peter, in *Biography*, an eminent critic and philosopher, was the son of a protestant minister at Carla, in the county of Foix in France, where he was born in 1647. Whilst he pursued his studies, first under his father, and afterwards in the protestant academy at Puylaurens, whither he was sent in 1666, his application was so intense and unintermitting as to injure his health. His reading was very extensive; but his favourite authors were Plutarch and Montagne. From Puylaurens he removed in 1669 to the university of Toulouse, with the hope of enjoying superior advantages for improvement, and of making more rapid progress. Here he attended the philosophical lectures that were read in the college of the Jesuits; and his disputes with a popish priest, who lodged in the same house with him, served to increase the scruples which he had already begun to entertain against the protestant religion, and at length to induce him to avow himself a Roman Catholic. This change of opinion, which seemed to be on his part the result of inquiry and of conviction, although produced by arguments which maturer examination would discover to be inadequate, manifested an ingenuity of mind. However it so grieved and offended his father, that he withdrew from him the necessary means of subsistence. In these destitute circumstances, he was generously relieved by the bishop of Rieux, who must unquestionably have been gratified by the accession of such a convert. Upon further inquiry Bayle found, that he had been too precipitate in abandoning his religion; and he therefore determined to leave Toulouse after having continued there about eighteen months, and to renounce the errors into which he had been betrayed. Having made his abjuration in the presence of his eldest brother and some other ministers, he immediately set out for Geneva, in order to prosecute his studies. Here he soon found reason for relinquishing the philosophy of Aristotle, to which he had been zealously attached, and to adopt that of Descartes. His reputation introduced him to an acquaintance with several persons of eminence at Geneva, and particularly with Mr. James Basnage; between whom and Bayle an intimate friendship subsisted as long as they both lived. At this time Bayle acquired the means of support by private tuition; but dissatisfied with this mode of life, which did not suit the independence of his spirit, nor correspond to his desire of further improvement, he wished to exchange it for some situation better adapted to his genius and views. After a few years employed in this way an opportunity offered for gratifying his wishes. In the spring of 1675 he removed to Paris, and undertook the tuition of Messrs. de Beringhen, brothers to a counsellor in the parliament of Paris. From this city, however, to which his wishes had been directed, he soon removed, at the desire of his friend Mr. Basnage, in order to offer himself as a candidate for the vacant professorship of philosophy in the protestant university of Sedan. His views were favoured by Mr. Jurieu, the professor of divinity, who favoured Bayle, partly because he was anxious to exclude another candidate. Bayle evinced a decided superiority to the other competitors in a public disputation, and having secured his election, began his lectures, Nov. 11, 1675. By the assiduity with which he discharged the duties of his public office, and by the amiable temper which he manifested in private life, he gained great reputation, and many friends at Sedan; and he devoted his hours of leisure to compositions of the critical kind, which habituated him to that accuracy and depth of reasoning, that afterwards constituted his distinguishing excellence. The first work, which he committed to the press, was his Observations on the comet that made its appearance in December 1680; the first edition of which was printed at Rotterdam in 1682, without a name, and under the assumed character of a Roman catholic, under the title of "Lettre a M. L. A. D. C. docteur de Sorbonne," &c. and Cologne was the pretended place of publication. In this treatise, afterwards called "Pensées sur la Comete," &c. many delicate questions are discussed, relative to supposed miracles wrought, and presages given among the heathens, to the comparison of the mischiefs of atheism with those of idolatry, and to other points which afforded a range to the author's spirit of free inquiry. In 1681 the university of Sedan was suppressed by an arbitrary edict of Lewis XIV.; and Mr. Bayle, deprived of his professorship, was reduced to the necessity of seeking some new employment. At this time, the magistrates of Rotterdam established a "Schola Illustris;" and Bayle was appointed professor of philosophy and history; and at his recommendation Jurieu was engaged as professor of divinity. In December 1681, Bayle entered on his new office. In the next year he published a criticism on Maimbourg's "History of Calvinism," in the form of letters, under the title of "Critique Generale de l'Histoire du Calvinisme de M. Maimbourg." This work written in a lively manner, and with a vein of raillery, was read with pleasure by persons of the reformed religion, and it was particularly agreeable to the prince of Condé, who was no friend to Maimbourg. Although it was publicly condemned at Paris, it became popular in Holland, and a new edition of it, with enlargements, was speedily published. Jurieu had also published a refutation of Maimbourg; but being much less popular than Bayle's, the author began to regard his brother professor with a considerable degree of jealousy.

jealouſy. In 1684 Mr. Bayle was induced, by the freedom of the preſs in Holland, to print ſeveral controverſial works, that were ſent him from France; and particularly "A collection of ſome curious pieces relative to the philoſophy of Deſcartes," with a preface, giving an account of theſe pieces, and containing ſome reflections on the inquiſitorial power exerciſed in France over books on ſcientific topics. In this year he began his monthly literary journal, entitled "Nouvelles de la Republique des Lettres," which was written in a manner that ſerved not only to ſupport, but to increaſe the reputation which he had already gained. About this time he declined an offer of the profeſſorſhip of philoſophy at Franeker, though it was propoſed very much to augment the ſalary which he received at Rotterdam. His "Nouvelles Lettres de l'Auteur de la Critique generale de l'Hiſtoire du Calviniſme de M. Maimbourg," which was a continuation or ſecond part of his former work, and printed in 1685, excited much leſs attention than the firſt. Having given an opinion in favour of M. Malebranche in his account of Arnauld's book written againſt him, he was engaged in a diſpute with the latter; and in 1686 he had a correſpondence with Chriſtina, queen of Sweden, concerning a letter of her majeſty's, which he had mentioned in his journal, and which condemned the perſecution ſuffered by the proteſtants in France. This letter, he had ſaid, was "the remainder of the Proteſtant religion in her." This expreſſion had given ſome ſlight offence to the queen, and Bayle addreſſed to her a letter of apology. In an ample reply the queen declared her ſatisfaction with his excuſes; and adds, "I will lay a penance upon you which is, that for the future you ſend me all the curious books, in French, Latin, or Italian, upon all kinds of ſciences and all ſorts of ſubjects, provided they be worth reading." Her majeſty made no exception of romances or ſatires, and particularly requeſted books of chemiſtry, and the author's journal. Bayle was much affected by the revocation of the edict of Nantes, and the cruelties exerciſed againſt the proteſtants in France for the purpoſe of inducing them to abjure their religion. Upon this conduct he made ſome juſt and pointed reflections in his journal; and in 1686, he publiſhed a pamphlet, entitled, "Ce que c'eſt que la France toute Catholique ſous le regne de Louis le grand," or, a character of France, become entirely catholic under Louis the great. It was publiſhed without his name; and contained very ſevere cenſures on the treatment which the proteſtants received, as well as on the iniquity and folly of all attempts to procure converſion by force. This was ſoon followed by his famous work, intitled, "Commentarie Philoſophique," &c.; or, a Philoſophical Commentary on the words "Compel them to come in." This work was an elaborate defence of toleration, which formed the firſt part of it; and in the ſecond the author anſwers all the objections againſt it. It was followed in the next year by a third part, containing a confutation of St. Auguſtin's apology for perſecution. The free ſentiments expreſſed in this work gave offence to Jurieu; and though he was ignorant of the author, who had taken pains to conceal his name, he wrote a treatiſe againſt it. Bayle's health was ſo much impaired by the application devoted to the compoſition of his commentary, and probably alſo by the vexation occaſioned by his controverſy relating to queen Chriſtina, that he found it neceſſary to diſcontinue his literary journal, in the conduct of which he had obtained numerous teſtimonies of approbation, not only from private perſons, but from ſeveral ſocieties of learned men, and particularly from the French Academy and the Royal Society of England. His ſituation alſo at Rotterdam became unpleaſant to him, on account of the quarrelſome diſpoſition of Jurieu and ſome other circumſtances; and he wiſhed to leave it: but diſappointed in his views of a removal to Berlin, he was under a neceſſity of continuing at Rotterdam. In 1688, Bayle publiſhed a fourth part of his philoſophical commentary, in which he examined and confuted the perſecuting principles maintained by Jurieu in his two treatiſes intitled "Vrai Syſteme de l'Egliſe," and "Droits des deux Souverains." Another circumſtance alſo occurred which ſerved to widen the breach between them. Jurieu, in his interpretation of ſome of the ſcripture prophecies, had preſaged the approaching triumph of the proteſtants in France, and he had publiſhed ſome free opinions, with a view of preparing the people for this great revolution, on the right of ſubjects to reſiſt by force of arms the tyranny of ſovereigns over their conſciences. Among other books that were written in order to counteract the effect of Jurieu's publication, the moſt remarkable was a treatiſe, intitled, "Avis aux Refugiez," or Important Advice to the Refugees, concerning their approaching return into France, and printed in 1690. The author perſonated a catholic, and his name was concealed; but Jurieu, attributing it to Bayle, was much incenſed, and took occaſion to attack his religious and political character, publicly accuſed him before the magiſtrates of Rotterdam, and attempted to get him diſmiſſed from his profeſſorſhip. Bayle made a ſpirited defence, and his cauſe was eſpouſed by ſeveral able writers. The magiſtrates conducted themſelves with impartiality and moderation; and the diſpute ſubſided. Although Mr. Bayle denied his having been the author of the above mentioned treatiſe, there i reaſon to believe that the ſuſpicions and charges of Jurieu and others were not unfounded. Bayle had been accuſtomed to write under fictitious characters, and on oppoſite ſides of the ſame queſtion; and this is a circumſtance which has been alleged, and not without reaſon, againſt his character. Beſides, it is not unlikely that national prejudice and early attachment might have induced him to vindicate the rights and intereſts of the French monarchy. However this be, he was afterwards ſuſpected of being concerned in an intrigue to bring about a ſeparate peace between France and the United States; and king William, dreading the conſequences of this project of peace, gave orders to the magiſtrates of Rotterdam to deprive him of his profeſſorſhip and of his penſion. This event took place in November 1693; and Mr. Bayle, declining offers that were made him of entering into new engagements, lived in retirement.

The project of his "Critical Dictionary" had been announced in 1690: and in 1692, his plan, under the title of "Projet et Fragmens d'un Dictionaire Critique;" but as it was diſapproved by the public, he commenced the work, as it has ſince appeared, on a new plan. Accordingly the firſt volume appeared in Auguſt 1695. Such was the favourable expectation entertained concerning this work, that the duke of Shrewſbury, an Engliſh nobleman, diſtinguiſhed by his talents as well as by his high rank and employments, expreſſed a wiſh to have it dedicated to him, and by means of Mr. Baſnage offered Bayle 200 guineas as an acknowledgment for this diſtinction. Mr. Bayle declined the offer, and maintained his independence. The ſecond volume, which completed the firſt edition, though it has ſince appeared in a more enlarged form, was printed in 1697; and the ſale of the whole was uncommonly rapid and extenſive. Whilſt Bayle profeſſed to ſupply the numerous defects of Moreri's dictionary, and to correct its errors, it ſeems to have been his real purpoſe "to make his dictionary a kind of common place for all the critical and philoſophical knowledge, all the curious information as to fact, and all the ſubtlety of argu-

argumentation he had ſpent his life in acquiring." The text is conciſe; but the notes, which contain much valuable information, are ſpun out to a tireſome and unintereſting length. This dictionary, generally ſo well received, and containing a variety of unexceptionable matter, diſplayed freedoms of ſeveral kinds, both as to ſentiment and diction, which were not likely to eſcape cenſure. Jurieu, the avowed and implacable antagoniſt of Bayle, attacked it from the preſs, and endeavoured to procure its condemnation from the eccleſiaſtical aſſemblies. The conſiſtory of the Walloon church of Rotterdam contented itſelf with the detail of ſeveral objections againſt particular articles, for which indeed no ſatisfactory apology can be offered; but ſatisfied with Mr. Bayle's promiſe of amendment in a ſecond edition, they proceeded no further. In 1702, Mr. Bayle publiſhed a ſecond edition, with many additions. In the following year he wrote a volume entitled, "Réponſe aux Queſtions d'un Provincial," containing an entertaining and inſtructive variety of hiſtorical, critical, and literary obſervations, to which he added a ſecond and third volume in 1705, and a fourth in 1706. In 1704, he publiſhed "A Vindication of his Thoughts on Comets," which involved him in new diſputes, particularly with the ingenious and learned Le Clerc. With his fame his adverſaries multiplied; and attempts were made to prejudice lord Sunderland, the Engliſh miniſter of ſtate, againſt him, and to procure his excluſion from the United States, as a man who was not only an enemy to religion, but chargeable with treaſon againſt the government. The ſtorm, however, was diverted by the influence of lord Shaftesbury. He was offered at this time a liberal proviſion and hoſpitable refuge by ſeveral perſons of diſtinction in England; but he declined all theſe generous propoſals. The decline of his health made him averſe from changing his ſituation; and towards the cloſe of the year 1706, he was reduced by a pulmonary diſorder, which was hereditary, to a very weak ſtate. The approaches of death were regarded by him with philoſophical firmneſs, nor did he intermit his literary labours to the laſt period of his life. In the morning of December 28, 1706, when his landlady entered his chamber, he aſked her in a faint voice if his fire was kindled, and immediately expired; having attained the age of ſomewhat more than 59 years.

By his panegyriſts, Mr. Bayle's talents, learning, and powers of reaſoning have been unduly extolled; by his adverſaries they have been no leſs unjuſtly degraded. M. le Clerc, who belongs to the latter claſs, and whoſe judgment is evidently biaſſed by prejudice, has not allowed him the merit to which he is unqueſtionably entitled. He repreſents him as ſo ignorant of geometry, that, according to his own confeſſion, he could never underſtand the demonſtration of Euclid's firſt problem, and as having written in the latter period of his life againſt the evidence of mathematical demonſtration. As a reaſoner, he ſays, he had no ſettled principles, and he argued only with a deſign to puzzle the unlearned readers. His arguments, he adds, contain much more froth and empty words than ſound reaſoning. He was unacquainted with the books written in England upon experimental philoſophy, and underſtood only a little of the philoſophy of Des Cartes. He had peruſed only a few tranſlations of Engliſh books upon metaphyſical ſubjects. His knowledge of divinity was derived from his catechiſm, from ſermons, or from a few French books. In eccleſiaſtical antiquity, and in that of Greece and Rome, he was indifferently ſkilled; law and phyſic were to him hidden treaſures; and his knowledge of modern hiſtory was partial and imperfect. He had collected with great labour a thouſand literary trifles and inconſiderable circumſtances; and though he wrote in a very agreeable manner, it was only when he was not in a paſſion. Saurin ſays of him, that he was one of thoſe extraordinary men, whoſe oppoſite qualities leave room to doubt whether we ought to look upon him as the beſt or the worſt of men. On the one hand, he was a great philoſopher, knowing how to diſtinguiſh truth from falſehood, and perceiving at one view all the conſequences of a principle and their connection; and on the other hand, a great ſophiſt, confounding truth with falſehood, and deducing falſe inferences from his aſſumed principles. On the one hand, a man of learning and knowledge, who had read all that can be read, and remembered all that can be remembered; and on the other, ignorant, or feigning ignorance, with regard to the moſt common ſubjects, propoſing difficulties which have been a thouſand times ſolved, and urging objections which a ſchool-boy could not make without bluſhing. On the one hand, attacking the moſt eminent men, opening a large field for their labours, and giving them a great deal of trouble to vanquiſh him; and on the other, uſing the worſt authors, to whom he was laviſh of his praiſes, and diſgracing his works by ſuch names (meaning probably Brantome and Rabelais) as a learned mouth never pronounced. On the one hand, free at leaſt in appearance, from all the paſſions which are inconſiſtent with the ſpirit of Chriſtianity, grave in his diſcourſes, temperate in his diet, auſtere in his manner of living; and on the other, employing all the ſtrength of his genius to overthrow the foundations of moral virtue, and attacking as much as lay in his power, chaſtity, modeſty, and all the Chriſtian virtues. On the one hand, appealing to the throne of the moſt ſevere othodoxy, going to the pureſt ſprings, and borrowing his arguments from the leaſt ſuſpected writers; and on the other, following the paths of heretics, propoſing again the objections of the ancient hereſiarchs, lending them new arms, and collecting together in one age all the errors of paſt ages. The eloquent preacher cloſes this detail with the following benevolent wiſhes: "May that man, who had been endowed with ſo many talents, be acquitted before God of the ill uſe he made of them! May that Jeſus, whom he ſo often attacked, have expiated his ſins!"

Voltaire, ſpeaking of his Critical Dictionary, ſays, "It is the firſt work of the kind in which a man may learn to think." He cenſures, however, thoſe articles which contain only a detail of minute facts, as unworthy either of Bayle, an intelligent reader, or poſterity. "In placing him," adds this author, "among the writers who do honour to the age of Louis XIV. although a refugee in Holland, I only conform to the decree of the parliament of Toulouſe; which, when it declared his will valid in France, notwithſtanding the rigour of the laws, expreſsly ſaid, "that ſuch a man could not be conſidered as a foreigner." "Without a country, or a patron, or a prejudice," ſays Gibbon in his "Miſcellaneous Works," "Bayle claimed the liberty, and ſubſiſted by the labours of his pen." The inequality of his voluminous works is explained and excuſed by his alternately writing for himſelf, for the bookſellers, and for poſterity; and if a ſevere critic would reduce him to a ſingle folio, that relic, like the books of the Sibyl, would become ſtill more valuable. The ancient paradox of Plutarch, continues this writer, that atheiſm is leſs pernicious than ſuperſtition, acquires a tenfold vigour when it is adorned with the colours of his wit, and pointed with the acuteneſs of his logic. His "Critical Dictionary" is a vaſt repoſitory of facts and opinions, and he balances the falſe religions in his ſceptical ſcales, till the oppoſite quantities, adopting the language of algebra, annihilate each other. The wonderful power which he ſo boldly exerciſed of aſſembling doubts and objections had tempted him jocoſely to aſſume the title of the νεφελαγερέτα Ζεύς, *the cloud-compelling Jove;* and in a converſation with the

the ingenious abbé, afterwards cardinal, de Polignac, he freely disclosed his universal Pyrrhonism. "I am truly (said Bayle) a protestant, for I protest indifferently against all systems and all sects."

Upon the whole we may observe, that in private life Mr. Bayle was sober and temperate, modest and unassuming, disinterested and sincere. As a writer, his sentiments were fluctuating and sceptical, and he is not unjustly placed at the head of modern sceptics. Although he often takes pleasure in propagating his doubts, and perplexing his readers with a contrariety of opinions, yet he frequently combats hurtful prejudice and unwarrantable dogmatism. In many articles of his Dictionary, it does not appear to what country, sect, or persuasion he belongs; and this circumstance has been regarded by some persons as constituting a qualification for historical discussion. For the pruriency of his ideas, for his notorious want of delicacy, and for his disposition to introduce offensive topics, his most partial advocates will find it difficult to devise an apology. The pernicious tendency of his sceptical system, with regard to religion and society, is well exposed by lord Lyttleton in his "Dialogues of the Dead," Dial. 24. Works, vol. ii. p. 315. "You have endeavoured," says this excellent writer, personating Locke, "and with some degree of success, to shake those foundations, on which the whole moral world, and the great fabric of social happiness, entirely rest; how could you, as a philosopher, in the sober hours of reflection, answer for this to your conscience, even supposing you had doubts of the truth of a system, which gives to virtue its sweetest hope, to impenitent vice its greatest fears, and to true penitence its best consolations; which restrains even the least approaches to guilt, and yet makes those allowances for the infirmities of our nature, which the stoic pride denied to it, but which its real imperfection, and the goodness of its infinitely benevolent Creator, so evidently require?" As to his style of writing, it is natural and lively, but not always correct, and inclining to prolixity; and his manner is rather satirical and humourous, than inflammatory. The best editions of his Dictionary are those of 1720 and 1740. The English translation of Mr. de Maizeaux is reckoned a good one. A new and accurate translation of Bayle's dictionary is incorporated in the "General Dictionary, Historical and Critical," with reflections on such passages of Mr. Bayle, as seem to favour scepticism and the Manichee system. Maizeaux's Life of Bayle. Gen. Dict. Gen. Biog.

Bayle, Francis, many years professor in medicine and philosophy at Toulouse, and author of numerous learned and ingenious works, died September 24th, 1709, aged 87 years. The most esteemed of his productions are, "De Menstruis Mulierum," "Sympathia partium corporis humani cum utero, usu lactis ad tabidos," &c. Tolos. 1670. 4to. He attributes the menstrual flux to a fermentation occurring periodically in the mucous sinuses in the uterus, distending and opening their mouths, which collapse and close as soon as the fermentation subsides; a notion as philosophical as the periodical plethora of Friend. "Dissertationes physicæ sex," Tolos. 1677, 12mo. The third dissertation is on physiognomy, in which the author had faith, as well as in the power of the imagination of the mother, in marking and mutilating the fœtus in utero. "Discours sur l'experience et la raison," Paris, 1675, 12mo. He here asserts the superiority of experience over theory in medicine. "Histoire d'un enfant qui a demeuré 25 ans dans le ventre de sa mère," Tolos. 1678, 12mo. The fœtus was found uncorrupted, surrounded by a firm crust or shell. For the titles of the remainder of this author's works, which were collected and published in four volumes, 4to. in the year 1701, at Toulouse, see Hall. Bib Anat. & Floy's Dict. Hist

Bayle, in *Fortification*, the space outside the ditch of our ancient fortresses, commonly surrounded by strong palisades, and sometimes by a low embattled wall.

Bayly, Lewis, in *Biography*, an English bishop in the reign of James I., was born at Carmarthen, in South Wales, and educated at Oxford. Being an eminent preacher, he was appointed one of the king's chaplains, and promoted to the see of Bangor in 1616. In 1621 he was committed to the Fleet, probably on account of his concern in prince Henry's match with the Infanta of Spain. He died in 1632, and was buried in the church of Bangor. This prelate was the author of a famous piece called "The Practice of Piety," which has been so popular that the edition of 1734 was the 59th. It was translated into Welsh and also into French in 1733; and a complaint was alleged against it, that the common people regarded its authority as equal to that of the Bible. Biog. Brit.

BAYNA, in *Geography*, a town of Hungary, in the Bodok district, the inhabitants of which are principally farmers and husbandmen.

BAYNES, a town of France, in the department of the Calvados, and chief place of a canton, in the district of Bayeux, 3¼ leagues W.S.W. of Bayeux.

BAYNET, a town and bay on the south side of the island of St. Domingo, 4½ leagues from Petit Guave, on the north side of the island, and about 8 leagues west of Jackmel. N. lat. 18° 17′.

BAYON, a town of France, in the department of the Meurte, and chief place of a canton in the district of Luneville, seated on the Moselle. The place contains 793 and the canton 7657 inhabitants, on a territory of 195 kiliometres including 25 communes. N. lat. 48° 30′. E. long. 14° 42′.

BAYONA, a sea-port town of Spain in Gallicia, situated in a small gulf, near the mouth of the Minho, with a convenient harbour. The coast near it abounds with excellent fish; and the land, watered by many springs, is fertile. N. lat. 42° 15′. W. long. 9° 30′.

Bayona *Bay* and *Islands*, lie on the south part of the great bay of Vigo, and to the east of cape Passelis, on the west coast of Spain, in the Atlantic ocean. The bay forms the harbour of the town of Bayona. The two islands are situated a little to the west of north from the town. They were anciently called "Insulæ Deorum," or the isles of the Gods. A large rock, with many small ones about it, lies at the south end of Bayona islands.

BAYONET, in the *Military Art*, signifies a short broad dagger, used by all modern armies, since the sword has been laid aside, as a necessary appendage to the infantry. The origin of the term is not correctly known; but is most probably derived from having been first manufactured at the city of Bayonne, or originally invented by an engineer of that place.

Bayonets were formerly made with a round handle, adapted to the bore of a firelock, so as to be fixed there after the soldier had discharged his piece. They are now constructed with iron handles and rings which go over the muzzle of the firelock, and are screwed fast; thus enabling the soldier to fire and load with his bayonet fixed, and ready to act, if necessary, against horse. This is particularly of service to dragoons and fusileers, after they have expended all their powder and ball.

The use of the bayonet fastened on the muzzle of the firelock was a great improvement, first introduced by the French, and to which, according to the chevalier de Folard, (Comm. sur. Polyb. vol. i. p. 135. edit Paris,, 1727), they owed in a great measure their victories obtained in the war of 1689. To its neglect in the next war, the same writer attributes most of the losses they sustained. It is to marshal Catinat, the French are indebted for the great superiority they

they poſſeſs in the management of this weapon. During greater part of the ſeventeenth century, one-half of a battalion was armed with pikes, the other carried muſquets; but the feeble effect of theſe laſt, and the frequent miſſing fire from the aukward uſe of matchlocks, ſuggeſted the improvement of firelocks with bayonets, which unite the two arms in the moſt effectual manner.

The battle of Marſaglia, in 1693, was the firſt occaſion on which Catinat put this improvement in practice, againſt the Spaniards and Savoyards. The French infantry marched boldly up to the enemy, received their fire, and without returning a ſhot, charged furiouſly with their bayonets. The ſlaughter was horrible, and the route of the allies complete. The ſame method was adopted by marſhal Tallard at the battle of Spires in 1703: and by the duc de Vendôme at the battle of Calcinato in Italy, in 1705. On both occaſions ſucceſs was the ſame as in the former inſtances. Of late the bayonet has come into very general uſe; and battles of importance have been gained by it without the diſcharge of a muſquet. The late king of Pruſſia, although he relied greatly on the running fire which he taught his troops to practiſe with ſuch terrible effect, yet highly recommended the charge with the bayonet as the moſt effectual means of throwing a wavering enemy into irreparable diſorder.

But the French, whoſe natural genius ſeems particularly adapted to the uſe of this weapon, have not only invented, but have alſo employed it with the moſt aſtoniſhing ſucceſs. In the laſt war, the favourite maxim of their generals, inſtead of loſing time by cannonading, and firing on the enemy with muſquetry, has been to bring the iſſue of the affair as early as poſſible to the point of the bayonet. The battles of Jemappe, Haguenau, and Ettingen, in particular, not to mention many others, were almoſt excluſively gained by it; and the Spaniards, throughout the dreadful conteſts between their own and the French forces, at the concluſion of the campaign of 1794, were uniformly defeated by the uſe of the bayonet alone.

BAYONNE, in *Geography*, a pleaſant ſea port town, on the weſtern coaſt of France, in a corner of the bay of Biſcay. It is the chief place of a diſtrict in the department of the lower Pyrenées, and ſituated at the conflux of the rivers Adour and Nive, about a league from the ſea, with a good harbour, and having a narrow and dangerous entrance. The Adour divides the ſuburb from the citadel, and through the town itſelf flows the river Nive. A wooden drawbridge, which admits veſſels to paſs, connects the ſuburb with the town. The ſtyle of the buildings at Bayonne is principally Spaniſh, with balconies at every window, and arcades before the houſes. From the "place de la Liberté," which is ſurrounded by very neat houſes, and appears very gay, a gate leads to a pleaſant promenade on the Adour. The trade of this town is very conſiderable, on account of its vicinity to Spain, and of the great quantity of wines which are brought hither from the adjacent country, and which the Dutch have been accuſtomed to take in exchange for ſpices and other commodities. Maſts are alſo brought from the Pyrenées by means of the Nive, the Gave of Oleron, and the Adour, to Bayonne, whence they are ſhipped to Breſt, and other ports. The common people generally ſpeak the old biſcayan or baſque language. At Bayonne, and in the neighbouring country, the young women are very beautiful, combining with a tall ſlender ſhape great ſymmetry of features, a fair complexion, and black lively eyes. Before the revolution Bayonne was the ſee of a biſhop, ſuffragan of Auch. In 1784, it was declared a free port. It is divided into the N.E. and N.W. cantons, the former containing 10,088 inhabitants in 5 communes, and the latter 10,750 in 4 communes. Each canton includes 65 kiliometres. The population of the place is ſaid to amount to 13,190 perſons. N. lat. 43° 29′ 21″. W. long. 1° 30′ 6″.

BAYS, in *Commerce*, a kind of coarſe, open, woollen ſtuff, having a long knap; ſometimes frized on one ſide, and ſometimes not frized, according to the uſes for which it is intended.

This ſtuff is without wale, being wrought on a loom with two treddles like flannel.—It is chiefly manufactured about Colcheſter, and Bocking in Eſſex; and in Flanders, about Lille and Tournay, &c.

This manufacture was firſt brought into England, together with that of ſays, ſerges, &c. by the Flemings, who fled hither from the perſecution of the duke of Alva, about the fifth year of the reign of queen Elizabeth, and had afterwards peculiar privileges granted them by the 12 Car. II. in 1660. The exportation of bays was formerly much more conſiderable than it is now, as the French manufacturers have learned to imitate them, and have ſet up manufactures of their own at Niſmes, Montpelier, &c. However, a conſiderable quantity of bays is ſtill exported to Spain, Portugal, and Italy. Their chief uſe is for the religious, and for linings in the army; the looking-glaſs makers alſo uſe them behind their glaſſes, to preſerve the tin or quickſilver; and the caſe-makers to line their caſes.

The breadth of bays is commonly a yard and half, yard and three quarters, or two yards; by forty-two, or forty-eight in length: thoſe of a yard and three quarters are moſt proper for the Spaniſh trade.

BAYS, in *Geography*, a town of France, in the department of the Mayenne, and chief place of a canton, in the diſtrict of Mayenne, 3½ leagues E.S.E. of Mayenne. The place contains 2,100, and the canton 14,470 inhabitants; in an extent of 192¼ kiliometres and 9 communes.

BAZA, or BAZAT, in *Commerce*, fine ſpun cotton, which comes from Jeruſalem, whence it is alſo called Jeruſalem cotton.

BAZA, in *Geography*, a town of Germany, in the duchy of Carniola, 7 miles S.S.W. of Feldes.

BAZA, or *Baça*, a town of Spain, in the province of Granada, between Guadix and Hueſcar, ſuppoſed to be the ancient Baſti. N. lat. 37° 31′. W. long. 2° 31′.

BAZADOIS, a diſtrict of the province of Guyenne, before the revolution, ſituated between Agenois, Condomois, and Guyenne. The ſoil is ſandy and unproductive. The capital is Bazas.

BAZAR, or BASAR, in *Commerce*, a denomination among the Turks and Perſians, given to a kind of exchanges or places where their fineſt ſtuffs and other wares are ſold. They are alſo called *bezeſtins*.

The word bazar ſeems of Arabic, or rather of Perſian and Turkiſh origin, where it denotes *ſale*, or exchange of goods.

Some of the eaſtern bazars are open, like the market-places in Europe, and ſerve for the ſame uſes, more particularly for the ſale of the more bulky and leſs valuable commodities. Others are covered with lofty ceilings, or even domes pierced to give light; and it is in theſe the jewellers, goldſmiths, and other dealers in the richer wares, have their ſhops.

The bazar or maidan of Iſpahan is one of the fineſt places in all Perſia, and even ſurpaſſes all the exchanges in Europe; yet, notwithſtanding its magnificence, it is excelled by the bazar of Tauris, which is the largeſt that is known, having ſeveral times held thirty thouſand men ranged in order of battle.

At Conſtantinople there are the old and the new bazar, which are large, ſquare buildings, covered with domes, and ſuſtained by arches and pilaſters; the former chiefly for arms, harneſſes, and the like; the latter for goldſmiths, jewellers, furriers, and all ſorts of manufactures. For an account of the bazars of Aleppo, ſee ALEPPO.

BAZAR, or *Bazaar*, a town of Hindooſtan, 20 miles N.E. of

of Attock, ſeated near the Indus, Nilab or Sinde river. N. lat. 33° 45′. E. long. 71° 18′.

BAZARUTO, or Bocica *iſlands*, lie off the ſouth-eaſt coaſt of Africa, in the Indian ocean, oppoſite to Asuca bay. S. lat. 21° 55′. E. long. 34° 30′.

BAZAS, a city of France, and principal place of a diſtrict, in the department of the Gironde, before the revolution the capital of Bazadois, and ſee of a biſhop. It is ſeated on a rock. The place contains 4215, and the canton 9,862 inhabitants, in 13 communes and a territorial extent of 210 kiliometres. N. lat. 44° 26′. W. long. 0° 30′.

BAZEILLE, St., a town of France, in the department of the Lot and Garonne, in the diſtrict of Marmande, ¼ league N. W. of Marmande.

BAZGENDGES, in *Natural Hiſtory*, the name of a ſubſtance uſed by the Turks, and other eaſtern nations, in their ſcarlet dyeing: they mix it for this purpoſe with cochineal and tartar, the proportions being two ounces of the bazgendges to one ounce of cochineal.

The bazgendges ſeem to be no other than the horns of the turpentine tree in the eaſtern parts of the world; and it is not only in Syria that they are found, but China alſo affords them. Many things of this kind were ſent over to M. Geoffroy at Paris from China, as the ſubſtances uſed in the ſcarlet dyeing of that country, and they all proved wholly the ſame with the Syrian and Turkiſh bazgendges, and with the common turpentine horns. The lentiſk or maſtic tree is alſo frequently found producing many horns, of a like kind with theſe, and of the ſame origin, all being owing to the *pucerons*, which make their way into the leaves, and breed their young there. Reaumur's Hiſt. of Inſects, vol. vi. p. 37.

BAZIEGE, in *Geography*, a town of France, in the department of the upper Garonne, and chief place of a canton, in the diſtrict of Villefranche, 4 leagues S.E. of Toulouſe.

BAZIN, Niccolas, in *Biography*, a French phyſician and correſponding Member of the accademy of Sciences at Paris, graduated at Straſbourg, where he afterwards reſided, and acquired conſiderable reputation as a practitioner in medicine, though his attention was principally turned to the ſtudy of natural hiſtory, which he enriched with the following valuable productions. "Obſervations ſur les plantes, et ſur leur analogie avec les inſectes," Straſbourg, 1741, 8vo. He believed that plants reſpired, and that the juices abſorbed by them for their nouriſhment were digeſted, or concocted in the root, prior to their diſtribution. "Hiſtoire des Abeilles," 2 vols. 12mo. Paris, 1744. "Lettre au ſujet des animaux, appellés polypes," 1745, 12mo. He died in March 1754. Hall. Bib. Bot. Eloy. Dict. Hiſt.

BAZIRA, in *Ancient Geography*, now *Bijore*, a diſtrict of a territory adjoining to the country of the Aſſaceni, or Aſſacani, correſponding to the preſent Sewad or Sowhad, between the rivers Bijore and Penjekoreh in Hindooſtan. When Alexander had taken Maſſaga, the capital of the Aſſaceni, by aſſault, he ſummoned Bazira, the capital of the next adjacent territory; and the modern diſtrict of Bijore preſents itſelf in a poſition that anſwers moſt unequivocally to that of Bazira; and the ſimilarity of their names is no leſs ſtriking. See Bijore.

BAZIRGION, a town of Perſia, in the province of Lariſtan, 57 miles eaſt of Lar.

BAZIUM, a promontory of Egypt, on the weſtern coaſt of the Red Sea. Ptolemy.

BAZOCHE, or Basoche, in *Law*, formerly a royal kind of juriſdiction exerciſed among the clerks of the palais, or courts of juſtice at Paris. It was adminiſtered in the name and by the authority of the king of *Bazoche, roi de la Bazoche*, by virtue of an ancient grant of the kings of France; the elder among the clerks were the officers; and he who preſided was the chancellor. This court only took cognizance of cauſes among the clerks, or between clerks and artificers for goods bought, or work done. The freedom they exerciſed with regard to private characters in their inquiſition and remonſtrances, occaſioned ſeveral arrets to reſtrain their power, and prohibit their holding pleas without leave.

A collection of ſtatutes, ordonnances, regulations, monuments, and prerogatives of the kingdom of Bazoche, was publiſhed at Paris in 1654, 8vo.

Bazoche, La, in *Geography*, a town of France, in the department of the Eure and Loire, and chief place of a canton, in the diſtrict of Nogent le Rotrou, 5 miles S.E. of Authon.

Bazoches, *les-Gallerands*, a town of France, chief place of a canton, in the department of the Loiret; the place contains 1,046, and the canton 11,289 inhabitants, in 26 communes, and a territory including 305 kiliometres.

Bazoches *ſur-Hoëſne*, a town of France, in the department of the Orne, and chief place of a canton, in the diſtrict of Mortagne, 9 miles N.W. of Argentan. The place contains 1,349 and the canton 7,229 inhabitants, in 14 communes, and on a territory of 122½ kiliometres.—Alſo, a town of France, in the department of the Aiſne, and chief place of a canton, in the diſtrict of Soiſſons, 4 leagues E. of Soiſſons.

BAZOGE, La, a town of France, in the department of the Sarte, and chief place of a canton, in the diſtrict of le Mans, ſix miles N. of le Mans.

BAZOUGERS, a town of France, in the department of the Mayenne, and chief place of a canton, in the diſtrict of Laval, 2½ leagues S.E. of Laval.

BAZOUGES la Perouse, a town of France, in the department of the Ille and Vilaine, and chief place of a canton, in the diſtrict of Dol, 3¼ leagues S.S.E. of Dol.

BDELLIUM, βδέλλιον, an aromatic gum, brought from the Levant, of ſome uſe, both as a medicine and a perfume.

The word is ſuppoſed to have been formed of the Hebrew בדלח, *bedollach*, which the Engliſh tranſlators render by the appellation *bdellium*. It is alſo writen *bedellium*, *bedello*, *ptellium*, *petallium*, *megalium*, and *telinum*.

There is much uncertainty concerning both the plant and the place of its production, which is ſuppoſed to be in Africa. We find mention of the name both among the ancient naturaliſts, and in Scripture; but it is doubtful whether any of theſe be the ſame with the modern kind. As for the Scripture bdellium, we know very little of it. Moſes deſcribes manna as of the colour of bdellium; and Joſephus explains the paſſage, by ſaying it is the gum of a tree reſembling the olive tree; and that the manna wherewith the Jews were fed in the deſert reſembled this drug.—But Scaliger and others ſet aſide this explication, and own they do not know what the bdellium mentioned in Scripture is.

The bdellium of the moderns is a gum-reſin in irregular brittle maſſes, of a deep brown when broken, interſperſed with more tranſparent parts; and mixed with ſmall twigs and other accidental impurities Its external appearance a good deal reſembles myrrh The ſmell of this gum-reſin is ſomewhat fragrant, and its taſte ſomewhat bitter and pungent. It grows ſoft and tenacious when chewed. It burns with eaſe, giving a fragrant ſmoke and a crackling noiſe. It is partly ſoluble in alcohol, and partly in water, or completely (the impurities excepted) in diluted ſpirit. By Neuman's experiments only about one-ſixth is pure reſin. The watery ſolution is ſea-green, the ſpirituous red. Diſtilled with water it impregnates the liquid with its flavour, but it does not yield any ſenſible quantity of eſſential oil, when only a moderate quantity is uſed.

Bdellium was formerly employed as a ſtimulating remedy, chiefly for external application, and is ſtill retained in ſome of the warm plaſters of the Paris diſpenſatories. It is entirely diſuſed here, and ſeldom to be ſeen in the ſhops. It reſembles myrrh in its properties, but leſs in degree, and is very deſervedly neglected. Murray. Lewis. La Grange Elem. de Pharm.

BEACH FORK, in *Geography*, a branch of Salt river, which riſes in Nelſon county, Kentucky, in America. On this river is found a fine clay, which it is thought might be manufactured into good porcelain.

BEACHY-HEAD, is a bold promontory which projects into the Engliſh channel on the Suſſex coaſt, between Haſtings and Shoreham. This commanding headland conſiſts of alternate ſtrata of chalk and flint; though the latter is only ſeen in thin layers or veins. "It is eſteemed," ſays Camden, "the higheſt cliff of all the ſouth coaſt of England;" and on its ſouth ſide is a large ſemicircular intrenchment. It is divided into ſeven cliffs, and ſo called by ſeamen. The coaſt round this head is very dangerous in ſtormy weather, particularly when the wind ſets in from S.S.E. or S.W. From this promontory to Arundel, the country along the coaſt riſes into high hills, which are known by the name of South-downs, and celebrated for their ſheep walks. Beachy-head is memorable for the defeat of the Engliſh and Dutch fleets near it by a ſuperior force of the French, June 30th, 1690. N. lat. 50° 44′ 30″. E. long. 0° 19′ 40″. See EASTBOURNE.

BEACHY-HEAD, lies alſo on the eaſtern coaſt of South America, in Patagonia, about S.S.W. from Port Julian, and N.N.E. from cape Fairweather. S. lat. 50° 21′. W. long. 67° 40′.

BEACON, a ſignal for the better ſecuring of the kingdom againſt foreign invaſion.

Different methods have been taken in different countries, both anciently and of later ages, to convey the notice of any impending danger to diſtant places with the greateſt expedition. But no kind of ſignals has more generally prevailed than that of fires in the night. That this was practiſed among the Jews we learn from the ſacred writers. Hence the prophet Iſaiah, in alluſion to that cuſtom, threatens them that they ſhould be left "as a Beacon upon the top of a mountain, and as an enſign on a hill." (chap. xxx. 17.) And in the like manner Jeremiah alarms them by ſaying, "Set up a ſign of fire in Beth-haccerem, for evil appeareth out of the north, and great deſtruction;" (chap. vi. 1.) And as to other countries, Ariſtotle (de Mundo) informs us, that theſe ſignals were ſo diſpoſed on towers through all the territories of the king of Perſia, that in the ſpace of twenty-four hours he could receive advice at Suſa and Ecbatana, his two capital cities, of any commotions or diſturbances that might be raiſed in the moſt diſtant parts of his dominions. But the Greeks, as Thucydides relates, made uſe of torches for ſignals, which by a different management ſerved either to give notice of the approach of an enemy or the arrival of a friend to their aſſiſtance. For as the ſcholiaſt ſays, in the former caſe "the torches were ſhook by thoſe who held them, and in the latter they were kept ſteady," (lib. xi. c. xciv. lib. iii. c. xxii.) Among the Greeks they were called φρυκτοι; and their uſe is particularly deſcribed in the Agamemnon of Æſchylus. The like cuſtom of nocturnal fires obtained alſo among the Romans, as appears from Cicero, where, ſpeaking of the miſconduct of Verres, when governor of Sicily, he ſays, "Non enim ſicut antea conſuetudo erat predonum adventum ſignificabat ignis e ſpecula ſublatus; ſed flamma ex ipſo incendio navium, et calamitatem acceptam et periculum reliquum nuntiabat: (lib. v. in Verrem, § 91.) Wherefore ſignals of this ſort are called by Pliny "ignes prænuntiativi" (Nat. Hiſt. lib. xi. § 73.) which he diſtinguiſhes from the Phari, or light houſes, that were placed upon the coaſts for the direction of ſhips; the latter of which were conſtant, but the former only occaſional.

Eſtabliſhed ſignals were repeated, ſays Charnock, in his "Miniature Architecture," by means of beacons or light-houſes erected in proper poſitions, from mountain to mountain, through a chain of ſtations, which are ſaid to have commanded an extent of more than 500 miles: ſo that even the inhabitants of Conſtantinople were capable of being informed, within the ſhort ſpace of a few hours, of any motions that might be attempted by their Saracen enemies in Tarſus.

In our own country, the name of beacon is derived from the Anglo-Saxon *beacnian*, to ſhew by ſign or beckon. It was uſually placed upon a high ground, and ſometimes on a tumulus. From lord Coke we learn (Fourth Inſtit. c. xxv. p. 184.) that before the reign of Edward the third, beacons were but ſtacks of wood ſet up on high places, which were fired when the coming of an enemy was deſcried; but in his reign pitched boxes were ſet up inſtead of them. In time of danger a watch was kept at them, and horſemen called hobbelars were ſtationed by moſt of them to give notice of an enemy's approach.

BEACONS are alſo marks and ſigns erected on the coaſts, for the guidance and preſervation of mariners at ſea by night as well as by day. The erection of beacons, light-houſes, and ſea-marks, both for alarming the country in caſe of the approach of an enemy, and for the direction and ſafety of ſhips, is a branch of the royal prerogative. For this purpoſe the king hath the excluſive power, by commiſſion under his great ſeal, to cauſe them to be erected in fit and convenient places, as well as upon the lands of the ſubject as upon the demeſnes of the crown; which power is uſually veſted by letters patent in the office of lord high admiral.

Nevertheleſs it muſt be underſtood that the power of erecting beacons was occaſionally given to individuals, and limited by grants from the crown, whence, or for ſome atchievements performed in times of danger, the beacon is worn as a creſt in the arms of ſeveral families, as Belknap, Butler, Mountford, Sudley, and Shelly of Michell Grove, one or two of whom obtained eſpecial grants which empowered them to erect and maintain beacons at their own expence.

The care of theſe, when erected by the crown, was committed to one or more of the adjacent hundreds; and the money due or payable for their maintenance, called *beconagium*, was levied by the Sheriff of the county upon each hundred. (Archæologia, vol. i. part 1. Hutchins's, Hiſt. of Dorſet. vol. i. p. lix. Camd. Brit. Edit. 1609. p. 196.)

By ſtat. 8 Eliz. c. 13. the corporation of the Trinity houſe are empowered to ſet up any beacons or ſea-marks wherever they ſhall think them neceſſary: and if the owner of the land or any other perſon ſhall deſtroy them, or ſhall take down any ſteeple, tree, or other known ſea-mark, he ſhall forfeit 100*l.* or in caſe of inability to pay it, ſhall be ipſo facto outlawed.

BEACONAGE, money paid towards the maintenance of a *beacon*. A ſuit for beaconage of a beacon ſtanding on a rock in the ſea may be brought in the court of admiralty, the admiral having an original juriſdiction over beacons. 1 Sid. 158.

BEACON HILL, in *Geography*. See HARWICH.

BEACONSFIELD, a ſmall market town of Buckinghamſhire, in England, at the diſtance of 23 miles N.W. from London. The town is built on high ground, whence ſome antiquaries have inferred, that it derived its name from a beacon formerly occupying this ſpot. The ſubſtratum no

which it ſtands is chiefly gravel, and the houſes are built with flints or brick, there being no ſtone quarries in this part of the county. Beaconsfield has little claim to popular attention, there being no particular hiſtorical events or antiquities attached to it. Here are a ſmall weekly market on Wedneſdays, and two annual fairs. Seated on the great public road between London and Oxford, it derives ſome advantages from travellers; but it has been particularly noted in the literary annals of this country, by the contiguous reſidences of Edmund Waller the poet, and Edmund Burke the politician, both of whom poſſeſſed eſtates near Beaconsfield, and the memories of both are commemorated by inſcriptions at the pariſh church. See WALLER, and BURKE.

About three miles eaſt of Beaconsfield is *Bulſtrode*, a ſeat of the duke of Portland. This ducal reſidence was formerly in the poſſeſſion of the Bulſtrode family, but reverting to the crown, was given by king William III. to William Bentinck, who had long been the conſtant attendant and faithful ſervant of that monarch, and who was created by him earl of Portland in 1689. From him it deſcended to the preſent nobleman, who has made conſiderable additions and improvements to the houſe and grounds. The former is a large irregular brick building, ſeated on a high knoll, in the centre of a fine park which abounds with venerable trees, and is diverſified with that variety of ſurface, which conſtitutes the foundation of the picturesque. This park contains about 800 acres, and in the eaſtern part of it is a large circular entrenchment enclofing an area of twenty acres. See Beauties of England and Wales, vol. i. 1801.

BEAD, BAGUETTE, Fr. in *Architecture*, a little round moulding, the diminutive, or rather the vulgar name of aſtragal. This moulding is generally found in the cornices of antique buildings, where it is uniformly carved with ornaments, ſometimes in the ſhape of a ſtring of beads, ſometimes a twiſted ribbon or a rope. See *Plate* XXI. of *Architecture*. Plain beads are very much uſed in modern joiners' and plaiſterers' work, as the mouldings of doors, ſtrutters, ſkirtings, impoſts, and cornices.

BEAD, in *Aſſaying*, the ſmall lump or maſs of pure metal ſeparated from the *ſcoriæ*, and ſeen diſtinct and pure in the middle of the coppel while in the fire.

Thus, in ſeparating ſilver from its ore by means of lead, the ſilver remains in form of a bead, when the lead, that had before aſſiſted in the operation, is reduced to *ſcoriæ*. In this proceſs, the bead of ſilver muſt be taken out of the coppel as ſoon as it is ſeen pure and fine, leſt growing cold, it ſhould be conglutinated to the coppel or litharge. This bead, when rightly made, is always porous underneath. Cramer.

BEADS are more particularly uſed among us for a ſort of glaſs necklace, made in imitation of the colour and figure of pearl.

BEADS are alſo uſed in ſpeaking of thoſe glaſs globules vended to the ſavages on the coaſt of Africa, thus denominated, becauſe they are ſtrung together for the convenience of traffic.

The common black glaſs of which beads are made for necklaces, &c. is coloured with manganeſe only; one part of manganeſe is ſufficient to give a black colour to near twenty of glaſs. Lewis's Comm. Phil. p. 422. See ARTIFICIAL PEARLS.

BEADS, in a religious ſenſe. See CHAPLET.

BEAD-*Roll*, among the Romiſh prieſts, a liſt or catalogue of ſuch perſons, for the reſt of whoſe ſouls they are obliged to rehearſe a certain number of prayers, &c. which are told by means of their beads.

BEAD-*Makers*, called by the French *paternoſtriers*, are thoſe employed in the making, ſtringing, and ſelling of beads. At Paris there are three companies of *paternoſtriers*, or *bead-makers*; one who make them of glaſs or cryſtal; another in wood and horn; and a third in amber, coral, jet, &c.

BEAD *Proof*, or *Double Proof*, terms uſed by our diſtillers, to expreſs that ſort of proof of the ſtandard ſtrength of ſpirituous liquors, which conſiſts in their having, when ſhaken in a phial, or poured from on high into a glaſs, a crown of bubbles, which ſtand on the ſurface ſome time after. This is eſteemed a proof that the ſpirit conſiſts of equal parts of rectified ſpirits and phlegm.

This is a fallacious rule as to the degree of ſtrength in the liquor; becauſe any thing that will increaſe the tenacity of the ſpirit, will give it this proof though it be under the due ſtrength. Our malt diſtillers ſpoil the greater part of their goods, by leaving too much of the ſtinking oil of the malt in their ſpirit, in order to give it this proof, when ſomewhat under the ſtandard ſtrength. But this is a great deceit on the purchaſers of malt ſpirits, as they have them by this means not only weaker than they ought to be, but ſtinking with an oil, which they are not eaſily cleared of afterwards.

On the other hand, the dealers in brandy, who uſually have the art of ſophiſticating it to a great nicety, are in the right when they buy it by the ſtrongeſt bead proof, as the grand mark of the beſt; for being a proof of the brandy containing a large quantity of its oil, it is, at the ſame time, a token of its high flavour, and of its being capable of bearing a very large addition of the common ſpirits of our own produce, without betraying their flavour or loſing its own.

We value the French brandy for the quantity of this eſſential oil of the grape which it contains, and that with good reaſon; as it is with us principally uſed for drinking as an agreeably flavoured cordial: but the French themſelves, when they want it for any curious purpoſes, are as careful in the rectification of it, and take as much pains to clear it from this oil, as we do to free our malt ſpirit from that nauſeous and fœtid oil, which it originally contains.

No judgment can be formed of brandies by the bead proof as to their mixed or adulterated, or their pure ſtate, farther than that they are likely to be moſt pure when they have the greateſt proportion of this oil, in regard to mixtures of other ſpirits. There are many occaſions where we want ſpirit, merely as ſpirit, and where any oil, whether ſweet or ſtinking, muſt be equally improper. Shaw's Eſſ. on Diſtillery.

BEAD *Tree*, in *Botany*. See MELIA.

BEADLE, or BEDELL, *Bedellus*, ſignifies a meſſenger or apparitor of a court, who cites men to appear and anſwer in the court to what is alledged againſt them.

BEADLE is alſo uſed for an officer in univerſities, whoſe place it is to walk before the maſters at all public proceſſions, &c. with a mace. The office of church and pariſh beadles is well known.

Spelman, Voſſius, and Somner, derive *beadle* from the Saxon *bidel*, *a public crier*; in which ſenſe biſhops, in ſome ancient Saxon manuſcripts, are called *beadles of God*, *Dei bedelli*. The tranſlator of the Saxon New Teſtament renders *exactor* by *bidele*; and the word is uſed in the ſame ſenſe in the laws of Scotland.

BEADLE *of the Foreſt*, is an officer, that warns all the courts of the foreſts, and executes proceſs, makes all proclamations, &c. 4 Inſt. 313.

BEAGLE, in *Zoology*. See CANIS FAMILIARIS, and DOG.

Beagles are of divers kinds; as the *ſouthern beagle*, ſomething leſs and ſhorter, but thicker than the deep-mouthed hound; the *fleet northern*, or *cat beagle*, ſmall and of a finer ſhape than the ſouthern, and a harder runner. From the two,

two, by croſſing the ſtrains, is bred a third ſort held preferable to either.

To theſe may be added a ſtill ſmaller ſort of beagles ſcarce bigger than lap-dogs, which make pretty diverſion in hunting the coney, or even ſmall hare in dry weather: but otherwiſe unſerviceable, by reaſon of their ſize. Beagles, both rough and ſmooth, have their admirers among ſportſmen: their tongues are muſical, and they go faſter than the ſouthern hounds; they run ſo cloſe to the ground, as to enjoy the ſcent better than taller dogs, eſpecially when the atmoſphere is low. In an incloſed country they are ſaid to do beſt, as they are good at trailing or default, and for hedge-rows; but they require a clever huntſman, for out of eighty couple in the field, during a winter's ſport, ſcarcely four couple are to be depended upon. Of the two ſorts, the wire-haired, as having good ſhoulders and being well filletted, are preferred. Smooth haired beagles are commonly deep hung, thick-lipped, with large noſtrils, but often ſo ſoft and bad quartered, as to be ſhoulder-ſhook and crippled the firſt ſeaſon they hunt; among them are frequently ſeen crooked legs, like the Bathturnſpit; and after two hours running many of them are diſabled. Their form and ſhape ſufficiently denote them not deſigned for hard exerciſe. Daniel's Rural Sports, vol. i. p. 378.

BEAK, *Roſtrum*, in *Ornithology*, the bill of a bird; from the form and ſtructure of which, Linnæus divides this whole family or general claſs of animals into ſix orders. See Bird and Ornithology.

Beak, in *Architecture*, a little fillet left on the edge of a lannier, which forms a canal, and makes a kind of pendant chin, anſwering to what Vitruvius calls the *mentum*.

Beak, or *Beak-Head of a Ship*, is that part without the ſhip before the forecaſtle, which is faſtened to the ſtem, and is ſupported by the main knee: this is uſually carved and painted, and, beſides its uſe, makes the becoming part, or grace of a ſhip.

The beak was anciently made of wood, but fortified with braſs, and faſtened to the prow, ſerving to annoy the enemies' veſſels. Its invention is attributed to Piſæus, an Italian. The firſt beaks were made long and high; but afterwards a Corinthian, named Ariſto, contrived to make them ſhort and ſtrong, and placed ſo low as to pierce the enemies' veſſels under water. By the help of theſe, great havoc was made by the Syracuſans in the Athenian fleet. Pott. Archæol. lib. iii. c. 7.

Beak was alſo uſed for one of the ancient battalia, or forms of ranging an army for battle, particularly uſed by the Macedonians.

Beak is alſo applied to the ſlender crooked prominences of divers bodies, bearing ſome analogy or reſemblance to the beaks of birds.

In this ſenſe we meet with beaks of ſhoes, *roſtra calceorum*, for long peaked toes, in uſe of old. Du-Cange.

Among *Farriers* beak denotes a little horſe-ſhoe, turned up, and faſtened in upon the forepart of the hoof.

It is uſed to keep the ſhoes faſt, and not liable to be ſtruck off by the horſe, when by reaſon of any itch, or being much diſturbed by the flies in hot weather, he ſtamps his feet violently on the ground.

BEAKED, *Becqué*, in *Heraldry*, is uſed when the beak or bill of a fowl is of a different tincture from the body.

In this caſe, they ſay *beaked* and membered of ſuch a tincture.

BEAKING, in *Cock-fighting*, expreſſes the fighting of theſe birds with their bills, or holding with the bill, and ſtriking with the heels.

BEAL, in *Geography*, a river of Ireland, which runs into the Shannon near Aikeaton, in the county of Limerick.

BEALE, Mary, in *Biography*, a female portrait painter in the reign of king Charles II., was the daughter of Mr. Cradock, miniſter of Walton upon Thames, and was born in Suffolk in 1632. Although ſhe was not inſtructed in the rudiments of painting by ſir Peter Lely, as ſome have ſuppoſed, ſhe diligently copied the works of that great maſter, as well as thoſe of Vandyke. She painted in oil, water-colours and crayons; and by copying ſome pictures of Italian maſters, improved her taſte and pencil, and acquired much of their air and ſtyle, which appear in her portraits. She was little inferior to any of her contemporaries with reſpect to colouring, ſtrength, force, or life; and ſhe worked with a great body of colours. Her performances were held in high eſtimation by ſir Peter Lely. Amiable in her conduct, and aſſiduous in her profeſſion, ſhe was very much encouraged and employed, both by the clergy and by ſeveral perſons of rank, whoſe portraits ſhe painted. It appears, that in one year ſhe received for pictures 429 l., and that ſhe and her huſband devoted about two ſhillings in the pound of their income to charitable purpoſes. In the MSS. of Mr. Oldys, Mrs. Beale is celebrated for her poetry as well as her painting. She died Dec. 28, 1697; and left two ſons, Charles and Bartholomew, both of whom exerciſed the art of painting; but the latter relinquiſhed painting, and ſtudied phyſic under Dr. Sydenham, and practiſed at Coventry, where he and his father died. Walpole's Anecdotes of Painting, vol. iii. Biog. Brit Pilkington.

BEALNABRUCH, in *Geography*, the name of a river in the county of Galway, province of Connaught, Ireland, which riſes in Joyces country near the Killeries, north of the mountain of Beannebeola or the twelve pins, and flows through a mountainous country into Lough Corrib, near the baſe of the ſtupendous Ben Levagh. The valley through which it runs is pretty well peopled. A great error is committed in Roque's and all the old maps, in repreſenting this river as flowing into Roundſtone bay, and affording a ſecond outlet to Lough Corrib, inſtead of carrying into it a large ſupply of water. Dr. Beaufort's Map and Memoirs.

BEALSBURG, a ſmall town of America, in Nelſon county, Kentucky, on the eaſt bank of Rolling fork, containing twenty houſes, and alſo a tobacco warehouſe; 15 miles W.S.W. from Bairdſtown, and 890 from Philadelphia. N. lat 37° 42′. W. long. 85° 50′.

BEALT. See Builth.

BEAM, in *Architecture*, is any piece of timber of a rectangular ſection of equal depth and thickneſs throughout its length, applied in an horizontal poſition in various ſituations in a building, for the purpoſe of reſiſting ſome ſtrain either in a longitudinal or tranſverſe direction, ſuch as to prevent the rafters of roofs from puſhing out adjacent walls upon which they reſt, or to ſuſtain a ſuperincumbent part of a wall inſtead of an arch. This word, however, is not much uſed technically, and only in combination with other words, which denote its poſition or uſe. When a beam is placed at the bottom of a pair of rafters it is called "a Tie-beam;" but if placed in a higher ſituation it is called "a Collar-beam." When a beam is placed over piers of maſonry or wooden poſts to ſupport a ſuperincumbent wall, it is called a "breaſt-ſummer," or "ſummer-beam." When a beam is placed acroſs a floor to ſupport the ends of joiſts and ſhorten their bearings, it is called a "girder," or "girding-beam." See Carpentry.

Some of the beſt authors have conſidered the force or ſtrength of beams, and brought their reſiſtance to a preciſe calculation; particularly M. Varignon and M. Parent. See Strength of Timber.

Beam *of a Plough*, in *Agriculture*, a name given by our farmers

farmers to the great timber of the plough, in which all the other parts of the plough-tail are fixed.

This is usually made of ash, and is straight, and eight feet long in the common plough: but in the four-coultered plough, it is ten feet long, and its upper part arched. The head of this beam lies on the pillow of the plough, and is raised higher, or sunk lower, as that pillow is elevated or depressed by being slipped along the crow-staves. Near the middle, it has an iron collar, which receives the tow-chain from the box, and the bridle-chain from the stake or gallows of the plough is fixed in it a little below the collar. Some inches below this, there is a hole, which lets through the coulter; and below that there are two other small ones, through which the heads of the retches pass. These are the irons which support the sheat, and with it the share. Farther backward still is a larger perforation, through which the body of the sheat passes; and behind that, very near the extremity, is another hole through which the piece called the hinder-sheat passes. See PLOUGH.

BEAMS of a ship, are the large, main, cross timbers, stretching from side to side, which hold the sides of a ship from falling together, and which also support the decks and orlops of the ship.

The main beam is that next the main mast; and from it they are reckoned by *first*, *second*, and *third beam*. The great beam of all is called the *midship-beam*.

There are usually twenty-four beams on the lower deck of a ship of 74 guns, and on the other decks additional ones in proportion, as the ship lengthens above.

BEAM, *on the*, in *Sea Language*, denotes any distance from the ship on a line with the beams, or at right angles with the keel. Any object that lies east or west, when the ship steers northward, is said to be on the starboard or larboard beam.

BEAM, *before the*, signifies an arch of the horizon comprehended between the line of the beam, and that point of the compass which she stems. See ABAFT.

BEAM, *on the Weather*, signifies on the weather side of the ship.

BEAM, *Camber*. See CAMBER-BEAM.

BEAM *of an Anchor*. See ANCHOR.

BEAM *of a balance*, is that piece of iron or wood, somewhat bigger towards the middle than at the ends, where there are holes through which run the ropes or strings which hold the scales: the beam is divided into two equal parts, by a needle placed over it perpendicularly: and the centre of motion must be placed a little above the centre of gravity, that the beam may rest exactly in an horizontal position. See BALANCE.

BEAM, or *Roller*, among *Weavers*, is a long and thick wooden cylinder placed lengthways on the back part of the loom of those who work with the shuttle. The threads of the warp, of linen or woollen cloth, serges, or other woollen stuffs, are rolled upon the beam, and unrolled as the work goes on. That cylinder on which the stuff is rolled as it is weaved is also called the beam or roller, and is placed on the fore part of the loom.

BEAM, in *Heraldry*, is used to express the main horn of a hart or buck.

BEAM, among *Hunters*, denotes the main stem of a deer's head; or that part which bears the antlers, royals, and tops; the little streaks of which are called circles.

BEAM is also used for a fiery meteor in the shape of a pillar; and for a ray of the sun.

BEAM *compasses*. See COMPASSES.

BEAM *feathers*, in *Falconry*, the longest feathers of a hawk's wing.

BEAM-*filling*, in *Building*, the filling up the vacant space between the rising plate and roof, with stones, or bricks, laid between the rafters on the raising plate, and plaistered on with loom; this is frequent where the garrets are not pargeted, or plaistered.

BEAM *tree*. See CRATÆGUS *Aria*.

BEAMINSTER. See BEMINSTER.

BEAN, in *Botany*. See VICIA *Faba*.

BEAN, *faba*. The medicinal and dietetic qualities of beans are said to be nutritive, but flatulent: the pods yield a water held good against the gripes in children. Some have used the horse bean as a succedaneum to coffee; which in principles it much resembles; only that it contains but half the quantity of oil. Mr. Boyle has several experiments of beans treated pneumatically to shew the great plenty of air they afford, on which their flatulency depends. This air, which beans contain in a fixed state, is extricated during their digestion in the stomach, in greater quantity than can be again absorbed, and upon that account these, and other legumina, have been at all times noted for occasioning flatulency, and sometimes colic pains. The expansion of beans in growing, Mr. Boyle also found so considerable that it would raise a plug clogged with above a hundred pounds weight. Boyle's Works abr. tom. i. p. 285. tom. ii. p. 615, &c.

Beans with proper management make one of the finest of all baits for fish. The method of preparing them for this purpose is this: take a new earthern pot glazed on the inside; boil some beans in it, suppose a quarter of a peck: they must be boiled in river water, and should be previously steeped in some warm water for six or seven hours. When they are about half boiled, put in three or four ounces of honey, and two or three grains of musk: let them boil a little on, then take them off the fire, and use them in this manner: seek out a clean place, where there are no weeds, that the fish may see and take the beans at the bottom of the water. Throw in some beans at five or six in the morning, and in the evening for some days. This will draw them together, and they may be taken in a casting net in great numbers.

The ancients made use of beans in gathering the votes of the people, and for the election of magistrates. A white bean signified absolution, and a black one condemnation. Beans had a mysterious use in the *lemuralia*, and *parentalia*; where the master of the family, after washing, was to throw a sort of *black beans* over his head, still repeating the words, "I redeem myself and family by these beans." Ovid gives a lively description of the whole ceremony in his Fasti, lib. v. ver. 435. Abstinence from beans is said to have been enjoined by Pythagoras, for which prohibition various reasons have been assigned. Some have supposed that it was intended to restrain his disciples from intermeddling in trials and verdicts which were decided by throwing beans into an urn. Others founding their opinion on the double sense of the word κυαμος, which signified both a bean and the common testicle, explain it by abstaining from venery. Clemens Alexandrinus grounds the abstinence from beans on their tendency to render women barren; which property is confirmed by Theophrastus, who extends the same effect even to plants. Cicero suggests another reason; viz. that beans are very injurious to mental tranquillity. Hence Amphiaraus is said to have forborne the use of beans, before Pythagoras, that he might be better prepared for divining by dreams. The Egyptian priests held it a crime to look at beans, judging the very sight unclean. The *flamen dialis* was not permitted even to mention the name. Lucian introduces the same philosopher in hell, saying, that to eat beans, and to eat our father's head, were equal crimes. After all, both the genuineness of the precept, and the reality of any such abstinence among the ancient

cient Pythagoreans have been disputed. Some attribute the precept to Empedocles, a disciple of Pythagoras. Aristoxenus, an ancient writer cited by A. Gellius, (l. iv. c. 11.) introduces Pythagoras saying, that he eat more frequently of beans than of any other pulse, on account of their gentle loosening the belly. Accordingly he is said to have permitted the use of them, because he believed them to be wholesome, but his disciples have forbidden them, because they thought them, as Hippocrates also did, productive of flatulency, and otherwise prejudicial to health. Thus, a prohibition, which was at first a civil regulation, or salutary advice, assumed the authority of a sacred law.

Bean, *Bog*. See Menyanthes.

Bean-*caper*. See Zygophyllum.

Bean-*cod*, in *Navigation*, a small fishing vessel or pilot boat, used by the Portuguese, which rigs with one mast, similar to the *Tartan*; which see.

Bean-*flour*, in *Antiquity*, called by the Romans *lomentum*, was of some repute among the ancient ladies as a cosmetic, wherewith to smooth the skin, and take away wrinkles.

Bean-*fly*, in *Natural History*, the name given by authors to a very beautiful fly, of a very beautiful purple colour, frequently found on *bean*-flowers. It is produced from the worm or maggot called by authors *nida*.

Bean, in *Agriculture*, a sort of pulse, of which there are several kinds: but those best adapted to field culture are the small sorts, such as the common *horse-bean*, and the *tick-bean*. The large sorts, or garden-beans, as the *Windsor*, *Long-pod*, and *Mazagon*, have also been occasionally employed in the field, with success, in some of the southern districts.

Beans constantly prefer a strong moist soil, and on such, where proper culture is given, they mostly afford an abundant produce. Tick-beans are supposed by some farmers to be more productive than horse beans; but the latter grow higher in the stem, and produce a more stagnated state of the air, or smother the land more, consequently are the most suitable for the stronger sorts of soil.

The author of the Agricultural Survey of Middlesex observes, that beans are a crop which thrive well in almost any soil that is rather strong, such as medium-loams, sandy-loams, clayey-loams, and chalky-loams; on clay, marl, chalk, and such like cool subsoils. And the author of the Synopsis of Husbandry remarks that the proper time for planting beans is towards the latter end of January, or early in the following month; though this business may be continued to advantage till the middle or latter end of March, if the weather had prevented their being got in at an earlier season; but in general it is best to embrace the first opportunity of sowing them after Candlemas, as they often miscarry if the season be procrastinated beyond that time, especially if a dry summer should succeed. In purchasing beans for seed, care should be taken to choose such as are hard and bright, without being shrivelled in their appearance.

Mr. Donaldson, in his view of the present state of husbandry, observes, that the ordinary mode of preparing land for a crop of beans, is to give one ploughing only, which is generally performed in the spring, immediately before the seed is sown.

Beans are for the most part sown broad-cast, either on the stubble, before ploughing, or on the new turned-up furrows. Sometimes beans are sown or planted in the bottom of every second or third furrow, and afterwards horse and hand-hoed. In a few districts they are sown with a drill-machine, and at such distances in the rows as to leave sufficient space, either for hand-hoeing, when that only is intended, or for horse and hand-hoeing, when it is purposed that both these operations should be performed. It will at once appear obvious, he thinks, that either of these last-mentioned methods is preferable to sowing the seeds broad-cast, as a better opportunity is not only afforded of cleaning the ground properly, but a more abundant return, and a produce of superior quality insured.

The spring seed time in general commences with the sowing of beans. In the southern districts, they are sown in ordinary seasons so early as the middle or towards the end of February; and in the northern parts of Scotland so late as the beginning of April. The month of March may, however, as has been observed, be considered as the general bean seed season.

The first of the above writers thinks, that on land which is inclined to moisture the preparation for this crop should be as follows: Early in autumn lay on the manure, and immediately plough the land into ridglets of two feet six inches wide; in which state let it lie until the season for planting, when the seed may be dibbled in, one row of beans into the middle of each ridglet, at the distance of about three inches from bean to bean. They should be immediately covered; which may be done by children, with a garden rake or hoe, or, should the surface of the land be dry and crumbly, a horse and a bush harrow would do as well. In most places, he observes, it is adviseable to set a boy with a rattle to frighten away the rooks until the beans have attained some growth. The distance between the rows will not prevent the crop from completely covering the ground, especially if the land was manured for them, as they will branch out sideways, three or four stout stems from each root. They should be early planted, in order to their getting sufficient root-hold of the land, and procuring shade against the hot weather sets in. It is also some security against the *black dolphin*, which is the greatest enemy the bean is ever attacked by. They require a soil that can seldom be worked without damage during the winter and spring; consequently it ought to be manured and gathered into one bout ridges in the autumn. The shape of these ridges keeps the land more dry through the winter than any other, and prevents excessive rains from washing away the manure, which had been previously folded by the plough into the centre of such ridges; in which state it should lie, as has been already observed, until the season for sowing; when the land thus prepared will be so dry as to admit of dibbling every fair day; which secures to the farmer the advantage of choosing his season. He dunged, he says, about ten acres in September 1793, and ploughed the land into ridges of two feet and a half wide, burying the dung in the middle of them. The land lay dry through the winter, and he dibbled one row of beans into the middle of each ridge during the first week of February 1794. My neighbours, says he, on a similar soil, who ploughed into flat ridges of about fifteen feet wide, could not get their seed in till March. The ensuing summer was uncommonly dry: my beans being so unusually wide apart, admitted the plough and hoe to work as freely between the rows as a stubborn soil would allow. The plants tillered or branched till they completely covered the intervals, and the field appeared as completely cropped as though it had been sown broad-cast. When my neighbours' plants, says he, were beginning to pod, mine were half set. The whole were alike attacked by the black-fly, which reduced their crops to a bushel or two per acre, while I had twenty.

Mr. Young, however, remarks in the Survey of Suffolk, that it is there uncommon to give more than one earth for beans, and generally improper, as they love a whole firm furrow, and never thrive better than on a layer.

There are many different methods, Mr. Bannister says, of raising crops of beans. In some counties they sow this pulse by broad-cast, which is by no means an eligible way, since much

much of the ſeed will be left above ground, and a great part of that which is covered by the harrow will not be covered to a proper depth; and many other objections might, he thinks, be urged againſt this method of ſowing beans at random, of which it is not one of the leaſt, that ſuch irregular ſown crops are in great danger of being injured by weeds, which cannot ſo eaſily be extricated when the beans are ſown at random as when they are planted regularly in drills.

In ſome diſtricts, as Middleſex, Surrey, &c. the method is, to plant this pulſe in rows ſtricken out by a line, by which a great ſaving is made in the article of ſeed, a circumſtance which is thought to compenſate for the extraordinary charge of this mode of huſbandry; and thus far it may be fairly acknowledged, that the method of planting beans by the dibble is greatly to be preferred to that of ſowing the ſeed at random. The economy of this agricultural proceſs he thus explains: the rows are marked out one foot aſunder, and the ſeed planted in holes made two inches apart; the lines are ſtretched acroſs the lands, which are formed about ſix feet over, ſo that when one row is planted, the ſticks to which the line is faſtened are moved by a regular meaſurement to the diſtance required, and the ſame method purſued till the field is completed. The uſual price for this work is 9d. per peck, and the allowance two buſhels per acre. Great confidence muſt neceſſarily be repoſed in the people who tranſact the buſineſs of planting beans by the dibble, who, if inclined to fraud, have it in their power to deceive their employer by throwing great part of the ſeed into the hedge, from which their daily profits are conſiderably enhanced, their own labour ſpared, and every diſcovery effectually precluded, till the appearance of the crop, when the frequent chaſms in the rows will give ſufficient indications of the fraud; and by this time perhaps the villainous authors of the miſchief may have eſcaped all poſſibility of detection, by having conveyed themſelves from the ſcene of their iniquity. Such is the method of planting beans by the dibbler; but the neateſt and moſt expeditious way of ſowing this pulſe, eſpecially the field bean, is, he obſerves, that purſued by the Kentiſh farmers. The uſual courſe in that county, is to plough up the oat or barley grattens, which are deſigned for beans, ſoon after the wheat ſeaſon is finiſhed, in which condition the fallows are to lie till towards Candlemas, or later, as the ſtate of the weather, or the farmer's occaſion may require, and then to ſtrike out the furrows.

About eleven furrows to a row's breadth is the uſual width of ſetting out the rows, though ſome prefer a wider ſpace, whilſt others ſtrike them ſtill narrower; and this difference in the width of the rows is the cauſe why the farmers vary ſo eſſentially in reſpect to the quantity of ſeed to be ſown on the ſame given ſpace of ground; for, whilſt ſome will content themſelves with an allowance of two buſhels per acre, others will throw a ſack of beans upon the ſame compaſs of land. When the furrows are ſtruck at the diſtance mentioned before, two buſhels and a half of middle-ſized tick-beans are ſufficient to ſeed an acre, and on good land (for if the ground be not either rich in itſelf, or rendered fertile by art, it is of little conſequence to attempt the cultivation of this crop,) a perſon, in his opinion, ſtands a much fairer chance for a crop when the beans are thinly planted, than when a more liberal quantity of ſeed is allowed; for, when beans ſtand ſo very thick in the rows, they never pod ſo kindly as when the ſtalks are leſs crowded; and although the crop of haulm may be more abundant, the increaſe will not be adequate to the large bulk of ſtraw.

In Suffolk, according to Mr. Young, beans have been dibbled by ſome a row on every ſlag; by others, on every other ſlag. He has found it more advantageous to plant in cluſters four or five beans in every hole; and eight or nine inches from hole to hole, which admits of much better hoeing than when more thickly ſet. Dibbling, ſays he, is the beſt and moſt effective method of cultivating beans. In the Synopſis of Huſbandry it is further obſerved, that in Kent ſome people make uſe of a drill plough at bean ſeed time; but as this pulſe, eſpecially the larger ticks, are very unequal in ſize, they cannot be let out of the hopper with ſufficient regularity; for by this inequality in ſize, many yards of ground in the length of a furrow will be left vacant from the caſual obſtruction of a large bean, and when this is removed, numbers of a ſmaller ſize crowd to the chaſm, and ſhoot out of the hopper for a conſiderable ſpace, till another large bean intervenes to obſtruct the paſſage, and thus the crop makes a very unſightly appearance in the rows, and at the time of harveſt is very unequal; the injury in large fields being not inconſiderable: for, in thoſe parts of the furrows, where no beans had been ſown, an increaſe cannot be expected; and thoſe which are huddled together by a quart or more in a ſpot, will, from the thickneſs of their growth, in courſe come to little. Some farmers are ſo nice as to pick and cull their ſeed before it goes into the hopper, in order to render the beans more even, and prevent the injury above mentioned: but this is a very tedious practice, and after all, he believes, very ſeldom anſwers the expence. The beſt method of ſowing this crop, according to this writer, is from an inſtrument called a box, which is held by a man who follows the ſtriking plough, and who, by ſhaking the box filled with beans, drops them with regularity in the furrow, keeping even pace with it; ſo that by two men, and two or three horſes to the ſtriking plough, a man to box, and a boy and two horſes to harrow down the ground after the plough, three acres may be finiſhed off in a day, and the whole conducted with regularity.

The writer of the Agricultural Survey of Middleſex thinks that beans ſhould be manured for, and kept perfectly clean while growing, by ploughing, horſe or hand-hoeing, and hand-weeding; and that where they are ſo managed, they are an excellent preparation for either wheat or oats. They have a tap root, and hence they are more likely to ſucceed after crops that have fibrous roots; though he never heard that they would not grow after any crop. They are generally ſown after wheat, barley, or oats; and ought, as has been already obſerved, to be planted on ridglets, eſpecially on wet and thin-ſkinned ſoils.

In the Synopſis of Huſbandry it is recommended as a good method to roll and harrow beans in the latter end of March. By the roll, ſays this writer, the clods are broken ſo as to afford freſh nouriſhment to the roots; and the harrows following this operation pulverize and looſen the ſurface, which had been flattened and baked down by the rains in the preceding month, by which the beans are conſiderably aſſiſted in the future progreſs of their growth. Soon after this the crop ſhould be edge-hoed, and afterwards braked; which method of braking is a piece of huſbandry peculiar to the county of Kent, and in every reſpect claims the preference to that of hoeing the whole ſpace between the rows; not only becauſe the braking is performed at an inferior expence, but it is likewiſe more efficacious, as well for extirpating the weeds that may have ſprung up between the rows, as in furthering the advances of the beans in growth, by looſening the ſoil, and conveying freſh earth to the ſtalks. This operation of braking may be continued at the interval of three weeks or a month, from the beginning of May till the crop becomes in bloom. When it is propoſed to earth up the beans, this may be effected with great facility by fixing a ſmall block of wood on the *ſtrig* of the brake; the manner of doing which is familiar to every Kentiſh ploughman; and according to the diameter of this block, the earth may be

thrown

thrown to different heights on the bean ſtalks, as they advance in growth.

In dry ſummers when eaſterly winds prevail, beans are very apt to be ſtricken with the *dolphin* fly, an inſect which in a very ſhort ſpace of time will deſtroy the produce of a whole field. In this caſe it has been found very beneficial to take off the tops with a ſcythe, as the dolphin generally effects its firſt lodgment in the upper part of the ſtalk. Where this pulſe is ſown broad-caſt, there remains no other way of cleanſing the field, than by cutting up the weeds with a hook, or by turning in a flock of ſheep in May, where the ground is very foul, as this animal will devour the weeds, and leave the beans untouched. From this very partial method of weeding, it may fairly be concluded little benefit can accrue, and that the gratten will be abundantly ſtocked with weeds at harveſt, and the ground be totally unfit for ſowing with wheat: and, indeed, the practice of ſowing bean grattens with wheat is never attempted in thoſe countries where this method of ſowing beans at random prevails; and here, therefore, the bean and pea grattens generally come in courſe the next year for a fallow. This is a practice that cannot be recommended.

It is remarked in the Survey of Middleſex, that beans are ſeldom ripe enough to cut till the latter end of Auguſt, and the proper time is when the *kids* are turning black, about ten days before they would begin to open at the ends. Though in ſome parts of the field the kids may not be ſo black as in others, this ſhould not prevent their being cut; for they will ripen and harden after that is done, by ſetting the ſheaves upright, and leaving them in the field for a week or ten days. If they are cut long before they are ripe, they will ſhrink and ſhrivel; and if too ripe, they will ſhed conſiderably; though there is much leſs danger in reaping them too early, than in letting them ſtand too long. Thoſe that are over-ripe ſhould be cut with the dew on them, and carried to the barn in the ſame ſtate; the green parts of the crop being cut in the middle of the day. When the intention is to ſow wheat or tares after beans, they ought to be ſet up ſo as to occupy as little ſpace as poſſible, that the vacant ground may be immediately prepared for the next crop. The writer of the Synopſis of Huſbandry aſſerts, that after a growing ſummer, and on land which is in good heart, there will be many green pods when the crop is upon the whole fit for the hook; for the ſtalks having run to a great length, and being very replete with moiſture, the upper part of the leaves, pods, and ſtalks, will appear to be in a growing ſtate long after the pods on the lower part of the ſtalk are fully ripened. To wait the ripening of theſe upper pods would be very ill-judged, as by this delay great part of the crop would be loſt, from the ſhedding of thoſe which were already come to maturity. The beſt method, therefore, is to cut the beans when the major part have ripened, and by ſuffering the ſhocks to remain ſome time in the field, the upper part of the ſtalks will be ſufficiently withered, ſo as to prevent any ill effects from their humidity, when laid in the barn or ſtack; nor will the beans from thoſe unripened pods be of any injury to the ſample. At harveſt time, the ſame author informs us, that in Kent thoſe beans which were ſown broad-caſt are mown with a ſcythe, and carried looſe into the barn; a practice which is fraught with many inconveniences; but that in Middleſex, where the beans are planted in rows with a dibbler, as before mentioned, the intervals are carefully cleanſed during their growth by means of a hoe; and to this purpoſe the farmers are under the neceſſity of employing a number of hands; the Kentiſh method of cleaning the intervals by the brake not having yet been introduced into that county; ſince the whole ground between the rows muſt be flat-hoed. At harveſt, the ſtalks are cut with a hook, bound into ſheaves, and ſet up four together; and as a ſubſtitute for ſtrings, it is uſual to ſow the headlands with peaſe, the haulm of which anſwers the purpoſe of bands to tie up the ſheaves. The Kentiſh mode of huſbandry is greatly to be preferred, he thinks, to that of the Middleſex farmers, as is evident from the conſideration of the comparative diſadvantages which attend a crop raiſed and managed according to the latter method, with the ſuperior benefits of the former. At ſeed-time the planting by a dibbler is infinitely more tedious and expenſive than that of dropping the ſeed into the furrow after the ſtriking plough; and in the courſe of huſbandry required to cleanſe the intervals, the ſeveral flat-hoeings cauſe a far heavier charge than what attends the braking and edge-hoeing; and after all, the ground is not ſo well prepared for a wheat ſeaſon at Michaelmas, a method of huſbandry generally purſued by the Middleſex farmers. One reaſon may be aſſigned, he ſays, why the Kentiſh huſbandry has not yet been adopted by the Middleſex farmers; and this is from the nature of the land in that county, which in many parts is a deep heavy clay, ſo that on theſe adheſive ſoils the *ſwing-plough* is generally uſed, and the ground divided into partitions, or (as they are termed) lands, to guard againſt the contingency of a wet ſeaſon. But ſurely, ſays he, this ſoil might be worked with a turn-reſt-foot plough, and by proper drains be ſecured from the ill effects of a moiſt time; and the field being thus laid on a level, the rows might eaſily be ſtruck out, and the ſubſequent brakings be executed to advantage during the ſummer, as uſual with the Kentiſh farmers. It is added, that in thoſe parts of Kent where the round tilth huſbandry is purſued, the farmers are particularly attentive to the ſeveral operations of hoeing and braking the ground during the growth of the beans; for, as the land in that county is of a nature ſo fertile as not to require the intervention of a ſummer fallow, they ſpare no pains in the cultivation of their bean and pea grounds, in order to render it as clean and well pulverized as poſſible by means of the hoe and brake, ſo that this latter inſtrument is ſcarcely ever out of the field, from the beginning of May till the time when the beans are advanced to that height, as to obſtruct the working of it; by which the ground becomes ſo intimately divided, that every particle of ſoil in the interſpace is expoſed to the beneficial influence of the ſun and air, and at harveſt ſcarcely a weed is perceptible throughout the crop. In order to deſtroy what few weeds may remain in the rows, and to give that part of the ground its due ſhare of pulverization, and to cleanſe it from the bean haulm, a plough is ſet to work ſoon after harveſt to ſpuddle the gratten: and for this purpoſe a plate of iron is fixed acroſs the ſhare at about four or five inches from the point, and the ſame axle-tree and wheels are made uſe of that were before employed for ſtriking out the furrows; and with this plough and two horſes three acres of ground may be ſpuddled in a day, by ſetting the ſhare point in the interval, ſo that the iron or ſin may embrace a row on each ſide; and when the whole field is thus ſpuddled, the harrows and roller are to ſucceed, by which the haulm and weeds will be completely extricated at a trifling charge, and the ground be laid in readineſs for ploughing the ſeed furrows, at which time thoſe beans or peaſe which may have been ſhed will have vegetated, and are deſtroyed by the plough; ſo that the farmer may, from this mode of huſbandry, be not leſs confident of growing a clean ſample of wheat, than if his ground had been ſummer fallowed.

On thin, chalky, or gravelly grounds, notwithſtanding what has juſt been urged of the good effects of ſpuddling, he obſerves

obſerves that it would perhaps be more prudent to omit that work, leſt it might contribute towards looſening the ſoil beyond a due medium; for on theſe ſoils the chief aim ſhould be to cloſe them as much as poſſible, that at wheat ſeed-time the ſurface may be perfectly tight; and therefore to roll and harrow the bean and pea ground on ſuch ſoils, in order to rid the field of the haulm, &c. and when it has lain ſome time, to plough the ſeed furrows, are the whole proceſs neceſſary to prepare it for the ſucceeding crop of wheat: and this ſhows, he thinks, the neceſſity of ſowing with this grain or with peaſe that part of the farm which is moſt free from weeds, and in the beſt heart; not only that theſe pulſe, both of them (eſpecially beans) require to be ſown on good land, and on ſuch as has been improved by art, but likewiſe that the grattens may be ſo perfectly clean, as not to require the operation of ſpuddling. In Kent, they cut their beans with a hook, and bind them into ſheaves with rope-yarns. Theſe ſheaves are ſet up in ſhocks of various forms, either five on each ſide, in the manner of wheat ſhocks, or in a circular form, four ſheaves to the ſhock. The expence of cutting, binding, and ſetting up is from 4s. to 6s. or 7s. per acre, according to the degree of goodneſs in the crop. Some farmers, in ſuch years when the hops have failed, cut up the bind, and reſerve it as a ſubſtitute for rope yarns to tie up their bean ſheaves. But though this practice may at firſt ſight bear the appearance of frugality, it will be found eventually to be the moſt expenſive: as the cutting the hop-vines at that ſeaſon will be apt to cauſe them to bleed, to the infinite prejudice of the ſtocks; and thus the future crops may be hazarded by a premature removal of the binding thoſe years when, from the failure of the hops, it ſhould ſeem to be of no further uſe. Mr. Marſhall, however, recommends the pulling beans in preference to cutting; for, he ſays, the benefit the ſoil receives will more than pay for the extra labour in clearing. Another advantage ariſing from their being pulled, is the ſtubbornneſs of the roots keeping the mow open, and admitting a circulation of air. And he ſays in another place, that by experience he found pulling up by hand far preferable to cutting with ſickles; as they may be pulled up not only much faſter, but much cleaner from weeds and graſs than when cut, beſides leaving the land in a ſtate greatly ſuperior. The waſte is alſo leſs, ſo much ſo as to loſe ſcarcely a bean; and the bean ſtalks are immediately ready to bind and ſet up; and by the roots lifting them from the ground, the air acquires a free circulation. The work is alſo eaſier to the labourer, who ſtands more upright, and the power required is much leſs, eſpecially in dry weather. By ſtriking the roots of each handful againſt the foot, the mould is almoſt wholly diſengaged from the fibres. The ſoil in the drills, inſtead of being bound by the roots, and encumbered by the ſtubble, is left as looſe as a garden, and the ſurface free from obſtructions; and if thoroughly hoed, is as fit as a fallow to be ſowed with wheat on one ploughing.

Beans are every where an uncertain crop, conſequently the average produce difficult to eſtimate. In Kent, Mr. Young thinks, they probably exceed four quarters; but in Suffolk he ſhould not eſtimate them at more than three: yet five or ſix are not uncommon. According to Mr. Donaldſon, a crop of beans, taking the iſland at large, may be ſuppoſed to vary from ſixteen to forty buſhels; but that a good average crop cannot be reckoned to exceed twenty. And in Middleſex, Mr. Middleton tells us, that bean crops vary from ten to eighty buſhels per acre. They are rendered a very precarious crop by the ravages of myriads of ſmall black inſects of the ſame ſpecies. The *lady-birds* are ſuppoſed either to generate or feed on them, as they are obſerved to be much among them. Mr. Foot ſays, the average produce is from three and a half to four quarters per acre.

It is aſſerted, by the author of the Synopſis of Huſbandry, that bean ſtraw, if well harveſted, forms a very hearty and nutritious diet for cattle in the winter-time; and that both oxen and horſes, when not worked, will thrive on it. Sheep are alſo very fond of browſing on the pods; and the *cavings* are very nutritious manger meat for horſes. But in Middleſex the ſtraw is generally employed in bedding the farmer's horſes and other cattle, and in littering the farm yards, where it is picked over by young ſtock; though ſometimes a load is ſold for 20s. or 25s. delivered in. When the bean-ſtraw and the *caving-chaff* are made uſe of as a fodder for cattle, they ſhould always be newly threſhed, as in that ſtate they are much more nutritious than when they have been kept ſome length of time.

Crops of this kind are for the moſt part applied to the purpoſe of feeding horſes, hogs, and other domeſtic animals. In the county of Middleſex all are given to horſes, except what are preſerved for ſeed, and ſuch as are podded while green, and ſent to the London markets. When pigs are fed with beans, it is obſerved that the meat becomes ſo hard as to make very ordinary pork, but good bacon. It is alſo ſuppoſed that the mealmen grind many horſe-beans among wheat, to be manufactured into bread. And Dr. Darwin remarks in his Phytologia, that a ſtrike or buſhel of oats weighs perhaps forty pounds, and a ſtrike or buſhel of peas and beans ſixty pounds; and that as the ſkin of peas and beans is much leſs in quantity than that of oats, he ſuppoſes there may be at leaſt fifteen pounds of flour more in a ſtrike of peas and beans than in a ſtrike of oats. There is alſo reaſon to believe, he ſays, that the flour of beans is more nutritive than that of oats, as appears in the fattening of hogs; whence, according to the reſpective prices of theſe two articles, he ſuſpects that peas and beans generally ſupply a cheaper provender for horſes than oats, as well as for other domeſtic animals. But as the flour of peas and beans is more oily, he believes, than that of oats, it may in general be ſomewhat more difficult of digeſtion; hence, when a horſe has taken a ſtomach full of peas and beans alone, he will be leſs active for an hour or two, as his ſtrength will be more employed in the digeſtion of them, than when he has taken a ſtomach full of oats. Hence it may be found adviſable to mix the bran of wheat with the peas and beans, a food of leſs nutriment but of eaſier digeſtion; or to let the horſes eat before or after them the coarſe tuſſocks of four graſs, which remain in moiſt paſtures in the winter; or laſtly, to mix finely cut ſtraw with them.

BEAN, in *Gardening*. See VICIA.

BEAN-*Gooſe*. See ANAS.

BEAN, *Ignatius's*. See IGNATIUS'*s Bean*.

BEAN, *Kidney*, or *French*, in *Botany*. See PHASEOLUS.

BEAN, *Kidney*, *Tree*. See GLYCINE.

BEAN, *Malacca*, the *anacardium orientale*, is a fruit of a ſhining black colour, of the ſhape of a heart flattened, with a very thick pedicle occupying almoſt the whole baſis. For the characters of the plant that produces it, ſee AVICENNIA *Tomentoſa*; and for its qualities, ſee ANACARDIUM.

BEAN, *Molucca*, a name given by ſir Robert Sibbald in his *Prodromus*, and by Mr. Wallace in his deſcription of the Orkney iſlands to a ſort of fruit frequently caſt on ſhore in the north-weſt iſlands of Scotland, eſpecially on the coaſts moſt expoſed to the waves of the great ocean. They are called by ſome Orkney beans, and are not the produce of that iſland, or indeed of any other part of Europe, but of America. Sir Hans Sloane procured four ſpecies of them little

little injured by the ſea, and found on examination that three of them were the common produce of the iſland of Jamaica; where he had himſelf gathered them, and deſcribed them in his catalogue and hiſtory.

The firſt ſort was a kind of kidney bean, and the plant which produces it is deſcribed by ſir Hans under the name of the great perennial kidney bean, with a great crooked lobe. It is alſo figured in the Hortus Malabaricus by the name of *perim kalavali*, and ſir Robert Sibbald alſo calls it *nux Indica ex qua pyxides pro pulvere ſternutario parant*. This is a native of the Eaſt and Weſt Indies, and is ſometimes found thrown on ſhore in the county of Kerry in Ireland, and in ſome other places. A ſecond kind of fruit thrown on ſhore in the Orkneys, is a very common fruit in Jamaica, known there by the name of the horſe-eye bean; it has this name from its reſembling the eye of ſome large animal, by reaſon of a *kilus* or welt which ſurrounds it. This is deſcribed by many authors, and among the reſt by ſir Hans Sloane, in his catalogue of Jamaica plants; and is found in many other of the hotter parts, both of the Eaſt and Weſt Indies. A third kind of fruit found on theſe ſhores, is that called by the people of Jamaica the aſh-coloured nickar nut; it has this name from its colour, and from its being perfectly round, of the ſhape of a nickar, or marble, ſuch as boys play with. This is alſo common in the Eaſt and Weſt Indies. A fourth kind is alſo a Jamaica fruit, with the hiſtory of which we are not yet well acquainted; nobody has ſeen it growing, but the fruit itſelf is preſerved in many of the collections of the curious, and has been figured and deſcribed by Cluſius and others under the name of a round exotic fruit rigid with four riſing nerves.

Theſe are the principal kinds of fruits thus toſſed on ſhore with us; but how the products of Jamaica, or other parts of America, ſhould be brought to the ſhores of Scotland and Ireland, ſeems difficult to determine on any certain foundation. It is eaſy to conceive, that when they grow by the ſides of rivers, they may fall off from the trees into them, and be thence conveyed into the ſea. It is likewiſe eaſy to ſee, that when they are thus floating on the ſurface of the ſea, they may be carried about by the winds and currents to a conſiderable diſtance; but their motion this way muſt naturally be ſtopped by the main continent of America, and they muſt be forced through the gulf of Florida, or the canal of Bahama, going thence conſtantly eaſt, and into the North American ſea. This is eaſily conceived by a ſimilar fact which happens every day; which is, that a kind of ſea lentil, called *ſargaſſo*, which grows very plentifully on the rocks about Jamaica, is waſhed off from thence, and carried by the winds and currents, which for the moſt part go impetuouſly the ſame way, toward the coaſt of Florida, and thence into the North American ocean, and is there found floating on the ſurface. Thus far it is eaſy to trace our fruits from their native ſoil: but how after this they ſhould be forwarded to us is unaccountable, unleſs we ſuppoſe, that as ſhips when they go ſouth expect a trade eaſterly wind, and when they come north expect and generally find a weſterly wind, for at leaſt two parts in three of the year; ſo theſe fruits being brought north by the current from the gulf of Florida, are put into the way of theſe weſterly winds, and by them conveyed to the coaſts of Scotland and Ireland. Philoſoph. Tranſact. N° 222. p. 300.

By the ſame means that theſe beans came to Scotland, it is reaſonable to believe that the ſame winds and currents brought from America thoſe ſeveral things towards the Azores and Porto Santo, which are recorded by Ferdinand Columbus in the life of his father; which gave this bold adventurer the firſt notion that there was ſuch a place as America. Among the things he mentions as waſhed aſhore in this manner, was a piece of wood very ingeniouſly wrought, but evidently without the help of iron tools. This was taken up by a Portugueſe pilot, four hundred and fifty leagues from ſhore, off cape St. Vincent, after a weſt wind which had blown violently for many days: after this ſuch another piece of wood was taken up on the ſhore of Porto Santo, after ſuch another long and violent weſt wind. Large canes, vaſtly ſuperior to any of the growth of the then known parts of the world, were alſo found thrown on the ſame ſhores, and the fruits of pines which did not grow in any known part of the world; and finally the bodies of two men appearing to be of a different nation from any of the known people, and two of the canoes, were driven on ſhore on the iſland Flores, one of the Azores. All theſe things having been found only after ſtrong and continued weſt winds, it appeared very evident, that there muſt be land ſomewhere to the weſt, where fruits and men were to be found; and that theſe men had no knowledge of our arts, by their want of iron. From theſe conjectural concluſions ſprung the greateſt diſcovery of modern times.

Bean *Stalks*. The aſhes of bean ſtalks make good and clear glaſs.

Bean *Tree*, *Erythrina*. See Corallodendron.

Bean *Tree*, *binding*. See Mimosa.

Bean *Trefoil*. See Anagyris, and Cytisus.

Bean is alſo uſed by ſome *Anatomiſts* to denote the *glans of the penis*, on account of its figure and reſemblance to that pulſe.

Bean is alſo improperly uſed for a weight, containing the third part of a ſcruple.

BEANA, in *Ancient Geography*, a town of Aſia, placed by Ptolemy in Babylonia.

BEAR, in *Aſtronomy*, a name given to two conſtellations called *the Greater* and the *Leſſer Bear*, or *Urſa major* and *minor*.

The pole ſtar is ſaid to be in the tail of the *Leſſer Bear*; this ſtar is never above two degrees diſtant from the north pole of the world. See Ursa.

Bear, or Bere, in *Agriculture*, is a ſpecies of barley cultivated in Scotland and Ireland, and the northern parts of England. It yields a large return, but is not eſteemed ſo good for malting as the common barley.

Bear, in *Zoology*. See Ursus.

Bear, *Ant*. See Tapir, and Ant-eater.

Bear, *Polar*. See Polar *Bear* and Ursus.

Bear, *Sand*, is ſuppoſed to be a variety of the badger, or Ursus *Meles*, and the ſame animal which naturaliſts have deſcribed under the name of the "ſow-badger." Its colour is a yellowiſh white; its eyes are ſmall, and its head thicker than that of the common badger; its legs are ſhort, and on each foot are four toes, armed with ſharp white claws. It is almoſt without hair, very ſenſible of cold, and burrows in the ground.

Bear, *Sea*. See Sea-*Bear*.

Bear's *Fleſh*, was much eſteemed by the ancients: even at this day the paw of a bear ſalted and ſmoaked is ſerved up at the tables of princes.

Bear's fleſh is reckoned one of the greateſt rarities among the Chineſe; inſomuch that, as Du-Halde informs us, the emperor will ſend fifty or a hundred leagues into Tartary, to procure them for a great entertainment. The fleſh is reckoned ſuch a dainty among the inhabitants of Kamtſhatka, that they ſeldom eat it alone, but uſually invite a number of gueſts to partake of the delicious repaſt. The inteſtines alſo, when cleanſed and properly ſcraped, are worn by the fair-ſex as maſks to guard their faces from the ſun-beams,

which being reflected from the ſnow, are generally found to blacken the ſkin; by which means the Kamtſhadale ladies preſerve a fine complexion. The Ruſſians of Kamtſhatka make window-panes of theſe inteſtines, which are as clear and tranſparent as thoſe made of Muſcovy glaſs. Of the ſhoulder blades of the bear are made ſickles for cutting graſs; and the heads and the haunches are hung up by the Kamtſhadales, as ornaments or trophies, on the trees about their dwellings.

Bear's *Greaſe*, is eſteemed by ſome a ſovereign remedy againſt cold diſorders, eſpecially rheumatiſms. Some have alſo employed it with ſucceſs in the gout, and againſt tumors and ulcers. To be good, it muſt be newly melted, greyiſh, glutinous, of a ſtrong diſagreeable ſmell, and a moderate conſiſtence. That which is too white is adulterated with common tallow. It is now much uſed by hair-dreſſers, and is ſaid to be of ſervice in thickening the hair, and for other purpoſes.

The inhabitants of Kamtſhatka hold in high eſtimation the fat of the bear, as a very ſavoury and wholeſome nouriſhment; and when melted and thus rendered fluid, it ſupplies the uſe of oil.

Bear's *Skin*, makes a fur in great eſteem, and on which depends a conſiderable article of commerce, being uſed in houſings, on coach-boxes, &c. In ſome countries, cloaths are made of it, more eſpecially bags wherein to keep the feet warm in ſevere colds. Of the ſkins of bears' cubs are made gloves, muffs, and the like. It is uſed in Ruſſia for beds, covertures, caps, gloves, and collars for their ſledge-dogs. Thoſe who traverſe the ice for the capture of marine animals make their ſhoe-ſoles of bears' ſkin, which prevents the danger of ſlipping. A light black bear ſkin is one of the moſt comfortable and coſtly articles of the winter wardrobe of a man of faſhion at Peterſburgh or Moſcow; and even the ſmall white hand of a belle is ſlipt into the large bear muff, which covers the half of her elegant ſhape. The exportation of bear-ſkins forms a very conſiderable article of Ruſſian commerce, independently of thoſe that are uſed for home conſumption.

Bear *Garden*, a place where bears and other beaſts are expoſed as a public ſpectacle to be baited. See Baiting.

Bear, *hunting and killing of the*. The bear is in a variety of reſpects ſo uſeful an animal in Ruſſia and northern countries, that the inhabitants have deviſed ſeveral ingenious methods of taking and deſtroying them. The moſt uſual way of killing this animal is with fire arms, and ſpears or darts. The Laplanders knock them down with clubs, as they can eaſily overtake them in running with their ſnow-ſhoes; but they are generally firſt ſhot, and then diſpatched with ſpears. In ſome parts of Siberia, the hunters erect a ſcaffold of ſeveral balks laid on one another, which falling down, cruſhes the bear, on his ſlipping upon the trap placed under it. Another method is to dig pits, in which is fixed a ſmooth, ſolid, and very ſharp-pointed poſt, which riſes about a foot above the bottom. The pit is carefully covered with ſods, and acroſs the track of the bear is ſtretched a thin rope with an elaſtic bug-bear. As ſoon as the bear touches the rope, the wooden bug-bear ſtarts looſe; and the ſcared animal, endeavouring to ſave himſelf by flight, falls with violence into the pit, and is killed by the pointed poſt. If he eſcape this ſnare, at a ſmall diſtance, perhaps, ſeveral caltrops (ſee Caltrop) and other inſtruments of annoyance await him, amongſt which a ſimilar terrific log is erected, and where the perſecuted beaſt, the more he ſtrives to get free, fixes himſelf more firmly to the ſpot at which the blood-thirſty hunter lies in ambuſh for him. The Koriaks find out a crooked tree, which is grown up in the form of a gibbet, and at the bent ſummit of it they attach a nooſe, with a bait ſuſpended to it. The hungry bear, thus allured, eagerly climbs up the tree, and on his moving the branch, the nooſe draws together, and the animal remains ſuſpended to the tree. But the method adopted by the inhabitants of the mountainous parts of Siberia to make this ferocious animal kill himſelf is more ſingular and ingenious. They faſten a very heavy block to a rope, terminating at the other end with a loop. This is laid near a ſteep precipice on the path which the bear uſually takes. On having his neck in the nooſe, and finding that he cannot proceed on account of the clog, he takes it up in a rage, and to free himſelf from it, throws it down the precipice, which of courſe pulls him after it, and he is commonly killed by the fall. Should this accidentally not be the caſe, he drags the block again up the acclivity, and renews his efforts, till with increaſing fury he either ſinks to the ground, or kills himſelf by a deciſive plunge.

The white or polar bear (Ursus *Maritimus*) lives on the coaſt of the Frozen ocean, and in ſome of the eaſtern and northern iſles, where the chace of him is a collateral occupation of the mariners who viſit theſe coaſts for the capture of the morſe. Black bears are ſo numerous in Kamtſhatka, that they are ſeen roaming about the plains in troops, and muſt long ſince have been exterminated, if they were not here more tame and gentle than in any other part of the world. In ſpring, they deſcend from the mountains where they have wintered, to the mouths of the rivers for catching fiſh, which ſwarm in all the ſtreams of that peninſula. If the fiſh are plentiful, they eat only the heads; and when they find nets laid in any place, they dexterouſly drag them out of the water, and empty them of the fiſh. Towards autumn, when the fiſh go up the rivers, they advance with them gradually to the mountains. When a Kamtſhadale eſpies a bear, he endeavours to conciliate his friendſhip at a diſtance, accompanying his geſtures by courteous words. Indeed they are ſo familiar, that the women and girls, when they are gathering roots and herbs, or turf for fuel, are never diſturbed in their employment, even in the midſt of a whole drove of bears; and if one of theſe animals comes up to one of them, it is merely to take ſomething out of their hands. They have never been known to attack a man, except when they are rouſed from their ſleep, and they ſeldom turn upon the markſmen whether they be hit or not. Notwithſtanding this gentleneſs of the bear, its utility renders it a valuable object of prey. When the hunter and the bear meet, the conteſt is generally bloody, but it generally terminates to the advantage of the artful huntſman. Armed with ſpears and clubs, the Kamtſhadale goes in queſt of the peaceful bear in his calm retreat; who, thinking only of his defence, takes the faggots brought by his purſuer, and choaks with them the entrance into his den. The mouth of the cavern being cloſed, the hunter bores a hole through the top, and then with the greateſt ſecurity ſpears his defenceleſs foe. Tooke's View of Ruſſia, vol. ii. p. 442, &c.

Dr. Barton, in his "Fragments of the Natural Hiſtory of Pennſylvania," informs us, that the bears migrate in great numbers, every autumn acroſs the Miſſiſippi, proceeding ſouth, perhaps to the mountains of New Mexico, in ſearch of a milder climate. In the ſpring they return again by the ſame route. This migration of the bears is particularly obſerved at Manchar, on the Miſſiſippi.

Bear *leading*, to ſhew tricks, is an ancient practice, which we find prohibited in the canons of the church. Du-Cange.

Bear *wards urſarii*, were a kind of ſervants in great families among the Romans, who had the care of breeding and feeding thoſe animals. Pitiſc. Lex. Ant. tom. ii. p. 1110.

p. 1110. Our nobility had formerly officers of this kind. The annual salary of one of them belonging to the fifth earl of Northumberland was twenty shillings. Northumb. Household Book.

Bear-*Tribe*, in *Geography*, one of the tribes into which the American Indians of the Six Nations are distributed. See Six-Nations.

Bear, *Order of the*, was a military order in Switzerland, erected by the emperor Frederic II. in 1213, by way of acknowledgment for the service the Swiss had done him, and in favour of the abbey of St. Gal. To the collar of the order, which was a gold chain interlaced with a chaplet of oak-leaves, hung a medal of gold, on which was represented a bear raised on an eminence of earth; or a bear sable on a ground vert.

Bear-*berry*, in *Botany*. See Arbutus.

Bear-*bind*. See Convolvulus.

Bear's *breech*. See Acanthus.

Bear's *ears*. See Primula *Auricula*.

Bear's *ears sanicle*. See Verbascum.

Bear's *foot*. See Helleborus.

Bear-*a-hand*, a naval term, synonymous with make haste, or dispatch. See Bearing.

Bear's *Bay*, in *Geography*, or *Little Port*, lies at the east end of Anticosti island, at the mouth of the river St. Lawrence, in North America.

Bear's *Bay*, or *White Bear Bay*, is a very deep bay on the south coast of the island of Newfoundland, towards its west end.

Bear's *Cape*, the south-east point of St. John's island, near Nova Scotia, in North America. N. lat. 45° 53′. W. long. 62° 40′.

Bear *Cove*, lies on the east side of the south-eastern corner of the island of Newfoundland, at the head of which is the settlement of Formose. It is a good fishing-place for boats. Renean's rocks are situated between Bear-Cove and Fresh-water bay on the south, 32 miles northerly from cape Race.

Bear *Creek*, a water of Tennessee river. See Occochappo.

Bear's *Grass Creek*, a small creek on the eastern side of Ohio river, north of the town of Louisville, in Kentucky, and near it. A canal is proposed to be cut from this creek to the rapids of the Ohio, which would render the navigation of this river safe and easy. The country on the side of this creek, between Salt river and Kentucky river, is rich and beautiful.

Bear *Island*, an island near the entrance of Bantry bay, in the county of Cork, Ireland. It is about six miles long, and is very coarse, mountainous, and rugged, but is of great use in defending this noble bay from the fury of the south-west winds, so that vessels within the island may ride secure. N. lat. 51° 35′. W. long. 9° 45′. The whole bay was formerly called *Bearhaven*; but this name is now confined to that part between the island and the peninsula of *Bear*, on which is the small town of Castleton. Smith's Cork. Beaufort. See Bantry.

Bear, *and* Bantry, the name of a barony in the western part of the county of Cork, Ireland, which is very mountainous, and with the adjoining parts of Carbery and Muskerry, is the poorest and least improved part of the county.

Bear, *North*, a small island in St. James's bay, Hudson's bay. N. lat. 54° 40′. W. long. 80°.—Another small island in the same bay is called *South Bear*. N. lat. 54° 35′. W. long. 80°.

Bear, or *Cherry Island*, lies on the coast of Greenland, N. lat. 74° 28′. E. long. 17° 53′.

Bear *Lake*, *Great*, is situated in the north-west part of North America, near the Arctic circle, in N. lat. 65°, and W. long. 121°; and a river flows from it in a W. N. W. course, called Great Bear river, which runs into Mackenzie's river.

Bear *Lake*, *Black*, lies in New South Wales, North-west from Cumberland house. N. lat. 53° 30′. W. long. 107° 30′.

Bear *Lake*, *White*, lies due west from another small lake called Bear lake, both in N. lat. 48° 15′; and the former in W. long. 98° 30′. These lakes are said to give rise to the river Mississippi.

Bears, *White*, *Point of*, the east point of St. Peter's river, on the coast of Labrador, in North America, so called from the great number of bears that were seen there. N. lat. 51° 55′. W. long. 55° 30′.

Bear's *Port*, one of the ports on the coast of Nova Scotia, in North America, between port and cape de l' Heve to the north-east, and cape Sable, the south-west point of Nova Scotia.

Bear *River*, a river of the north-west part of North America, which runs into the Unjigah, or Peace river, in N. lat. 56° 12′. W. long. 119° 28′.

Great Bear *River*. See Bear *Lake*.

Bear *Rocks*, *New*, are situated about south by west from the extreme west point of the island of Jamaica. N. lat. 16° 20′. W. long. 78°. 55′.

Bear *Sound*, or *Barsund*, lies on the west coast of West Greenland. N. lat. 62° 20′. W. long. 49°.

Bear *Town*, a town of America, in Caroline county, Maryland, about 7 miles north of Greensburg, and about 15 south-east from Chester-town.

Bear, *to*, denotes to bring forth young, or to produce fruit.

BEARALSTON, in *Geography*. See Beeralston.

BEARD, John, in *Biography*, an energetic English singer, and an excellent actor, was brought up in the king's chapel. He knew as much of music as was necessary to sing a single part at sight; and with a voice that was more powerful than sweet, he became the most useful and favourite singer of his time, on the stage, at Ranelagh, at all concerts; and in Handel's oratorios he had always a capital part; being by his knowledge of music the most steady support of the choruses, not only of Handel, but in the odes of Green and Boyce. Having married for his second wife a daughter of Rich, the patentee of Covent-garden theatre, upon the death of his father-in-law, he became manager of that play-house, and discontinued all public singing; which a deafness that had been long encreasing rendered necessary. His first marriage was with a lady of quality, a sister of the late Earl of Walgrave, to whom he was a very indulgent and tender husband; and he proved himself to be a man of honour and principle in every transaction of his life. There were so much intelligence and humour in his acting and singing comic parts on the stage, and Scots and Irish ballads in private, as well compensated for deficiencies of voice. He was closely united by friendship to Dr. Boyce, in the performance of whose music he manifested a zeal and even a partiality which were not discoverable for that of any other composer. He died in 1791.

Beard, in *Geography*, a town of France, in the department of Nievre, and chief place of a canton in the district of Decize, on the Loire; 10 miles S. E. of Nevers.

Beard, in *Physiology*, the hair growing on the chin, and adjacent parts of the face; chiefly of adults and males.

Various have been and still are the ceremonies and customs of different nations with regard to the beard: Kingston assures us, that a considerable branch of the religion of the Tartars consists in the management of their beards; and that they waged

waged a long and bloody war with the Perſians, and declared them infidels, though, in other reſpects, of the ſame faith with themſelves, merely becauſe they would not cut their whiſkers after the mode or rite of the Tartars. The Spartans, from the age of 20 years, ſuffered their hair and beards to grow: the hair being deemed an ornament, which became the freeman and warrior. A Spartan being once aſked why he wore ſo long a beard, replied, "Since it is grown white it inceſſantly reminds me not to diſhonour my old age." Nevertheleſs, as they were accuſtomed to obedience, even in things the moſt indifferent, the ephori, when they entered on office, proclaimed, by ſound of trumpet, a decree, commanding the people to ſhave their upper lips, and to ſubmit to the laws. The Egyptian prieſts ſhaved the head, chin, and whole body. Accordingly, moſt of the Egyptian figures are without beard. However, Herodotus informs us, that in time of calamity, they ſuffered their beard and hair to grow. The Aſſyrians had long beards; and Chryſoſtom obſerves, that the kings of Perſia had their beards woven or matted together with gold thread; and ſome of the firſt kings of France had, in the ſame manner, their beards matted and knotted with gold. The Africans wore long beards, as may be ſeen on the medals of Juba. The Greeks, if tradition may be credited, wore long beards from their heroic times. Cedrenus informs us, that at Conſtantinople, in the thermæ of Zeuxippus, there was a ſtatue of Homer with a long beard.

Athenæus, from Chryſippus, obſerves, that the Greeks always wore their beards till the time of Alexander; and that the firſt who cut it at Athens ever after bore the addition of κοφσης, *ſhaven*, on medals. Plutarch adds, that Alexander commanded the Macedonians to be ſhaven, leaſt the length of their beards ſhould give a handle to their enemies: however this be, we find Philip, his father, as well as Amyntas and Archelaus, his predeceſſors, repreſented on medals without beards. The Greeks continued to ſhave the beard till the time of Juſtinian, under whoſe empire long beards came again into faſhion, and ſo continued till Conſtantinople was taken by the Turks. The Greek philoſophers diſtinguiſhed themſelves from the vulgar by their long beards. According to Laertius (l. vi.) Antiſthenes was the firſt of the philoſophers who ſuffered his beard to grow. This cuſtom, however, among the philoſophers, was not invariable, for the ſcholiaſt of Ariſtophanes (Nub. 120.) pretends, that the ancient philoſophers ſhaved their beards. The Roman philoſophers affected to preſerve the ſame diſtinctive characters of the mantle and long beard.

Thus Horace deſcribes them:

——"Tempore quo me
Solatus juſſit ſapientem paſcere barbam."
Sermon. l. ii. ſat. iii. v. 34.

Aulus Gellius and Lucian expreſs themſelves in a ſimilar manner. Perſius ſeems to have been ſo convinced of the beard's being the ſymbol of wiſdom that he thought he could not beſtow a greater encomium on Socrates than calling him "Magiſtrum barbatum." The Sicilians, and the Etruſcans, adopted the cuſtoms of the Greeks. The latter exhibited all their deities with a beard, except Vulcan, but on the medals of the former their kings appear without a beard.

The Romans for a long time wore beards and long hair. Cicero, in his oration for Cœlius, (c. 14.) mentions the "barba horrida, quam in ſtatuis antiquis & imaginibus videmus." Livy (v. 51.) ſpeaking of the ſenators, who remained in Rome, after the entrance of the Gauls, ſays that they wore a very long beard: "barbam, ut tum omnibus promiſſa erat." Scipio Africanus appeared with a long beard in his interview with Maſiniſſa. Hence Ovid calls the ancient Romans "intonſi;" thus,

"Hoc apud intonſos nomen habebat avos." Faſt. ii. 26.

Juvenal alſo (Sat. xvi.) deſcribes them in the ſame manner.

"Et credam dignum barbâ, dignumque capillis
Majorum."

Pliny obſerves, that the Romans did not begin to ſhave till the year of Rome 454, when P. Ticinius brought over a number of barbers from Sicily; he adds, that Scipio Africanus was the firſt who introduced the mode of ſhaving every day. The philoſophers, however, retained the beard; and the military men wore it ſhort and frizzled, as we ſee it upon the triumphal arches, and other monuments. In time of grief and affliction they ſuffered their beard and hair to grow, as was the caſe with M. Livius in his retirement from Rome, and with Auguſtus after the defeat of Varus. The Greeks, on the contrary, in time of grief, cut their hair and ſhaved their beards, (Seneca Benef. v. 6.) which was alſo the cuſtom among ſome barbarian nations. Accordingly, the cuſtom of letting the beard grow is a token of mourning in ſome countries, and of ſhaving it in others. The firſt fourteen Roman emperors ſhaved, till the time of the emperor Adrian, who retained the mode of wearing the beard. Plutarch tells us he did it to hide the ſcars in his face.

Antoninus Pius and Marcus Aurelius wore a beard under the character of philoſophers. The ſucceſſors of Juſtinian reſumed the habit of wearing beards, and the latter Greek emperors had them of an extraordinary length. The ancient Britons in the time of Cæſar ſhaved the reſt of the body, except the head and upper lip: "Capillos ac barbam radere præter caput, et labrum ſuperius." Bell. Gall. l. v. c. 14. Diodorus Siculus and Tacitus inform us, that the ancient Germans ſhaved the beard, except that on the upper lips; and, among the Catti, a nation of Germany, a young man was not allowed to ſhave or cut his hair till he had ſlain an enemy. Tac. de Mem. Germ. 31. Among the Jews it was reckoned ignominious to ſhave a perſon's beard. 2 Sam. x. 4. Strabo relates, that the Indian philoſophers, the Gymnoſophiſts, took great pains to attract the veneration of the people by the length of their beards. The Goths and Franks wore only a muſtache, called by Plutarch μυσακα, and by the Latins "criſta." While the Gauls were under their ſovereignty, none but the nobles and Chriſtian prieſts were allowed to wear long beards. When the Franks made themſelves maſters of Gaul, they aſſumed the ſame authority as the Romans; the bondſmen were expreſsly ordered to ſhave their chins; and this law continued in force till the entire abolition of ſervitude in France. In the time of the firſt race of kings, a long beard was a ſign of nobility and freedom; and the kings were emulous to have the largeſt beards. Eginard, ſecretary to Charlemagne, ſpeaking of the laſt kings of the firſt race, ſays, they came to the aſſemblies in the field of Mars, in a carriage drawn by oxen, and ſat on the throne with their hair diſhevelled, and a very long beard.

It is not eaſy to fix with preciſion the time when the beard was firſt ſhaven among the young Romans. It was ſometimes when the toga virilis was aſſumed, according to Suetonius (Calig. 10.) Macrobius (Somn. Scip. i. 6.) ſays, it was about the age of 21. Auguſtus did not ſhave before the age of 25. Hence young men with a long down, or "lanugo," upon the chin, were called "juvenes barbatuli," or "benè barbati." The firſt growth of the beard was conſecrated to ſome god, uſually to the Lares. Nero conſecrated his in a golden box, ſet with pearls, to Jupiter Capitolinus. The day on which the young men, among the Greeks and Romans firſt ſhaved the beard, was a feſtival; viſits of ceremony were paid them; and they received preſents from their friends. To this purpoſe, Juvenal ſays, Sat. iii. 186.

"Ille

"Ille metit barbam, crinem hic deponit amati:
"Plena domus libis genialibus."

Slaves, among the Romans, wore their beard and hair long; when manumitted they shaved the head in the temple of Feronia, and put on a cap, or "pileus," as a badge of liberty. Those who escaped from shipwreck, shaved their heads; and persons acquitted of a capital crime, cut their hair and shaved, and went to the capitol to return thanks to Jupiter.

Persons of quality had their children shaved the first time by others of the same, or greater quality, who by this means became godfathers, or adoptive fathers of the children. Anciently, indeed, a person became god-father of the child by barely touching his beard; thus historians relate, that one of the articles of the treaty between Alaric and Clovis was, that Alaric should touch the beard of Clovis to become his godfather.

As to ecclesiastics, the discipline has been very different on the article of beards: sometimes they have been enjoined to wear them, from a notion of too much effeminacy in shaving, and that a long beard was more suitable to the ecclesiastic gravity; and sometimes again they were forbid it, as imagining pride to lurk beneath a venerable beard. The Greek and Romish churches have long disputed together about their beards; since the time of their separation, the Romanists seem to have given more into the practice of shaving, by way of opposition to the Greeks; and have even made some express constitutions "de radendis barbis." The Greeks, on the contrary, espouse very zealously the cause of long beards, and are extremely scandalized at the beardless images of saints in the Roman churches.

By the statutes of some monasteries, it appears, that the lay-monks were to let their beards grow, and the priests among them to shave; and that the beards of all that were received into the monasteries were blessed with a great deal of ceremony; and there are still extant the prayers used in the solemnity of consecrating the beard to God, when an ecclesiastic was shaven.

Le Comte observes, that the Chinese affect long beards extravagantly; but nature has balked them, and only give them very little ones, which, however, they cultivate with great care: the Europeans are strangely envied by them on this account.

The Russians wore their beards till within these few years, when the czar Peter enjoined them all to shave; but, notwithstanding his injunction, he was obliged to keep on foot a number of officers to cut off by violence the beards of such as would not otherwise part with them. For enforcing his regulation, which was violently opposed, he laid a tax on long beards, and many submitted to it rather than part with their beard, which was universally held to be an ornament to the person. Superstitious Russians even thought it to be an external characteristic of the orthodox faith; and those who were too poor, or too parsimonious, to pay the tax for retaining the beard, religiously preserved the beard that was shorn off, and had it deposited in the coffin with them on their decease, that they might present it to St. Nicholas, on his refusing to admit them, as beardless christians, into the kingdom of heaven. As a proof of the high estimation in which the beard was held in Russia in early times, it is a law in the Nowgorodian code, that whoever plucks hair from another's beard shall be mulcted four times as much as for cutting off a finger.

In the 12th century, king Robert of France, the rival of Charles the simple, was not more famous for his exploits than for his long white beard, which he suffered to hang down on the outside of his cuirass, to encourage the troops in battle, and to rally them when defeated. Upon the death of the great Henry IV. of France, who was succeeded by a beardless youth, the beard was proscribed. Louis XIII. ascended the throne of his glorious ancestor without a beard; and his courtiers immediately reduced their beards to whiskers, and a small tuft of hair under the lower lip. The duke of Sully, however, though he encountered ridicule, would never adopt this effeminate custom. Whiskers continued in fashion in the commencement of the reign of Louis XIV. who, as well as his courtiers, were proud of wearing them; so that they were the ornament of Turenne, Condé, Colbert, Corneille, Moliere, &c.

In Spain, Philip V. ascended the throne with a shaved chin; and the courtiers imitated the prince, and their example was followed by the people. The change, however, produced lamentations and murmur. Hence arose the Spanish proverb, denoting, "Since we have lost our beards, we have lost our souls." The Portuguese, whose national character is much the same, have imitated them in this respect. Accordingly we read, that in the reign of Catherine queen of Portugal, when the brave John de Castro had taken the Castle of Diu, in India, he was under the necessity of borrowing from the inhabitants of Goa a thousand pistoles for the maintenance of his fleet; and that as a security for the loan, he sent them one of his whiskers, telling them "all the gold in the world cannot equal the value of this national ornament of my valour; and I deposit it in your hands as a security for the money." The inhabitants of Goa, it is said, generously returned both the money and his whiskers.

We have already observed, that the ancient Britons, in the time of Cæsar, shaved the body, except the head and the upper lip; the hair of which they, as well as the Gauls, allowed to grow to a very inconvenient length. The Anglo-Saxons, on their arrival in Britain, and for a considerable time after, allowed their beards to grow, as well as their near neighbours the Longobards, to whom in every respect they bore a near resemblance. After the introduction of Christianity, their clergy were obliged to shave their beards, in obedience to the laws, and in imitation of all the western churches. This distinction between the clergy and the laity subsisted for some time; and a writer of the seventh century complains, that the manners of the clergy were so corrupted that they could not be distinguished from the laity by their actions, but only by their want of beards. By degrees the English laity began to imitate the clergy so far as to shave all their beards except their upper lips, on each of which they left a lock of hair; by which they were distinguished from the French and Normans, who shaved their whole beards. The Normans had as great an aversion to beards as they had a fondness for long hair. Among them, to allow the beard to grow, was an indication of the deepest distress and misery. They not only shaved their beards themselves, but when they had authority, they obliged others to imitate their example. It is mentioned by some of our ancient historians, as one of the most wanton acts of tyranny in William the Conqueror, that he compelled the English, who had been accustomed to allow the hair of their upper lips to grow, to shave their whole beards. This was so disagreeable to some of that people, that they chose rather to abandon their country than resign their whiskers. In the fourteenth century long beards were in fashion, and continued to the sixteenth century; so that in the reign of Mary I. the beards of bishop Gardiner and cardinal Pole, appear in their pourtraits to be of a most uncommon size. The lawyers, however, had a regulation imposed upon this important feature. Towards the close of the sixteenth century, the beard was much lessened, and gradually dwindled into mustachios or whiskers: and in process of time the practice of shaving the whole face became universal.

Among

Among the Turks, it is more infamous for any one to have his beard cut off, than among us to be publickly whipt, or branded with a hot iron. They who ſerve in the ſeraglio have their beards ſhaven as a token of ſervitude; and when they are ſet at liberty, they permit it to grow. With them and the Perſians the beard is a mark of authority and liberty; and the want of muſtachios and beards diſcriminates ſlaves and women. Hence, it is ſaid, ariſes the unfavourable idea which they form on the firſt ſight of an European. There are many in that country who would prefer death to this kind of puniſhment. The Arabs make the preſervation of the beard a capital article of religion, becauſe Mahomet never cut his. The Moors of Africa hold by their beards while they ſwear, in order to give validity to their oath, which after this formality they rarely violate.

The Turkiſh wives kiſs their huſbands' beards, and children their fathers', as often as they come to ſalute them. The men kiſs one another's beards reciprocally on both ſides, when they ſalute one another in the ſtreets, or come off from a journey.

The Jews wear a beard on the chin, but not on the upper lip or cheeks. Moſes forbids them to cut off entirely the angle or extremity of their beard; that is, to imitate the Egyptian faſhion, who left only a ſmall tuft at the extremity of the chin; whence the Jews to this day ſuffer a little fillet of hair to grow from the lower end of their ears to their chins, where, as well as on their lower lips, their beards form a pretty long bunch. In time of mourning the Jews neglected to trim their beards, that is, to cut off what was ſuperfluous on the upper lips and cheeks. In time of great affliction they alſo plucked off the hair of their beards.

It has been advanced by ſeveral hiſtorians and travellers, that the Indians of America differed from other males of the human ſpecies in the want of one very characteriſtic mark of the ſex, viz. that of a beard. From this general obſervation, the Eſquimaux have been excepted; and hence it has been ſuppoſed, that they had an origin different from that of the other natives of America. Mr. Cauſland, after ten years reſidence at Niagara, in the midſt of the Six Nations, with frequent opportunities of ſeeing other nations of Indians, affirms, that they do not differ from the reſt of men in this particular more than one European differs from another; and as this imperfection has been attributed to the Indians of North America, equally with thoſe of the reſt of the continent, he inclines to think, that the aſſertion is as void of foundation in one region as it is in the other. All the Indians of North America, ſays this writer, except a very ſmall number, who, from living among white people, have adopted their cuſtom, pluck out the hairs of the beard; and as they addict themſelves to this practice from its firſt appearance, it may be ſuppoſed, that to a ſuperficial obſerver, their faces will ſeem ſmooth and beardleſs. As farther proofs that they have beards, he alleges that all of them have an inſtrument which they uſe for plucking out the hairs; that when they neglect this for ſome time, hairs ſprout up, and are ſeen upon the chin and face; that many Indians allow tufts of hair to grow upon their chins or upper lip; and that ſeveral of the Mohocks, Delawares, and others, who live among white people, ſometimes ſhave with razors, and ſometimes pluck their beards out. Accordingly, colonel Butler affirms, that the men of the Six-Nation Indians have all beards naturally, which is alſo the caſe with reſpect to all other nations of North America, which he has had an opportunity of ſeeing: but that it is the general practice of the Indians to pluck out the beard by the roots from its earlieſt appearance; and hence their faces appear ſmooth. The ſame fact is confirmed by Captain Brent. Phil. Tranſ. vol. lxxxvi. p. 229. &c.

Beard, *anointing the*, with unguents, is an ancient practice both among the Jews and Romans, and ſtill continues in uſe among the Turks; where one of the principal ceremonies obſerved in ſerious viſits, is to throw ſweet-ſcented water on the beard of the viſitant, and to perfume it afterwards with aloes wood, which ſticks to this moiſture, and gives it an agreeable ſmell, &c.

In *Middle age Writers* we meet with *adlentare barbam*, uſed for ſtroking and combing it to render it ſoft and flexible.

The Turks, when they comb their beards, hold a handkerchief on their knees, and gather very carefully the hairs that fall; and when they have got together a certain quantity, they fold them up in a paper, and carry them to the place where they bury the dead.

Beard, *plucking the*, was practiſed to Cynics by way of contempt. The Stoics, as well as Cynics, affected to be inſenſible to injury, and their patience was tried by this practice. Socrates was not exempt from this ſpecies of inſult and perſecution, as we are informed by Diogenes Laertius. Horace ſays to a perſon of this deſcription:

"————Vellunt tibi barbam
Laſcivi pueri." Sermon. Sat. 3, 133.

And Perſius (Sat. i. 133.)

"Si Cynico barbam petulans Nonaria vellat."

The ſame ſatyriſt repreſents Jupiter as offering his beard to be plucked by Dionyſius the tyrant:

"Idcirco ſtolidam præbet tibi vellere barbam
Jupiter."

Some authors alſo ſpeak of *mortgaging the beard*, *barbam hypothecare*. Du-Cange.

Beard, *touching the*, was an action anciently uſed by ſupplicants, and by thoſe who made vows. An inſtance of this is found in Homer (Il. K. 454.): and Pliny (ii. 45.) ſays, that the ancient Greeks had a cuſtom of touching the chin of a perſon, whoſe compaſſion they wiſhed to excite; the chin being ſubſtituted for the beard. Inſtances of a ſingular kind occur in the Oreſtes and Hecuba of Euripides. To touch any one's beard, or cut off a ſmall part of it, was among the ancient French, the moſt ſacred pledge of protection and confidence. For a long time all letters, iſſuing from the ſovereign, had, for greater ſatisfaction, three hairs of his beard in the ſeal. A charter of 1121, ſtill extant, concludes with the following words: "Quod ut ratum et ſtabile perſeveret in poſterum, præſentis ſcripto ſigilli mei robur appoſui cum tribus pilis barbæ meæ."

Beard, *falſe*, *barba falſa*, was an artificial one. In a general court of Catalonia, held in 1351, it is expreſsly enjoined, "Ne quis barbam falſam ſeu fictam audeat deferre vel fabricare." Du-Cange.

Hottoman has given an elegant dialogue *de barba*, firſt printed by Plantin in 1586.

Beard, or *under-beard*, called alſo *chuck*, of a horſe, is that part under the lower mandible on the outſide, and above the chin, which bears the curb of the bridle.

Beard, *old-man's*, in *Botany*. See Clematis.

Beard *of a Comet*, denotes the rays which the comet emits towards that part of the heavens to which its proper motion ſeems to direct it. Thus, the beard of the comet is diſtinguiſhed from the *tail*, which is underſtood of the rays emitted towards that part from which its motion ſeems to carry it. It is called beard from ſome fancied reſemblance it bears to the beard of a man; or becauſe it is projected before the comet.

Beard, in *Conchology*, the byſſus of the *pinna*, the *muſcle*, &c. an aſſemblage of threads or hairs of a ſtout texture that hangs from the body of the animal, and by means of which it

it fastens itself to stones, or any other heavy substance; the hairs of the beard terminating in a spungy substance, that adheres very tenaciously to the smoothest surfaces. The thread of this kind of byssus is sometimes woven as an object of curiosity into gloves, stockings, &c. and in point of durability at least, cannot be inferior to any other material that could be employed for that purpose. Some notice is taken of this among ancient writers, who speak of it as a kind of silk. See SILK.

BEARDED, *barbatus*, denotes a person or thing with a beard, or some resemblance thereof.

In *Middle Age Writers*, this is sometimes expressed by *malibarbis*, q. d. *barba in malis seu genis*.

The faces on ancient Greek and Roman medals are generally bearded. Some are denominated *pogonati*, as having long beards, e. gr. the Parthian kings. Others have only a *lanugo* about the chin, as the Seleucide family. Adrian was the first of the Roman emperors who nourished his beard: hence all imperial medals before him are beardless: after him, bearded.

The medals of gods, and heroes, in vigorous youth, represent them beardless, except Jupiter, and a few others.

The Romans paid their worship to a bearded Venus, *Veneri barbatæ*, supposed to have been of both sexes; a statue of whom was also found in the isle of Cyprus. The reason of representing the goddess of beauty with a beard is variously guessed at by the learned.

BEARDED *women* have been all observed to want the menstrual discharge; and several instances are given by Hippocrates, and other physicians, of grown women, especially widows, in whom, the menses being stopped, beards appeared. Eusebius Nieurembergius mentions a woman, who had a beard reaching to her navel. Bartholin speaks of a bearded woman at Copenhagen, who partly, in virtue thereof, passed for an hermaphrodite.

BEARDED *brothers*, *fratres barbati*, in *Ecclesiastical Writers*, are those otherwise called *fratres conversi* in the order of Grammont and the Cistercians. They took this denomination because they were allowed to wear their beards contrary to the rule of the professed monks.

BEARDED *husk*, among *Florists*, a husk which is hairy on the edges, as is that of the rose, &c.

BEARDING, in *Carpentry*, denotes diminishing any piece of timber from a given line on its surface, to make the thickness less on the edge.

BEARDING *of wool*, in the *Manufacture*. See WOOL.

BEARDSTOWN, in *Geography*. See BAIRDSTOWN.

BEARER, in *Architecture*, any subsidiary or intermediate support in aid of the principal supports, as the small joists or brackets which bear a gutter or the covering board of a cornice, the piers and blockings under the joints of a ground floor: or the joists, &c. which bear any thing independent of or unconnected with the building, as the bearers of a cistern, of a vat, of a platform.

BEARERS, *gestantes*, in *Middle Age Writers*, are sometimes used for a child's gossips, because they hold the infant in their arms, and present him to the priests in the ceremony of baptism. Du-Cange.

BEARERS *of a bill of exchange*, denote the persons in whose hands it is, and in favour of whom the last order or indorsement was made. See BILL *of* EXCHANGE.

When a bill is said to be payable to bearer, it is understood to be payable to him who first offers himself after it becomes due. To be paid a bill of this kind, there needs neither order nor transfer; yet it is good to know to whom it is paid.

BEARERS are more particularly used for those who carry the dead to their graves.

In a sense somewhat different from this, we also say *pall-bearers*, &c.

The ancients had peculiar orders or officers of bearers, called by the Greeks κοπιάται; by the Romans, *lecticarii*. The *vespillones*, or *bajuli*, were a lower sort of bearers, appointed for persons of inferior rank.

BEARERS, in *Horticulture*, denote the fruit branches, or such as bear fruit.

The bearers, or bearing branches of an apple-tree, and the like, are found to be rougher, and fuller of asperities in their bark, than the other branches.

BEARERS, in *Heraldry*, see SUPPORTERS.

BEARER, *Cross*. See CROSS.

BEARERS, in *Law*, denote such as bear down and oppress others, and are said to be the same with maintainers. By stat. 4 Edw. III. c. 11. justices of assize shall enquire of, hear, and determine maintainers, bearers, and conspirators, &c.

BEAR-HAVEN, in *Geography* a commodious harbour formed by the island of Bear, near the mouth of Bantry bay in the county of Cork, Ireland, into which ships of war and merchantmen often put for shelter; but the adjoining village of Castletown affords them few resources, and no accommodation. Beaufort's Memoir.

BEARING, in *Geography* and *Navigation*, the situation of one place from another, with regard to the points of the compass; or the arc of the horizon, that lies between the meridian of a place and a line passing from that place to another; or the angle which a line drawn through the two places makes with the meridians of each.

In other words, the bearing of an object in navigation, is the rhumb on which it is seen; and the bearing of one place from another is reckoned by the name of the rhumb passing through those two places. In every figure relating to any case of plain sailing, the bearing of the line not proceeding from the centre of the circle or horizon, is found by drawing a line parallel to it from the centre and towards the same quarter.

To find the bearing of any two places, e. g. cape Clear, and the island of Saint Michael's, one of the Azores, by the plain chart; lay a ruler by the two places, take the nearest distance between the centre of the compass, and the edge of the ruler; and in this position, slide one point of the compasses along the ruler, and the other point will run along the point of the compass, shewing the bearing, which in this case is S.W.; that is, St. Michael's lies to the S.W. of cape Clear, or cape Clear to the N. E. of St. Michael's. See SAILING.

To find the bearing of any two given places on the globe; lay the graduated edge of the quadrant of altitude over both places, the beginning, or 0, being on one of them, and observe, while the quadrant lies in this position, what rhumb of the nearest fly, or compass, runs mostly parallel to the edge of the quadrant, and that rhumb shews the bearing sought, nearly.

The bearings of places on the ground are usually determined from the magnetic needle: in the managing of these lies the principal part of surveying; since the bearing and distance of a second point from the first being found, the place of that second is determined; or the bearings of a third point from two others, whose distance from each other is known, being found, the place of the third is determined: instrumentally we mean; for to calculate trigonometrically, there must be more data. Mr. Collins gives the solution of a problem in the Philosophical Transactions, where the distances of three objects on the same plane being given, and the bearings from a fourth place in the same plane observed,

ſerved, the diſtances from the place of obſervation to the reſpective objects are required. See SURVEYING.

BEARING, in the *Sea Language*.- When a ſhip ſails towards the ſhore, ſhe is ſaid to *bear in with the land*.—When a ſhip that was to windward, comes under another ſhip's ſtern, and ſo gives her the wind, ſhe is ſaid to *bear under her lee*.—If a ſhip ſails into a harbour with the wind large, or before the wind, ſhe is ſaid to *bear in with the harbour*, &c.

In conding they ſay, *bear up the helm*, that is, let the ſhip go more large before the wind—*bear up round*, that is, let the ſhip go between her two ſheets, directly before the wind —*bear a hand*, i. e. make haſte.

They alſo ſay a ſhip *bears* when, having two ſlender a quarter, ſhe will ſink too deep into the water with an over light freight, and therefore can carry but a ſmall quantity of goods.

BEAR *ſail well, to*, is ſaid of a ſhip when ſhe is a ſtiff-guided ſhip, and will not couch down on a ſide, with a great deal of ſail.

When a ſhip is ſaid to *bear out her ordnance*, it is meant, that her ordnance lies ſo high, and ſhe will go ſo upright, that in reaſonable fighting weather, ſhe will be able to keep out her lower tier, and not be forced to ſhut in her ports.

A ſhip is ſaid to *overbear* another, when it is able, in a great gale of wind, to carry out more ſails, viz. a top-ſail, more, or the like.

BEARING *off* is alſo uſed by *Seamen* generally in buſineſs belonging to the ſhipping, for *thruſt off*.

Thus, in hoiſting any thing into the ſhip, if it hath hold by any part of the ſhip or ordnance, or the like, they ſay, *bear it off from the ſhip's ſide*.—So if they would have the breech or mouth of a piece of ordnance, or the like, put from one, they ſay, *bear off* or *bear about* the breech.

BEARING *up*, or *bearing away*, is improperly uſed to denote the act of changing the courſe of a ſhip, in order to make her ſail before the wind, after ſhe had ſailed ſome time with a ſide wind or cloſe-hauled.

BEARING alſo expreſſes the ſituation of any diſtant object, eſtimated from ſome part of the ſhip, according to her poſition. In this ſenſe, the object muſt be either a-head, a-ſtern, on the beam, before the beam, abaft the beam, on the lee or weather bow, and on the lee or weather quarters.

BEARING *of a piece of timber*, in *Carpentry*, denotes the ſpace either between the two fixed extremes thereof, when it has no other ſupport; which is called *bearing at length*: or between one extreme, and a poſt, brick wall, or the like, trimmed up between the ends to ſhorten its bearing.

Joiſts are not to bear above ten feet length; nor ſingle rafters more than nine feet. 19 Car. II. c. 3.

BEARING *of an arch* or *vault*, denotes the effort which the ſtones make to burſt open the piers, or *piedroits*.

This amounts to the ſame with what the French call *pouſſée*.

BEARINGS, in *Heraldry*, a term uſed to expreſs a coat of arms, or the figures of armories, by which the nobility and gentry are diſtinguiſhed from the vulgar, and from one another. See ARMS.

BEARING *of an organ pipe*, denotes an error or variation from the juſt ſound it ought to yield. See TEMPERATURE.

BEARING *pains*, in *Midwifery*. The pains in labour or child birth are ſaid to be bearing pains when they force the child downward.

BEARING *down of the womb*, *vagina* or *anus*. When the uterus deſcends from the upper part of the pelvis, and preſſes upon or paſſes through the os externum, it is called a bearing down (procidentia) of the womb. In this caſe the uterus is included in a duplicature of the vagina, to the upper part of which it is attached. Women who are troubled with the whites (fluor albus) or who have borne children, particularly if the perinæum was injured, or torn, at the time of the birth of any of them, are moſt ſubject to this complaint. It manifeſts itſelf at firſt by a ſenſe of dragging or bearing down of the part; ſome time after, there is a difficulty in making water, the uterus lying on, and covering the meatus urinarius. In this ſtage of the complaint, on paſſing a finger into the vagina, it meets the os uteri, immediately on getting through the os externum. If not now remedied, the uterus continues deſcending, until it frees the os externum, and hangs down between the thighs; and if ſtill neglected, the part protruded goes on increaſing, from the ſize of a nut to that of a large pear, and in ſome caſes the uterus, covered with the vagina, has been found hanging down beyond the middle of the thighs, and of the ſize of the body of a Florence flaſk. When a fold of the vagina only deſcends, and paſſes through the os externum, it is called a bearing down (procidentia) of the vagina. A ſimilar indiſpoſition affects the rectum, a fold of the gut being forced through the ſphincter ani, whenever the fæces are voided. This complaint is particularly incident to weakly children, though adults are not unfrequently affected with it. As in all theſe caſes there is a relaxed tone of the fibres, the cure is to be effected by the exhibition of ſuch things as ſtrengthen and increaſe the tone and elaſticity of them, by the Peruvian bark and chalybeats, the uſe of the cold bath, exerciſe, air, aſtringent applications to the parts, as decoctions of oak bark, pomgranate ſhells, ballauſtine flowers, red roſe leaves, &c. to which a portion of red port wine is to be added, and the medicine ſo prepared is to be injected into the vagina or rectum, and compreſſes ſoaked in it, applied to the parts externally, taking care in the mean while that the body be kept moderately open. When the womb is the part bearing down, in addition to theſe remedies, after returning the womb to its proper ſituation, a peſſary is to be introduced into the vagina and worn there to prevent its deſcending again. See PESSARY; ſee alſo PROCIDENTIA *Uteri*, *Vaginæ*, *et Ani*.

BEARING *claws*, among *cock fighters*, denote the foremoſt toes, on which the bird goes; and if they be hurt or gravelled, he cannot fight.

BEARING *of a ſtag*, is uſed in reſpect of the ſtate of his head, or the croches which he bears on his horns.

If you be aſked what a ſtag *bears*, you are only to reckon the croches, and never to expreſs an odd number: as, if he have four croches on his near-horn, and five on his far, you muſt ſay he bears ten; a falſe right on his near horn: if but four on the near horn, and ſix on the far horn, you muſt ſay he bears twelve; a double falſe right on the near horn.

BEARN STONE, ſee PHOSPHORUS.

BEARN, in *Geography*, was a province of France, before the revolution, at the foot of the Pyrenées, about 16 leagues long and 12 broad; bounded on the eaſt by Bigorre, on the north by Armagnac, Turſan, and Chaloſſe, on the weſt by Dax, a part of Soule, and lower Navarre, and on the ſouth by the Pyrenées. The plain country is very fertile, producing flax and Indian corn, and the mountains are covered with fir-trees, and within them are mines of copper, lead, and iron, and the leſſer hills are planted with vines, which yield good wine. The Spaniards are ſupplied from hence with horſes and cattle, and alſo with linen, of which there is in this province a conſiderable manufactory. The principal rivers which bear the name of Gaves, are the Gave-Bearnais, and the Gave d'Oleron. Bearn forms now the department of the Lower Pyrenées; and its capital is Pau.

BEAST, in *Zoology*, an appellation given to all four-footed

footed animals, fit for food, labour, or ſport. See BRUTE, and ZOOLOGY.

Authors make this difference between "beaſts of the foreſt" and "of chaſe," that the firſt are "ſilveſtres tantum," the latter "campeſtres tantum." "Beaſts of the foreſt" make their abode all the day time in the great coverts and ſecret places of the woods; and in the night ſeaſon they repair into the lawns, meadows, paſtures, and pleaſant feeding-places: whence their denomination "ſilveſtres," q. d. beaſts of the wood.

"Beaſts of the chaſe" reſide all the day time in the fields, and on the mountains afar off, to prevent ſurpriſe; but on night's approach, they feed, as the reſt, in meadows, &c. whence their appellation "campeſtres," q. d. beaſts of the field.

In our Statute books, "beaſts of chaſe" are five; the buck, doe, fox, martin, and roe. "Beaſts of the foreſt," called beaſts of venery, are the buck, hind, boar, and wolf: and "beaſts and fowls of the warren" are, the hare, coney, pheaſant, and partridge. See GAME.

No other, according to Manwood, are accounted beaſts or fowls of warren, than hares, coneys, pheaſants, and partridges. Lord Coke is of another opinion, diſtinguiſhing beaſts of the warren, from fowls of the warren. Under the former he includes hares, coneys, and roes: the latter he divides into *ſilveſtres*, *campeſtres*, and *aquatiles*. To the firſt belong the pheaſant, woodcock, &c. to the ſecond the partridge, quail, rail, &c. to the third the mallard, hern, &c. Coke on Littleton, p. 233.

BEAST *of burden* is underſtood of all quadrupeds employed in carrying goods on their backs. To this claſs belong elephants, dromedaries, camels, horſes, mules, aſſes, and the ſheep of Mexico and Peru.

BEAST, in *Games of Chance*, a game at cards, played thus; the beſt cards are the king, queen, &c. of which are formed three heaps, denominated the king, the play, and the troilet. Three, four, or five may play; and to every one are dealt five cards. Before the play every one ſtakes to the three heaps. He that wins moſt tricks takes up the heap called the play: he that has the king takes up the heap, ſo called; and he that has three of any ſort, as three fours, three fives, three ſixes, &c. takes up the troilet heap.

BEAST *at ombre*, is where the player or perſon that undertakes the game, loſes it to the other two; the penalty of which is a forfeiture equal to the ſtake played for.

BEASTAN, in *Geography*, a town of Perſia, in the province of Segeſtan, 80 miles S.W. of Kin.

BEASTS, *rother*, ſee ROTHER.

BEAT, in *Fencing*, denotes a blow or ſtroke given with the ſword. There are two kinds of beats, the firſt performed with the foible of a man's ſword on the foible of his adverſary's, which in the ſchools is commonly called baterie, from the French batre, and is chiefly uſed in a purſuit, to make an open upon the adverſary. The ſecond and beſt kind of beat is performed with the fort of a man's ſword upon the foible of his adverſary's, not with a ſpring, as in binding, but with a jerk, or dry beat; and is therefore moſt proper for the parades without or within the ſword, becauſe of the rebound a man's ſword has thereby from his adverſary's, whereby he procures to himſelf the better and ſurer opportunity of riſpoſting.

BEAT, ST., in *Geography*, a town of France, in the department of the upper Garonne, and chief place of a canton, in the diſtrict of St. Gaudens, on the Garonne. All the houſes are built of marble, the neighbourhood ſupplying no other materials. It is ſeated between two mountains, cloſe to the town on each ſide. The place contains 1056 and the canton 9588 inhabitants: the territory includes 247½ kilometres and 25 communes. N. lat. 42° 50'. W. long. 1° 6'.

BEAT, ST., *mountains of*, are mountains of Swiſſerland in the canton of Berne, near the lake Thun; the rocks of which are calcareous and rugged, and containing in a few places broken petrifactions. Some of theſe rocks are perpendicular, and even impending, and are marked at different elevations with furrows, occaſioned by the waters of the lake, which in former periods was probably ſeveral hundred feet above its preſent level.

BEAT, in *Horology*. See BEATS.

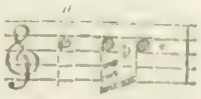
BEAT, in the *Manege*. A horſe is ſaid to beat the duſt, when, at each ſtroke or motion, he does not take in ground or way enough with his fore-legs. He is more particularly ſaid to beat the duſt at *terra à terra*, when he does not take in ground enough with his ſhoulders, making his ſtrokes or motions too ſhort, as if he made them all in one place. He beats the duſt at curvets, when he does them too precipitantly and too low. He beats upon a walk, when he walks too ſhort, and thus rids but little ground, whether it be in ſtraight lines, rounds, or paſſages.

BEAT *upon the hand*, ſee CHACK.

BEAT *of the Drum*, in the *Military Art*, is differently performed, according to the purpoſes deſigned by it. Notice is hereby given of any ſudden change; ſoldiers are ſummoned to repair to their arms and quarters; and the various movements before and after, and during the engagement, are denoted by different beats of the drum.

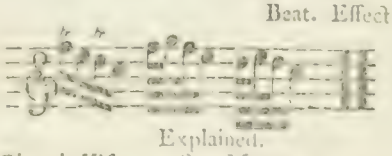
The chief beats or beatings on the drum are, the *general*, the *aſſembly*, the *chamade*, the *march*, the *reveille*, the *retreat*, &c. See DRUM.

BEAT, in *Muſic*, is a grace marked thus: " or thus ⁊. Its effect is juſt the contrary of a tranſient ſhake in rapid movements, where it can neither be prepared nor turned. It conſiſts merely of three notes:



Beat. Effect.

tranſient ſhakes:



Explained.

BEATA, in *Church Hiſtory*. See MASS *of the Beata*.

BEATA, *Cape*, is at the ſouth point of the iſland of St. Domingo or Hiſpaniola. N. lat. 17° 42'. W. long. 72° 2'.

BEATA *Iſland*, is about 14 leagues S.W. by W. from the cape.

BEATER is applied, in *Matters of Commerce*, to divers ſorts of workmen, whoſe buſineſs is to hammer or flatten certain matters, particularly metals. In this ſenſe we meet with *plaſter-beater*, *cement-beater*, *mortar-beater*, &c.

BEATERS, *gold*, are artiſans, who, by beating gold and ſilver with a hammer on a marble, in moulds of vellum and bullocks' guts, reduce them to thin leaves fit for gilding or ſilvering of copper, iron, ſteel, wood, &c.

Gold-beaters differ from flatters of gold and ſilver, as the former bring their metals into leaves by the hammer; whereas the latter only flatten it by preſſing it through a mill, preparatory to beating. See GOLD-*beating*.

There are alſo tin-beaters employed in the looking-glaſs trade, whoſe buſineſs it is to beat tin on large blocks of marble, till it be reduced to thin leaves, fit to be applied with quickſilver behind looking-glaſſes. See FOLIATING.

BEATER is alſo uſed for an inſtrument wherewith to gravel walks and alleys in gardens even. It is a piece of wood half a yard long, ſix inches thick, and eight or nine broad, having a handle fixed obliquely in the middle.

BEATIA, in *Ancient Geography*, a town of Spain, in Bætica, south-east of Castulo, and near it.

BEATIFIC VISION. See VISION.

BEATIFICATION, in *Electricity*, a term used by professor Boze to denote an electrical experiment, by which he incircled the head of a person strongly electrified, and standing on a large cake of pitch, with a luminous glory, resembling that with which painters ornament the heads of saints. The secret of this experiment, which occasioned many fruitless and expensive trials to the first electricians in Europe, consisted in the use of a suit of armour decked with steel, in various figures; and the glory was produced by rays issuing from the edges of the helmet.

BEATIFICATION, in the Romish *Church*, the act by which the pope declares a person happy after death.

Beatification differs from canonization; in the former, the pope does not act as a judge in determining the state of the beatified, but only grants a privilege to certain persons to honour him by a particular religious worship, without incurring the penalty of superstitious worshippers; but in canonization, the pope speaks as a judge, and determines "*ex cathedra*" upon the state of the canonized.

Beatification was introduced when it was thought proper to delay the canonization of saints, for the greater assurance of the truth and manifestation of the rigorous steps taken in the procedure.

The ceremony of beatification is a previous one to that of canonization; and cannot be performed till 50 years after the death of the person thus honoured. On this occasion, certificates or attestations of the character and miracles of the person for whom this honour is intended, are produced and examined by the congregation of rites. An advocate, called by the people the devil's advocate, is employed to contest the claims of the candidate; and it is the business of an advocate, engaged on the other side, to obviate and refute the cavils of the adversary. As soon as the saint's claim is confirmed, he is admitted into all the privileges of beatification by the pope's decree. His relics, if any such are found, become henceforth entitled to the veneration of all good Christians; his images are crowned with rays, and a particular office is set apart for him; and the day of his beatification is distinguished by the grant of indulgences and remission of sins.

It is remarkable, that particular orders of monks assume to themselves the power of beatification. Thus Octavia Melchiorica was beatified with extraordinary ceremonies by the Dominicans, for a legacy of 7000 dollars to the order.

BEATING, among *Sportsmen*, denotes the noise which hares make in *Rutting-time*.

The hare is said to *beat*, the hart to bell, &c.

BEATING, PULSATION, in *Medicine*, is applied to the reciprocal agitation or palpitation of the heart and pulse. See PULSATION.

BEATING *of the heart*. See PALPITATION.

BEATING *Flax*, or *Hemp*, is an operation in the dressing of these matters, contrived to render them more soft and pliant.

When hemp has been swingled a second time, and the hurds laid by, they take the strikes, and dividing them into dozens and half dozens, make them up into large thick rolls, which being broached on long strokes, are set in the chimney corner to dry; after which they lay them in a round trough made for the purpose, and there with beetles, beat them well, till they handle, both without and within, as pliant as possible, without any hardness or roughness to be felt: that done, they take them from the trough, open and divide the strikes as before, and if any be found not sufficiently beaten, they roll them up, and beat them over as before.

Beating hemp is a punishment inflicted on loose and disorderly persons.

BEATING, in *Book-Binding*, denotes the knocking a book in quires on a marble block, with a heavy broad-faced hammer, after folding, and before binding or stitching. On the beating of it properly, the elegance and excellence of the binding, and the easy opening of the book principally depend.

BEATING, in the *Paper Works*, signifies the beating of paper on a stone with a heavy hammer with a large smooth head and short handle, in order to render it more smooth and uniform, and fit for writing.

BEATING *the Wind*, was a practice in use in the ancient method of trial by combat. If either of the combatants did not appear in the field at the time appointed, the other was to beat the wind, or to make so many flourishes with his weapon; by which he was intitled to all the advantages of a conqueror. Du-Cange.

BEATING *the Hands or Feet*, by way of praise or approbation. See APPLAUSE.

BEATING *Time*, in *Music*. See BATTRE LA MESURE.

BEATING, in *Navigation*, the operation of making a progress at sea against the wind, in a zig-zag line or traverse, by steering alternately close-hauled on the larboard and starboard tacks. See TACKING.

BEATING, *Drubbing*, or *Stripes*, make one of the most ancient as well as universal species of punishment. Among the Romans it obtained, under the denomination of *verberare*, *fustigare*, *flagellare*, *pulsare*, &c. In the East it still prevails under the name of *bastonado*.

Some distinguish between *pulsation* and *verberation*, as if the latter imported a beating with pain, the former without; but this distinction is not always observed.

BEATING, in the English *Laws*. See BATTERY.

BEATING *in the Flanks*, a distemper to which black cattle are subject, and is an indication of a great inflammation in the bowels.

BEATING, in *Husbandry*. See BURNING *of Land*.

BEATITUDE, imports the supreme good, or the highest degree of happiness human nature is susceptible of.

In which sense, it amounts to the same with what we otherwise called *blessedness* and *sovereign felicity*; by the Greeks called εὐδαιμονία; and by the Latins *summum bonum*, *beatitudo*, and *beatitas*.

BEATITUDE, among *Divines*, denotes the beatific vision, or the fruition of God in a future life to all eternity.

BEATITUDE is also used in speaking of the *theses* contained in Christ's sermon on the mount, whereby he pronounces *blessed* the poor in spirit, those that mourn, the meek, &c.

BEATITUDE was also a title anciently given to all bishops; but of later days restrained to the pope.

It appears to have been sometimes also given to laymen.

BEATON, BETON, or BETHUNE, DAVID, in *Biography*, primate of Scotland, and cardinal of Rome, was descended from a family originally of France, and the nephew of archbishop James Beaton, his predecessor in the primacy. He was born in 1494; and having passed through the ordinary discipline of the schools, and of the university of St. Andrew's, he was sent to France by his uncle, for the completion of his education. In the university of Paris he applied with diligence to the study of the civil and canon laws, and also of divinity, in order to qualify himself for the service of the church. At the proper age, he entered into holy orders; but, notwithstanding his clerical character, he was

was employed in ſeveral affairs of importance by John duke of Albany, regent of Scotland, and appointed reſident at the court of France in 1519. In 1523 his uncle, being promoted to the archbiſhopric of St. Andrew's, reſigned the rich abbacy of Arbroath in his favour, and having obtained from the pope a diſpenſation for holding it two years without taking the habit, he returned to Scotland in 1525, and took his ſeat in parliament as abbot. Having ingratiated himſelf with the young king, whom he had ſerved in France during his minority, he was promoted in 1528 to the high office of lord privy-ſeal. In this capacity he obtained the king's confidence; and in 1533 he was entruſted with an important commiſſion which required his return to France, where he was eminently inſtrumental in maintaining the attachment of James to the French intereſt, and where he was employed in negociating ſeveral important concerns between the two courts, and in demanding for his maſter, Magdalen, the king's daughter, in marriage. During his ſtay at the French court, he gained the eſteem of king Francis I. to ſuch a degree, that he granted him ſeveral ſingular favours; inveſting him, in 1537, with all the privileges of a native of France, and conferring upon him, in the ſame year, the valuable biſhopric of Mirepoix. King James having eſpouſed the princeſs Magdalen at Paris in 1537, the abbot of Arbroath accompanied them to Scotland; and after her death, in the ſame year, he was deputed to negociate a ſecond marriage for the king with Mary, daughter of the duke of Guiſe, whom he conducted to Scotland in 1538, where their nuptials were celebrated at St. Andrew's. In this year he was advanced by pope Paul III. who wiſhed to attach the clergy of Scotland and England to the ſee of Rome, to the dignity of cardinal. Upon the death of his uncle ſoon after, he ſucceeded to the primacy, and exerciſed the ſingular powers with which he was inveſted in evincing his attachment to the religion and intereſts of Rome, in conducting a very ſevere inquiſition into heretical doctrines, and in cauſing proſecutions to be inſtituted againſt ſeveral perſons, of whom ſome were men of family and diſtinction. It is ſaid, that he had preſented to the king a roll of 360 of the chief nobility and barons, as ſuſpected of hereſy, and if the king's death had not prevented the execution of his ſanguinary purpoſes, theſe, and perhaps many more, muſt have fallen ſacrifices to his perſecuting power, which his majeſty did not ſeem diſpoſed to controul. At the inſtigation of the cardinal, James undertook the invaſion of England, and at Solway Moſs the royal army was totally defeated in 1542; but this unexpected diſaſter proved fatal to the king, and he died ſoon afterwards. The cardinal was the only perſon of authority who was preſent with him in his laſt moments; and he is accuſed of having forged a will, in which the king appointed him together with three other noblemen, to the regency of the kingdom, during the minority of queen Mary. This fact is conſidered as unqueſtionable by the generality of modern, as well as the more early hiſtorians. But the Engliſh intereſt prevailed, and the earl of Arran was declared to be regent. Upon this Cardinal Beaton was apprehended and confined; but in a little while, he contrived by his political ability and influence not only to be liberated, but to be appointed high-chancellor of the kingdom. The commiſſion of legate "à latere," which he ſoon afterwards obtained from the court of Rome, empowered him to proceed in his favourite deſign of extirpating heretics. In the execution of this deſign, he cauſed ſeveral perſons to be condemned and executed; and among the reſt, Mr. George Wiſhart, the moſt famous proteſtant preacher in Scotland, who was burnt at St. Andrew's in 1646; the cardinal himſelf, as it has been aſſerted on the authority of Buchanan, being ſeated at a window as a ſpectator of the tragedy. This execution produced great diſcontent and murmur amongſt the adherents of the proteſtant religion; and as the forms of law had not been duly regarded, they meditated a revenge. The cardinal, himſelf, however, apprehended no danger; and ſo prevalent was his intereſt at this time, that the earl of Crawford was gratified by marrying his eldeſt ſon to the cardinal's natural daughter; for notwithſtanding his profeſſion and high rank in the church, Beaton, without diſguiſe, kept a concubine, by whom he had ſeveral children. In leſs than three months after the death of Wiſhart, the event which this good man denounced, and as ſome have ſaid, without ſufficient reaſons, predicted, happened to the cardinal. A conſpiracy was formed againſt his life by ſome perſons whom he had diſobliged; and they, accompanied by a ſmall number of attendants, ſurpriſed the caſtle of St. Andrew's, in which the cardinal lodged, ruſhed into his chamber, and diſpatched him with their ſwords. One of the conſpirators, James Melville, expreſsly imputed his revenge to the cardinal's perſecution of Wiſhart. This event happened in the latter end of May 1646, and proved fatal to the ancient religion, and to the French intereſt in Scotland.

Beaton's character is ſufficiently marked in the hiſtory of his life. Poſſeſſed of talents, which qualified him for the high rank to which his ambition aſpired, and which he occupied both in the church and the ſtate, he eſpouſed and promoted the intereſt of Rome, as the moſt effectual method of ſecuring his advancement. Dr. Robertſon, indeed, aſcribes his ſupport of the Romiſh ſuperſtition, and his enmity to the reformers, merely to political motives; but there is reaſon to imagine, more eſpecially when we conſider the period in which he lived, that a real bigotry in favour of popery might blend itſelf with the principles and views of ambition and policy. It is certain, however, that his ambition was unbounded, that he was haughty and violent in his temper, that his inſolence was carried to the higheſt pitch, and that his character, upon the whole, was extremely deteſtable. His violence, as a perſecutor, muſt ever cauſe his memory to be held in abhorrence, by thoſe who have any feelings of humanity, or any regard for religious liberty. He appears to have had little learning, being prevented from acquiring it by his early and continued application to public buſineſs; and his morals were unbecoming his ſtation. Biog. Brit. Robertſon's Hiſt. of Scotland, vol. i. p. 97, &c.

BEATORUM, Insula, in *Ancient Geography*, a name given to one of the Oaſes (See Oasis) of Africa, called an *iſland*, becauſe it was ſurrounded with ſand, like an iſland in the ſea, and denominated "inſula Beatorum," becauſe, according to Strabo, it abounded with water, wine, and other neceſſaries of life, though encompaſſed by vaſt ſandy deſerts. Some have ſuppoſed that this Oaſis was a diſtrict of the "Oaſitæ nomi," about ſeven days journey weſt of Thebes. Others ſuppoſe that it was ſituated in the "Regio Ammoniaca," and that it was the ſite of the temple of Ammon, which was amply ſupplied with fountains and vegetation, and afforded a very pleaſant habitation. Ulpian ſays, that it was a place of baniſhment for real or pretended criminals, whence, as it was ſurrounded by ſand, there was no probability of eſcape.

BEATS, in *Horology*, are the audible ſtrokes which a tooth of the laſt wheel in a clock or watch movement makes againſt its pallet, to maintain the vibration of a pendulum, or oſcillation of a balance. The interval between two ſucceſſive beats, in a clock or watch with an ordinary eſcapement, is equal to one vibration or oſcillation, but is not exactly contemporary with it, becauſe the latter is counted as commencing at one of the extremities of its arc; where, as the former begins at ſuch other degree of it, as the

nature

nature of the eſcapement determines: a vibration here implies either one direct or one retrograde paſſage through the whole arc of a pendulum, and an oſcillation one direct or one retrograde motion of a balance through its whole arc. Hence, in a common clock or watch, the words beat, vibration, and oſcillation, are ſynonymous terms, when applied as the meaſure of the ſmalleſt ſubdiviſion of time; there being a ſtroke of the laſt wheel at ſome part of every vibration or oſcillation: but in thoſe aſtronomical and marine time-pieces which have detached eſcapements, there is but one beat in two vibrations or oſcillations, the alternate ſtroke of the piece which unlocks the detent being uſually ſilent; in theſe machines, therefore, the beats are ſlower by one half than in ordinary ones, notwithſtanding the movements, or mechaniſm of wheels and pinions, may be the ſame in both, and the vibrations or oſcillations ſimilar. In any horological machine, the number of vibrations or oſcillations which it makes in an hour, is the value of its train, which may be thus determined, viz. "Divide double the product of all the wheels, by the exact product of all the pinions, and the quotient will be the train univerſally;" the great wheel and its pinion, however, being uſed only to regulate the period of going after winding up, and to communicate motion, are left out of the calculation. The reaſon why the product of all the wheels is required to be *doubled*, is, that one tooth of the laſt wheel does not completely eſcape its pallet in leſs than two ſucceſſive vibrations or oſcillations in any eſcapement. The beats of a pocket watch are a very convenient meaſure of ſmall portions of time, and might be applied to many uſeful purpoſes with advantage, particularly if they were each an exact fraction, ſuch as $\frac{1}{4}$ or $\frac{1}{5}$ of the ſecond, which they might as eaſily be as otherwiſe. (Vid. Nicholſon's Journal, vol. iii. p. 49—and 189. and vol. v. p. 46, 4to. Series.) In the beſt time-pieces or chronometers for determining the longitude, this circumſtance is attended to, and the trains are uſually either 14,400 or 18,000, namely, either four or five oſcillations; i. e. either two, or two and a half beats per ſecond, by reaſon of their eſcapements being detached. If the ſame attention were paid to the trains of common pocket watches, the frequency of their beats would fit them for nice obſervations in ſome of the departments of philoſophy, and give them, in this reſpect, a preference even over more accurate inſtruments with leſs frequent beats: but at preſent, the only attention that is paid by the makers to the value of the train of a common watch is, that, for a ſmall balance, it may be a quick one, and for a large balance a ſlow one; or, in other words, that the momentum of the balance ſhall not be too much controlled by the maintaining power, which neceſſary proviſion might be equally attended to, if the beat were made an exact fractional portion of a ſecond. In any watch the whole train or vibrations in an hour divided by 3600, the ſeconds in an hour, will give the vibrations per ſecond of that watch. See Clock-Movement, Dead-Beat, Escapement, &c.

Beats, in *Muſic*, are certain pulſations of two continued ſounds, as in an organ, that are out of tune, occaſioned by warring vibrations that prevent coincidence in any two concords. This phenomenon, which was firſt diſcovered by M. Sauveur, has not only been deſcribed by Dr. Smith in his "Harmonics" but made the foundation of a ſyſtem of temperament. "In tuning muſical inſtruments, (ſays he, Sect. IV. Prop. X.) eſpecially organs, it is a known thing, that while a conſonance is imperfect, it is not ſmooth and uniform as when perfect, but interrupted with very ſenſible undulations or *beats*; which, while the two ſounds continue at the ſame pitch, ſucceed one another in equal times, and in longer and longer times, while either of the ſounds approaches gradually to a perfect conſonance with the other; till at laſt the undulations vaniſh, and have a ſmooth, uniform, conſonance."

Theſe beats, the ſame author obſerves, are of uſe in tuning an organ to any deſired degree of exactneſs.

The work of Dr. Smith, though excellent, is far too profound for the perſons moſt in want of it: the organ and harpſichord tuners are ſeldom mathematicians; and to comprehend the doctrines laid down in this book, would require as much ſcience as Newton's "Principia".

The beats of two diſſonant organ pipes, reſemble the beating of the pulſe to the touch: and, like the human pulſe in a fever, the more diſſonant are the ſounds, the quicker they beat, and the ſlower as they become better in tune; till at length they are loſt in the coincident vibrations of the two ſounds. See Vibration, Temperament, and Tuning.

BEATTIE, James, L. L. D., in *Biography*, a celebrated moral philoſopher and poet, was born Nov. 5, 1735, in the county of Kincardine, in North-Britain. His father was in a ſtation of life no higher than that of a little farmer, a claſs of men ſubject to much hardſhip and indigence in Scotland. He was, however, poſſeſſed with that laudable ſpirit which ſo frequently in that country raiſes native genius from obſcurity; and he beſtowed upon his ſon a literary education, firſt in the parochial ſchool of his neighbourhood, and then in the college of New Aberdeen. The youth was aſſiſted in his progreſs through the ſtudies of the latter, by the liberality of a brother, (his father having died when he was 7 years of age,) and by one of thoſe ſmall exhibitions which have been annexed to it for the encouragement of learning; and it is ſuppoſed that he ſupported himſelf in the intervals of the ſeſſions by teaching at a country ſchool. For ſome conſiderable portion of his early life, it is known that he acted as a ſchoolmaſter, in Kincardineſhire. At length he removed to Aberdeen, and engaged as aſſiſtant to the maſter of the principal grammar-ſchool, whoſe daughter he married.

The talent which firſt made him known to the world was that of poetry, which he had cultivated from his youth. In 1761, he publiſhed a volume of "Original Poems and Tranſlations," which in 1765 was followed by "The Judgment of Paris." Theſe performances were characteriſed by richneſs and elegance of language and melody of verſification; but rather denoted a refined taſte in poetry, than a powerful and inventive genius. They probably brought the author into notice at the place of his reſidence, but ſeem to have excited little attention among readers in general.

One of the fruits of his riſing reputation was to obtain for him the patronage of the earl of Errol, who reſided in the neighbourhood of Aberdeen. Beſides other benefits, the influence of this nobleman acquired for Mr. Beattie the honourable ſituation of profeſſor of moral philoſophy and logic in the mariſchal college of Aberdeen. In this capacity he next appeared before the public as the author of a philoſophical work, entitled "An Eſſay on the Nature and Immutability of Truth, in Oppoſition to Sophiſtry and Scepticiſm," 8vo. 1760. The progreſs made about this time by Mr. Hume's principles, eſpecially among his countrymen, could not fail of exciting alarm among the friends of revealed religion. How long Beattie had ranked among theſe, does not clearly appear. An admired poem of his, "The Hermit," in its firſt form ſtrongly expreſſes that doubt of a future exiſtence which could not be baniſhed from heathen philoſophy; and in a poem hereafter to be mentioned, he warmly congratulates himſelf on having *eſcaped* "From Pyrrho's maze and Epicurus' ſty." There is a vein of acrimony and exaſperation in all his alluſions to the ſceptical philoſophy, which renders not improbable the report of a perſonal offence received by him from Hume; though there is

no reason to doubt that when he wrote his book, he was very sincerely impressed with the danger of the tenets he opposed, and that he ever after remained zealously attached to the cause of revelation. The author in this work is regarded as a philosophical disciple of Dr. Reid, admitting an instinctive principle of the perception of truth, and founding it upon that faculty of *common sense*, which acts in a similar manner upon all, or a great majority, of mankind. As he wrote with more eloquence and a more popular manner than Dr. Reid, his performance was much read, and gained him a number of very respectable friends and admirers. It is allowed, that he has successfully detected many of the sophisms of Hume, and has brought together many ingenious and useful thoughts on this subject; but the foundation of its philosophy has by some, especially by Dr. Priestley, been treated as shallow and superficial: and he has been censured for the arrogance which he has displayed towards those of opposite opinions, and for the readiness with which he has imputed to them consequences subversive of morality. Indeed, many parts of his book favour more of the rhetorician than the philosopher. These defects, however, did not render less acceptable an attempt from a layman to serve the cause of religion; and among the friends Beattie acquired on the occasion, were lords Mansfield and Lyttelton, bishops Hurd and Porteus, Dr. Johnson, and Mrs. Montague. The influence of lord Mansfield obtained for him a pension of 200l. from his majesty's privy-purse.

In the year 1771, his fame as a poet was extended throughout the kingdom by the publication of the first part of "The Minstrel." The subject of this piece, is the feigned birth and education of a poet. The term *minstrel* is not very happily applied to the character described; nor are the famed "Gothic days" in which he is placed to be recognized in real history: but there is great beauty in the delineation of the native poetical disposition assigned to him, and in the invention of circumstances by which it is nourished. The stanza is that of Spenser, which is managed with singular dexterity, and made to produce a melody of versification scarcely exceeded in the range of English poetry. The second part of this poem, which appeared in 1774, contains the maturer education of the young bard, and enlightens his mind with the lessons of history, philosophy, and science. There are many fine strains in this part, which, however, deviates from the original conception; and the work is left a fragment, probably because its plan was found to involve unavoidable incongruities. The "Minstrel," whatever be its defects, is probably the performance on which Beattie's future fame will chiefly depend; and it may be regarded as having taken secure possession of a place amid the most approved poetry in the language.

Mr. Beattie visited London in 1771, and was received with great cordiality by his admirers. The degree of L.L.D. was conferred upon him by his college at Aberdeen in 1770, and he repeated his London journey in 1773, in consequence of which he obtained the pension above mentioned. A new edition in 4to. of the "Essay on Truth," was published in 1776, by a private subscription among his friends, conducted on the most liberal principles, and to the volume were added three essays on subjects appertaining to polite literature, which had been read before a private society at Aberdeen. In the Essay on Truth, some corrections were made, and some harsh reflections were softened and modified. The other pieces displayed much refined taste, sound judgment, and acquaintance with the best authors, ancient and modern.

Dr. Beattie, in 1783, published a quarto volume consisting of "Dissertations, Moral and Critical." These are detached essays on various subjects, which formed a part of a course of lectures read by the author in his professional capacity. Many useful and curious topics are discussed in them, without any pretensions to extraordinary subtlety and acuteness, but in a mode calculated to improve the heart as well as the understanding. The work is not free from somewhat of the warm and dogmatical manner which characterises the Essay on Truth; and though not unworthy of the writer's fame, it appears to have made little addition to it. The applause given by the bishop of London to a sketch of manuscript lectures to young persons on the evidence of Christianity, induced Dr. Beattie to draw up and publish, in 1786, a work entitled "Evidences of the Christian Religion, briefly and plainly stated," 2 vols. 8vo. This was esteemed a plain, elegant, and popular view of the subject well calculated for its intended purpose. In 1790 he published a summary of his lectures under the title of "Elements of Moral Science." The first volume contains a very accurate examination and arrangement of the perceptive faculties and active powers of man. He has also given a cursory view of what is called Natural Theology. The second volume, published in 1793, comprehends much miscellaneous information in ethics, economics, politics, and logic, including rhetoric, towards the latter part of his life. It was the last publication of the author, whose time was much occupied with the duties of his station, and with social and domestic concerns; of which one of the dearest to his heart was the education of his eldest son, James Hay Beattie, a youth of very extraordinary endowments and uncommon moral excellence. He was so successfully trained by his father, as to be made his assistant in the professorial chair at the age of nineteen; and he was become the most intimate friend and beloved companion of his revered parent, when he fell into a decline, which carried him off in 1790, at the age of 22. Dr. Beattie had fortitude enough to be the editor of a small volume of the youth's compositions, in verse and prose, to which he prefixed a memoir on his life and character, highly interesting and unaffectedly pathetic. This grievous loss was followed in 1796 by that of his younger son, Montague Beattie, in his eighteenth year. The unhappy father was unable, with all his resources, to bear up under this accumulated sorrow. The latter years of his life were a blank of existence, which terminated at Aberdeen, on August 18, 1803, in the 68th year of his age. Dr. Beattie was amiable and exemplary in every department of private life, and fulfilled the duties of his public station in such a manner as to confer honour and credit upon the university of which he was a professor. He was a fellow of the Royal Society of Edinburgh.

BEATUS RHENANUS, a learned man of the 16th century, whose father, Anthony Bilde, assumed the name of Rhenanus from Rheinach, the place of his birth, was born at Schlettstad in Alsace, in 1485. He pursued his studies at Paris and Strasburg, and from thence proceeded to Basil, where, in 1514, he formed an intimate acquaintance with Erasmus, and applied to the Greek language under J. Conon of Nuremberg, and became a corrector of the press to the celebrated Frobenius. At the age of 35 he returned to Schlettstad. He first published the two books of the "History of Velleius Paterculus," and first cursed the works of Tertullian to be printed from two MSS. which he borrowed from two monasteries in Germany. His notes to Tertullian were censured by the Spanish inquisition, and placed in the Index of prohibited books, because they contained some free reflections on the sensuality of the clergy in his time. Rhenanus was a man of extensive learning, particularly in the Greek language, church history, and the antiquities of Germany. Scaliger says, that he contributed greatly

greatly to revive ancient literature, and Scioppius bears very honourable teſtimony to his talents as a critic. Towards the cloſe of his life he was afflicted with a diabetes, and obtaining no relief from the baths of Baden in Swiſſerland, he died at Straſburg in 1547. He was no leſs diſtinguiſhed by his integrity and modeſty, and his mild and conciliating temper, than by his great learning. He profeſſed great regard for Luther, and deteſted the tyranny which the clergy exerciſed at that period; but he never openly declared in favour either of Luther or of any other reformer. Although he was no leſs diſpleaſed than Eraſmus with the errors that had blended themſelves with religion, he was an enemy to ſchiſm, and wiſhed, by prudent reformation, to preſerve the unity of the Chriſtian church. Of his works, written in Latin, which were numerous, we ſhall only mention his "Obſervations on Pliny's Natural Hiſtory," his "Notes on Livy," his "Preface and Annotations to Tacitus," his "Epiſtle prefixed to Eraſmus's edition of the Works of Origen," his "Preface to the Works of Eraſmus, and his "Origines Gothicæ:" to which we may add his beſt work, entitled "De rebus Germaniæ libri tres," printed at Ulm in 1693, with the annotations of James Otto. Jortin's Life of Eraſmus. Gen. Biog.

BEAU, Charles Le, was born at Paris in 1701, and became profeſſor of rhetoric in the college des Graſſins, then profeſſor in the college-royal, ſecretary to the duke of Orleans, and perpetual ſecretary and penſionary of the academy of inſcriptions. Like Rollin, he united the charms of eloquence with profound erudition, and was no leſs, than this eminent profeſſor, beloved by his pupils. His moſt conſiderable work was his "Hiſtory of the Lower Empire," in French, 22 vols. 12mo., which is written in a correct and elegant ſtyle. He alſo wrote ſeveral learned diſſertations in the "Memoirs of the Academy of Belles Lettres," and ſome "Hiſtorical Eulogies," on the academicians. His private character was amiable, and he was much eſteemed for his worth and generoſity. He died at Paris in 1778. His younger brother, John Lewis Le Beau, was profeſſor of rhetoric in the college des Graſſins, and member of the academy. He publiſhed a diſcourſe on the condition of fortune moſt ſuitable to a man of letters; and an edition of "Homer, Greek and Latin," 2 vols. 1746, and of "Cicero's Orations," 3 vols. 1750; both with notes. Nouv. Dict. Hiſt.

Beau *Port*, in *Geography*, a ſpacious and commodious harbour on the S. E. part of the Falkland iſlands, capable of accommodating a large fleet of ſhips in perfect ſafety. It is almoſt ſurrounded by the land, has good anchorage, and ſufficient depth of water.

BEAUBASSIN Bay. See Chignecto.

Beaubassin *Bay*, is alſo a bay on the ſouth coaſt of the ſtrait of Maghellan, at the S. E. angle of the ſtrait, where it extends to the W. It is nearly oppoſite to Wallis's harbour on the north coaſt, is a ſpacious bay, and has an open entrance.

BEAUCAIRE, a town of France, and chief place of a canton in the diſtrict of Nimes and the department of the Gard, on the right bank of the Rhone, oppoſite to Taraſcon, with which it has a communication by a bridge of boats. This town carries on a conſiderable commerce in wool, ſilk, ſtuffs, ſpices, drugs, leather, cotton, &c.; and it has an annual fair which laſts for ſix days. The part of the Rhine is well conſtructed. The principal building is the collegiate church. The place contains 7943 and the canton 16,853 inhabitants: the territory includes 162 kiliometres and 4 communes. N. lat. 43° 48′. E. long. 4° 30′.

Beaucaire de Peguilon, Francis, in *Biography*, a polite ſcholar of the ſixteenth century, was deſcended from an ancient family of the Bourbonnois, and born in 1514. In conſequence of his literary reputation, he was appointed preceptor to cardinal Lorrain, the ſecond ſon of the firſt duke of Guiſe, and attended him to Rome. On his return, he was promoted to the biſhopric of Metz, and attended his patron to the council of Trent, where he diſtinguiſhed himſelf by his eloquence. He was likewiſe of ſingular ſervice in reſcuing the fathers of the council from the perplexity occaſioned by different opinions concerning marriage; for he drew up a decree, framed in terms ſo ambiguous as to be accommodated to the variety of opinions that were held, and by the different ſenſes in which it might be interpreted to ſatisfy all parties. However, he gave offence to the votaries of the papal power by maintaining the independence of the epiſcopal order, and his opinion on this point was diſavowed by the cardinal of Lorrain. In 1568 he reſigned his biſhopric to Lewis, cardinal of Lorrain, and retired to his caſtle of La Chrete in the Bourbonnois. Here he employed himſelf in compoſing a "Hiſtory of his own Times," which was written in Latin, and compriſed the events from the year 1462 to 1567. This work was diſcontinued about three years before his death, which happened in 1591. It remained in MS. for ſeveral years, the author having declined the publication of it for fear of giving offence; but being found in his library by Philip Dinet, he printed it at Lyons in 1625, in folio. It is deemed a well-written, and upon the whole, a faithful hiſtory; though too favourable to the houſe of Guiſe, and very hoſtile to the Hugonot party. Beaucaire, ſome time after he had taken poſſeſſion of his ſee, engaged in a controverſy with the Calviniſts upon the future ſtate of children dying unborn. Gen. Dict.

BEAUCE, or Beausse, in *Geography*, the name given before the revolution to a country of France, part of Orleannois, now the department of Eure and Loire, which was ſo fertile in every part, as to be called the granary of France. Its capital was Chartres.

BEAUCHENES Island, a ſmall iſland to the S. of Falkland iſlands, in S. lat. 53°, and W. long. about 58° 30′.

BEAUCHASTEL, a town of France, in the department of the Ardeche, 2½ leagues S.S.W. of Valence.

BEAUCHIEF Abbey, was ſituated in a pleaſant valley, on the north ſide of Derbyſhire, in England, within a ſhort diſtance of the town of Sheffield. This celebrated religious houſe was founded by Robert Fitz-Ranulph, lord of Alfreton, between the years 1172 and 1176, for regular canons of the premonſtratenſian order. Since the diſſolution of monaſteries, 26th of Henry VIII. this abbey has continued to crumble by the decay of time, and only a part of the chapel remains to mark the character of this once proud pile. See Pegg's Hiſtory of Beauchief Abbey, 4to.

BEAUDUN, a town of France, in the department of the Var, and chief place of a canton, in the diſtrict of Barjols; 12 miles N. E. from Barjols.

BEAVER, in *Zoology*, the Engliſh name of Castor Fiber, *Linnæus*, which ſee. Pennant calls Sorex Moschatus of *Pallas*, the *Long noſed beaver*.

Beaver, Bever, and in Latin *Fiber*, *Caſtor* & *Caſtorius*, John, in *Biography*, a benedictine monk, in Weſtminſter Abbey, flouriſhed about the beginning of the 14th century. He is repreſented as a perſon of ingenuity and induſtry, and a great maſter of the hiſtory and antiquities of England, to the ſtudy of which he particularly devoted himſelf. He wrote, "a Chronicle of the Britiſh and Engliſh Affairs," from the coming in of Brute to his own time, which remains in MS. in the Cottonian library; and alſo a book "De Rebus

Cœnobii Weſtmoranienſis." He is commended by Leland and Bale, and cited with reſpect by Stow in his Survey of London and Weſtmiſter. Biog. Brit.

Beaver, *Creek*, in *Geography*, a creek of North America, which runs into lake Erie, at the eaſt end about 7 miles S. E. from Fort Erie.

Beaver *Creek, Big*, falls into the Allegany river, after having received ſeveral branches from the north-eaſt, about 28 miles N. W. from Pittſburg. It riſes in the ſouth, runs north about 6 miles, thence 12 more north-eaſt to the Salt Lick town; then by the Mahoning town and Salt Springs, 34 miles ſouth-eaſterly to the Kiſh-kuſh town, from which to its mouth are 22 miles ſoutherly. Its whole courſe is about 74 miles.

Beaver *Dam*, a townſhip in Pennſylvania, on the weſt ſide of Suſquehannah river.

Beaver *Eater*, in *Zoology*. See Glutton.

Beaver *Iſland*, in *Geography*, an iſland in the lake Michigan. N. lat. 45° 26′. W. long. 85° 20′.

Beaver *Indians*, nations of North America, ſituate north of Slave lake, in N. lat. about 62°, and W. long. about 120°.

Beaver *Kill*, is a ſouth-eaſt arm of the Popachton branch of the Delaware. Its mouth is 17½ miles eaſt from the Cook Houſe, and 24½ N. W. from Kuſhichtun Falls.

Beaver *Lake*, a lake of North America, forming a part of the Saſkathawin river, in N. lat. 54° 40′. W. long. 102° 50′. To the north of it at a little diſtance is the ſource of Churchill river; to the ſouth is Cumberland-houſe; and not far from it are a number of houſes belonging to the Hudſon's bay company.

Beaver *River*, a river of North America, which riſes in a lake called Beaver lake and the adjoining hills, in about N. lat. 54° 40′. W. long. 111° 15′, and diſcharges itſelf into la Cros lake, in N. lat. 55° 15′. and W. long. 108° 30′.

Beaver-rat, in *Zoology*. See Mus Coypus.

Beaver *ſkin*, the fur or ſkin of an amphibious animal called the *caſtor*, or *beaver*, ſometimes found in France, Germany, and Poland, but moſt abundantly in the province of Canada in North America, and the uninhabited wilds of Siberia. The ſkin of the beaver has hair of two kinds: the lower hairs immediately next to the ſkin are ſhort, implicated together, and as fine as down; the upper grow more ſparingly, and are thicker and longer. The latter is of little value; but the ſlix or down is wrought into hats, ſtockings, and caps.

——"The beaver's ſlix
Gives kindlieſt warmth to weak enervate limbs,
When the pale blood ſlow riſes through the veins."
Dyer's Fleece.

The merchants diſtinguiſh three kinds of caſtor, though all equally the ſkins of the ſame animal; theſe are *new caſtor*, *dry caſtor*, and *fat caſtor*. The *new caſtor*, called alſo *winter caſtor*, and *Muſcovite caſtor*, becauſe ordinarily referred to ſend into Muſcovy, is that taken in the winter huntings. This is the beſt, and moſt eſteemed for rich furs, as having loſt none of its hair by moulting. In the year 1794 the importation of beaver ſkins into the port of St. Peterſburg amounted to the value of 332,350 rubles; a circumſtance, which, as Mr. Tooke obſerves, ought to be a matter of concern to every true Ruſſian, as it naturally ſtrikes us with ſurpriſe, that a country ſo richly ſtocked with wild animals of every kind ſhould be dependant on foreign induſtry in this claſs of its neceſſaries. *Dry caſtor*, or *lean caſtor*, is the reſult of the ſummer huntings, when the beaſt is moulted, and has loſt part of its hair; this being much inferior to the former, is little uſed in furs, but moſtly in hats. *Fat caſtor*, uſually called *old-coat*, or coat-*beaver*, is that which has contracted a certain fat, unctuous humour, by ſweat exhaled from the bodies of the ſavages, who have worn it for ſome time; this, though better than the dry, is yet only uſed for hats.

Its chief uſe is in the compoſition of hats, furs, &c. Beſides this, in 1669, an attempt was made to employ it in other merchandizes; accordingly, a manufactory was ſettled in the Fauxbourg S. Antoine near Paris, where they made cloths, flannels, ſtockings, &c. of *caſtor*, with a mixture of wool. The manufacture flouriſhed for a while, but ſoon decayed, it being found by experience that the ſtuffs loſt their dye when wet, and that when dry again they were harſh and ſtiff as felts.

After the hair is cut off the ſkin to be uſed in hats, the pelt or ſkin itſelf is uſed in various works, *viz.* for the covering of mails and trunks, in ſlippers, &c.

Beaver is chiefly imported by the Hudſon's-bay company, from the northern parts of America, where the animal abounds. Beaver ſkins are alſo procured in conſiderable abundance on the weſtern coaſt of North America. See Fur.

Beaver's *Town*, in *Geography*, lies between Margaret's creek, an upper N. W. branch of Muſkingum river, and the north branch of that river; at the head of which north branch there is only a mile's portage to Cayahoga river. Beaver's town is diſtant about 85 miles N. W. from Pittſburg.

BEAUFET. See Buffet.

BEAUFORT, Henry, in *Biography*, cardinal and biſhop of Wincheſter, was the natural ſon, legitimated by parliament, of John of Gaunt, by Catherine Swineford, who afterwards became his third wife. Having been educated at Oxford and Aix la Chapelle, he was advanced, at an early period of his life, to high ſtations both in the church and the ſtate. In 1397 he became biſhop of Lincoln, in 1399 chancellor of the univerſity of Oxford, and dean of Wells, in 1404 lord high chancellor of England, and in 1405 biſhop of Wincheſter. During the reigns of his brother, Henry IV., and of his nephew, Henry V., he does not ſeem to have poſſeſſed much political importance: but he lived in great ſplendour, and acquired immenſe wealth, ſo that he was able to lend Henry V. 20,000l. to aid his expedition into France, and thus to divert him from his deſign of attacking the revenues of the church. Upon the death of Henry V. he was appointed one of the guardians of his ſon Henry VI. during his minority; and in 1424 he was again made lord chancellor of England. In 1425, the diſſenſions that ſubſiſted between him and the protector, Humphry duke of Glouceſter, roſe to ſuch a height, that Beaufort thought it neceſſary to appeal to his nephew, the duke of Bedford, then regent of France, and to requeſt his preſence for bringing about an accommodation. Upon the arrival of the regent an aſſembly of the nobility was convened at St. Alban's; but their interpoſition proving ineffectual, the deciſion of the conteſt was referred to the parliament held at Leiceſter in 1426. The duke of Glouceſter produced ſix articles of accuſation againſt the biſhop, of which he was acquitted; and the diſputants being enjoined to cultivate mutual friendſhip, departed with outward appearances of perfect amity. The regent, however, in order to gratify his brother, the protector, took away the great ſeal from the biſhop. In 1428 the duke of Bedford returned to France, and was accompanied by Beaufort to Calais, where he was inveſted with the dignity of cardinal, with the title of St. Euſebius, conferred upon him by pope Martin V. He was alſo honoured by the ſame pope with the character of legate; but on his return to England, he was forbidden the exerciſe of it by royal proclamation. As he was likewiſe appointed the pope's legate in Germany, and general of the cruſade againſt the Huſſites, or hereties of Bohemia, he obtained from parliament the grant of a ſum of money, and a body of forces, for the more ſucceſsful execution,

cution of his office. Having embarked with his troops for France, he was obliged, for some time, with reluctance on his own part, to employ them under the duke of Bedford; and he then proceeded with them to Bohemia, where he remained for some months, till he was recalled by the pope. In 1430 he accompanied king Henry into France, under the title of the king's "principal counsellor," and performed the ceremony of crowning the young monarch in the church of Notre Dame, at Paris. The honours, however, which he received during his absence, were, in his estimation, an inadequate compensation for the mortification resulting from the duke of Gloucester's successful attempts for humbling his pride, and restraining his power. He not only procured an order of council, prohibiting any of the king's subjects from accompanying the cardinal, if he should leave the king without his permission; but he attempted to deprive him of his bishopric, as inconsistent with the dignity of a cardinal. On his return, and for his more effectual security against these hostile attempts, he obtained, by the intercession of the house of commons, letters of pardon for all offences committed by him contrary to the statute of "provisors," and other acts of "præmunire." This pardon was renewed five years after, viz. in 1437, for all crimes whatsoever. Notwithstanding these precautions, the duke of Gloucester, in 1442, drew up fourteen articles of impeachment against him, and presented them with his own hands to the king, who referred the matter to his council. The examination of these articles was attended with such delay, that the protector dropped the prosecution, and the cardinal escaped. The cause of the protector's inveterate enmity against the cardinal is said to have been the part which he had taken in instigating certain persons to accuse and persecute his duchess for treason, witchcraft, and other notorious crimes.

Cardinal Beaufort died in 1447, about a month after the duke of Gloucester, in whose murder, it is supposed, he was concerned. The remorse and horror occasioned by the reflection on this event, in the near approaches of his own death, were "more," says Hume, "than could naturally be expected from a man hardened, during the course of a long life, in falsehood and politics;" and they are exhibited in very impressive characters in the representation of his last scene by Shakespeare, in the last scene of the third act of the "Second Part of King Henry VI."

"If thou be'est death, I'll give thee England's treasure,
Enough to purchase such another island,
So thou wilt let me live, and feel no pain."

Again,

"Bring me unto my trial when you will.
Dy'd he not in his bed? where should he die?
Can I make men live, whether they will or no?
Oh! torture me no more: I will confess——
Alive again? Then, shew me where he is;
I'll give a thousand pounds to look upon him—
He hath no eyes, the dust hath blinded them:
Comb down his hair; look! look! it stands upright,
Like lime-twigs set to catch my winged soul.
Give me some drink, and bid th' apothecary
Bring the strong poison that I bought of him."

The cardinal was buried at Winchester. He died rich, and left large sums for pious and charitable purposes, in various parts of the kingdom; and he ordered 10,000 masses to be said for his soul. Haughty and turbulent, and fond of pomp and power, he is allowed to have been a faithful and able servant of the crown. Mr. Hume describes him as a prelate of great capacity and experience, but of an intriguing and dangerous character. Hume's Hist. vol. iii. p. 135. 173. Biog. Brit.

Beaufort, Margaret, distinguished by her munificent encouragement of literature, was the daughter of John Beaufort, duke of Somerset and grandson of John of Gaunt; she was born at Bletshoe, in Bedfordshire, in 1441. Her first husband was Edmund earl of Richmond, by whom she had one son, Henry VII. king of England. Her second husband was Sir Henry Stafford, second son of Henry duke of Buckingham; and her third, Thomas lord Stanley, afterwards earl of Derby, by neither of whom she had any issue. Waving all pretensions to the crown in favour of her son, she devoted her life to exercises of piety and charity, and derived her chief pleasure from relieving the indigent and distressed. She kept constantly in her house twelve poor people, whom she lodged, fed, and clothed. She extended her patronage to the students of both universities, and to men of learning throughout England. In 1502 she instituted two perpetual public lectures in divinity, one at Oxford, and the other at Cambridge, which still subsist under the name of Margaret professorships. At Cambridge she established a perpetual public preacher, whose duty it should be to preach, at least, six sermons every year, at certain churches in the dioceses of London, Ely, and Lincoln; and she also founded a perpetual chantry at Winbourn minster, in Dorsetshire, for teaching grammar. But her noblest institutions were the colleges of Christ and St. John in Cambridge, the former founded in 1505, for one master, twelve fellows, and forty-seven scholars, and the latter in 1508, for a master and fifty fellows and scholars, which being begun just before her death, was finished by her executors. It is, therefore, with justice, that Gray has made this lady the principal object of his eulogy, in his ode on the installation of the duke of Grafton as chancellor of Cambridge.

"Foremost, and leaning from her golden cloud,
"The venerable Margaret see!
"Welcome, my noble son," she cries aloud,
"To this, thy kindred train, and me:
"Pleased in thy lineaments we trace
"A Tudor's fire, and a Beaufort's grace."

Her piety and devotion were no less exemplary, though partaking in a great degree of the superstition of the times, than her charity. She died in June 1509, and was interred in the chapel of her son Henry VII. in Westminster Abbey. She is the reputed author of the translation of two devotional pieces from the French, and also of rules and orders for the prudence and attire of noble ladies at funerals. Biog. Brit.

Beaufort, in *Geography*, a town of France, in the department of the Mayne and Loire, and chief place of a canton, in the district of Baugé. The place contains 5990 and the canton 15,125 inhabitants; the territory comprehends 200 kiliometres and 7 communes. The castle of Beaufort gives the title of duke to the noble family of Somerset, lineally descended from John of Gaunt, duke of Lancaster, and the house of Lancaster obtained this castle from Blanche of Artois, queen of Navarre, wife to Edmund Crouchback, second son of king Henry III., and first earl of Lancaster. N. lat. 47° 26′. W. long. 0° 3′.

Beaufort, a town of France in the department of the Drome, 2 leagues N. E. of Crest.

Beaufort, a town of Italy in Savoy, on the river Oron, 30 miles E. N. E. of Chambery. By the late French arrangement, this is the chief place of a canton in the department of Mont Blanc, and district of Moutiers. The place contains 3070 and the canton 7357 inhabitants: the territory includes 182½ kiliometres and 4 communes. N. lat. 45° 40′. E. long. 6° 48′.

Beaufort, a district of the lower country of South Carolina, lying on the sea-coast, between Combahee and Savannah rivers. It is 69 miles long and 37 broad, and divided into four parishes, containing 18,753 inhabitants, of whom only

only 4346 are whites. The northern part of this diſtrict abounds with large foreſts of cypreſs; but the lands are fit for raiſing rice, indigo, &c. It ſends twelve repreſentatives and four ſenators to the legiſlature of the ſtate. The amount of taxes is, 3,022l. 2s. 11d. ſterling.

Beaufort is the chief town of the above-mentioned diſtrict, ſituated in the iſland of Port Royal, at the mouth of Coſſawhatchie river. It is a pleaſant though ſmall town, having ſixty houſes, and about 200 inhabitants, diſtinguiſhed by their hoſpitality and politeneſs. It has a fine harbour, and is likely to become a conſiderable town. Its ſituation is healthy, and it is diſtant about 73 miles S. W. from Charleſton. N. lat. 32° 26′. W. long. 80° 55′.

Beaufort, a ſea-port town of North Carolina, in the county of Carteret, and diſtrict of Newbern, on the N. E. ſide of Core ſound. It contains about 20 houſes, a court-houſe, and gaol; and the county-courts are held here. It is diſtant 55 miles S. E. from Newbern, and about 27 from Cape Lookout. N. lat. 34° 47′. W. long. 77° 20.

Beaufort Iſland. See Port-Royal.

BEAUGENCY, or Baugency, a town of France, and chief place of a canton in the diſtrict of Orleans and the department of the Loiret, ſeated on the Loire, over which is a bridge of 22 arches, and trading in wine and brandy; 4½ leagues S. W. from Orleans. The place contains 4842 and the canton 11,784 inhabitants on a territory of 140 kiliometres, including 7 communes. N. lat. 47° 48′. E. long. 1° 46′.

BEAUJEU, a town of France, in the department of the Rhone, and chief place of a canton in the diſtrict of Villefranche, ſituated at the foot of a mountain on the Ardiere, formerly the capital of the Beaujolois; 4 leagues N. N. W. of Villefranche, and 7 E. N. E. of Roanne. The place contains 1600, and the canton 12,867 inhabitants, on a territory of 252½ kiliometres including 11 communes. N. lat. 46° 10. E. long. 4° 40′.

BEAUJOLOIS, a ſmall but fertile province of France before the revolution, now forming part of the department of Ifère, 10 leagues long, and 8 wide, ſituated between the Lyonnois, Burgundy, the Saone, and Loire.

BEAULIEU, a pleaſant village in the New Foreſt, Hampſhire, is diſtinguiſhed in the monaſtic hiſtory of England, for a large abbey, which was founded and endowed here by king John, in 1204, for monks of the Ciſtercian order. The remains of this abbey are now conſiderable; and the walls, which formerly incloſed an area of nearly twenty acres, are mostly ſtanding. The abbot's houſe, now called the Palace, has been fitted up and much modernized by the predeceſſor of the late duke of Montague. This abbey poſſeſſed the privilege of *ſanctuary*, and conſequently gave reception and protection to many villains and felons. Among others Perkin Warbeck, in the year 1498, having raiſed the ſiege of Exeter, and retired with his army to Taunton, fled by night to this monaſtery, where he and ſeveral of his companions regiſtered themſelves ſanctuary-men. Henry VII. was prevailed on from ſeizing him by force, but offered his life, if he would ſurrender himſelf. This he complied with, and was brought to London, where he was confined in the Tower, and afterwards hung at Tyburn for ſeditious practices. Rapin's England, vol. i. Tour round Southampton, 12mo.

Beaulieu, a town of France, in the department of the Correze, and chief place of a canton in the diſtrict of Brive, on the Dordogne, 17 miles ſouth-eaſt of Brive. The place contains 1937 and the canton 9660 inhabitants; the territory includes 132½ kiliometres and 14 communes.—Alſo, a town of France, in the department of the Indre and Loire, ſeated on the Indre, oppoſite Loches, and containing about 1500 inhabitants.—Alſo, a town of France, in the department of the Loiret, 4 leagues S. E. of Gien.

Beaulieu *ſous la Roche*, a town of France, in the department of the Vendée, and chief place of a canton in the diſtrict of Sables d'Olonne, 4½ leagues N. N. E. of Sables d'Olonne.

BEAULON, a town of France, in the department of the Ill and Vilaine, and chief place of a canton in the diſtrict of Redon, 4 leagues S. W. of Rennes.

BEAULY, is the name of a river in Inverneſsſhire, Scotland. It is formed by the junction of three ſmall ſtreams, which concentrate near Erkleſs caſtle, whence the united waters flow eaſterly, and after forming the falls of Kilmorack and other fine caſcades, they are diſcharged into an arm of the ſea. The frith, or mouth of the river, is ſix miles in length and two in breadth. The banks of this river are richly diverſified with ſome fine natural woods, and various combinations of bold rocky ſcenery. At one place, the river divides, forming the little iſland of Agaith, which is of an oval figure, about one mile and a half in circumference, and riſes gradually about 100 feet above the level of the water. The Beauly is noted for its ſalmon fiſhery, whoſe rents have lately produced 631l. per annum.

BEAUMAN'S, or Bauman's *Iſland*, a claſter of three iſlands, ſo called from the name of the captain who diſcovered them, part of Roggewein's archipelago, ſituated in the great Equinoctial or Pacific Ocean, in about S. lat. 12° W. long. 155° 10′. The diſcovery of theſe iſlands has been aſcribed by ſeveral geographers to Roggewein; and he named them, in 1721, Beauman's iſlands. His own words are theſe: "we diſcovered three iſlands at the ſame time in the 12th degree of latitude, of a very agreeable appearance; we found them ſtocked with fine fruit-trees, herbs, vegetables, and plants of every deſcription. The iſlanders, who came to meet our veſſels, offered us all ſorts of fiſh, cocoa-nuts, bananas, and other excellent fruit. Theſe iſlands muſt be well-peopled, the beach being on our arrival covered with many thouſands of men and women, the greater part of the former carrying bows and arrows. All the inhabitants are white, and only differ from Europeans by ſome of them being much ſun-burnt. They ſeemed good kind of people, lively and gay in converſation, kind and humane towards each other, and nothing of the ſavage in their manners. Their bodies were not painted like thoſe we had before ſeen; they were clothed from the waiſt to the ancle with fringes of ſilken ſtuff artfully wrought; their heads were covered with hats of the ſame kind, very fine and broad, to protect them from the heat of the ſun. Some of theſe iſlands were ten, fourteen, and even twenty miles in circumference. We called them Beauman's iſlands, from the name of the captain of the ſhip Tinhoven, who firſt ſaw them. It muſt be confeſſed (adds the author), that this is the moſt civilized and honeſt nation we have met with in the iſlands of the South ſea. All the coaſts of theſe iſlands have good anchorage, in from 13 to 20 fathoms water." See the extract from the hiſtorical account of Roggewein's voyage, written in French, in 1739, by a German of Mecklenburgh, who was on board Roggewein's fleet, in La Perouſe's Voyage round the World, vol. ii. p. 192. Eng. ed. The other cluſters of iſlands of Roggewein's archipelago, marked in the hydrographical charts annexed to Marchand's Voyage, are Roggewein and Groning, ſituated a little to the north of Beauman's iſlands, and nearly in the ſame longitude. Some have ſuppoſed Beauman's iſlands to be the ſame with thoſe which Bougainville has called "Navigator's iſlands;" but neither the hiſtory of the inhabitants, nor the geographical poſition of the iſlands, warrant this ſuppoſition.

BEAUMARCHEZ, a town of France, in the department of the Gers, 7 leagues weſt of Auch. N. lat. 43° 35'. W. long. 0° 1'.

BEAUMARIS, or Beaumarsh, the principal and county town of the iſle of Angleſea, North Wales, is ſituated on the weſtern bank of the river Menai, which forms a fine ſpacious bay oppoſite the town. The caſtle, intimately connected with the early hiſtory and foundation of this town, owes its origin to Edward I. who, having erected two magnificent fortreſſes at Caernarvon and Conway, deemed it neceſſary to raiſe another at this place, for the purpoſe of enforcing obedience and ſubjection among the conquered Britons of Angleſea. The foundation of this ſtructure was laid in 1295, in a place called Bonover Marſh, which afterwards aſſumed the compound French terms *beau*, *fair*, and *marais*, *marſh*. The favourable ſituation of the caſtle enabled the engineers to make ſuch a foſſe or ditch round it, as might be conſtantly filled with water from the bay, and a canal was alſo cut between the river and caſtle, that ſmall veſſels might carry their freightage immediately to the walls of the latter. This fortreſs being complete, the royal founder appointed ſir William Pickmore, a Gaſcon, the firſt governor, who was alſo nominated captain of the town. The ſame perſon (one inſtance excepted) was always appointed to theſe two offices; and his annual ſalary was forty pounds as conſtable, and twelve pounds three ſhillings and four-pence as captain. The caſtle and town were guarded by 24 ſoldiers, at four-pence a day each. Other perſons had proportionable pay, yet from every man's ſalary a certain ſum was deducted monthly towards the payment of itinerant preachers and teachers, and for letters and intelligence. The caſtle becoming very burthenſome to the people, occaſioned many contentions between the inhabitants of the town and thoſe of the fortreſs. Battles ſometimes enſued. One of them called the black fray, happened on a market-day, in the time of Henry VI. and it produced great ſlaughter. The hiſtory of theſe fortreſſes preſents a continued ſeries of oppreſſion and irritation; and it ſeemed a grand policy of the Engliſh governors to exclude the Welſh from thoſe ſtrong holds, and their dependant towns, which they had wreſted from the ſubjugated Cambrians. By a rental of the borough property of Beaumaris, taken even ſo late as 1608, there appear only ſeven Welſh names, and one burgage in the tenure of a Welſhman. The caſtle was given by Henry IV. to Percy, earl of Northumberland, for life; and Richard III. granted the conſtableſhip and captainſhip of the caſtle and town to ſir Richard Huddleſtone, knight. From the time of ſir Rowland Villeville, alias Brittayne, the reputed baſe ſon of Henry VII., and conſtable of the caſtle, the garriſon was withdrawn till 1642, when Thomas Cheadle, then conſtable, repleniſhed it with men and ammunition. It was then held for Charles I. whoſe throne was in danger. The gentlemen of this town and iſland being warm partiſans for the monarchy, determined to oppoſe the parliamentary forces which had aſſembled at Conway, and had deputed five commiſſioners to manage their buſineſs. The iſlanders refuſing to ſurrender on ſummons, were invaded by about 1500 men, horſe and foot, whoſe ſuperior diſcipline and courage ſoon routed and conquered the royaliſts. On the 2d of October 1648, the town and caſtle ſurrendered to general Mytton: colonels Bulkeley and Whitely were made priſoners; and the inhabitants agreed to pay to their conquerors 7000l. within fourteen days. The caſtle is now the property of the crown. It ſtands in the grounds of lord Bulkeley, attached to the eaſt end of the town, and covers a conſiderable ſpace of ground. Though partly in ruins, yet its outer walls, ſeveral towers, and many parts remain, to characteriſe its dimenſions and architecture. It is ſurrounded by a foſſe, with an entrance to the eaſt between two embattled round and ſquare towers. Within theſe is the principal body of the caſtle, which is nearly of a ſquare form, having a round tower at each angle, and another in the centre of each face. The area is an irregular octagon, about 57 yards from north to ſouth, and 60 from eaſt to weſt. In the middle of the north ſide is the hall, twenty yards long and twelve wide. What was formerly the porter's lodge is now uſed as the bridewell. A gallery of communication extended round the buildings of the inner court; and in different receſſes of this were ſquare holes, which ſeemed to have opened into dungeons beneath. The two eaſtern towers ſerved alſo as dungeons, the deſcent to which was dark and narrow. On the eaſtern ſide of the caſtle was a ſmall chapel, ſome of which remains.

The town of Beaumaris is not very ancient; nor do we find any particular records of it previous to the erection of the caſtle, ſoon after which it aſſumed ſome conſequence, and Edward I. ſurrounded it with a wall, made it a corporation, and endowed it with certain privileges. In the 27th of Henry VIII. Angleſea, with eleven other counties of Wales were impriviled and ſummoned to ſend members to parliament, but no return was made from this county till the 33d of Henry VIII. when Newborough, now a poor decayed village, ſent one member. Since the 2d of Edward VI. Beaumaris has been regularly repreſented by one member, and the right of voting was veſted, in 1729, in a mayor, two bailiffs, and twenty-one capital burgeſſes. Though this town has not an extenſive trade, yet it has a cuſtom houſe for the caſual reception of goods, a large town-hall with aſſembly-room, a free ſchool, alms-houſe, and a handſome church or chapel with a lofty ſquare tower. The free ſchool and alms-houſe were founded by David Hughes; the firſt in 1603, and the latter in 1613. Here are a weekly market on Saturday, and four annual fairs. It is ſituated 59 miles W. by N. from Cheſter, and 252 N.W. of London. N. Lat. 53° 14'. W. long. 4° 15'.

The *Bay* of Beaumaris forms a fine expanſe of water before the town, and ſhips can ride ſafe at anchor in ſix or ſeven fathom water, even when the tide is out. From this to the oppoſite ſhore at Aber is a diſtance of about four miles, yet the channel at low water does not occupy above one mile. The remainder is a uniform bed of ſand, called Traeth-Telavan, or the Lavan ſands. Theſe, the Welſh ſuppoſe, were anciently quite free from water, and formed a habitable part of Carnarvonſhire; which Mr. Pennant admits, and endeavours to prove, by ſhowing that the ſea has made great encroachments at Abergeley, and that ſeveral bodies and roots of oak trees have been found in a tract of hard loam at a conſiderable diſtance from the preſent ſhores.

About one mile from Beaumaris ſtand ſome ſhattered remains of *Llanfaes*, which Camden called "a famous religious houſe in times paſt," and belonged "to the friars minors, unto whom the kings of England ſhewed themſelves very bountiful patrons, as well in regard to the friar's holineſs, as alſo becauſe (that I may ſpeak out of the public records of the kingdom) were buried a daughter of king John, a ſon of a king of the Danes, the bodies alſo of the lord Clifford, and other knights and ſquires, who in the time of the noble and renowned kings of England were ſlain in the wars againſt the Welſh." This monaſtery, erected by Llewelyn ap Jorwerth, was conſecrated, in 1240, by Howel, biſhop of Bangor; and in a few years afterwards burnt in the inſurrection of Madoc. At the diſſolution, Henry VIII. ſold the convent and its poſſeſſions to one of his courtiers. The family of Whyte (now extinct) afterwards became poſſeſſed of it, and built a reſpectable houſe, which has ſince been enlarged, modernized, and the grounds much improved. It is

is now one of the seats of sir Robert Williams, Bart. Near this place a severe battle was fought, in 819, between the Welsh and the Saxons under their leader Egbert, who had invaded the island, and given it then, for the first time, the name of Angle-sea. The Saxons at first proved victorious, but were strongly opposed by Merfyn Frych, the Welsh prince, who after some severe battles expelled the invaders from this island.

Two miles north of Friars are the remains of the priory of *Penmon*, consisting of little more than the ruinous refectory and part of the church. This priory for Benedictine monks was endowed, if not founded, by prince Llewelyn ap Jorwerth before 1221.

Near Penmon is a *well* surrounded with a wall and stone seats, having two doors or entrances. This was a sacred, baptismal, or holy well. About a quarter of a mile distant is an ancient cross, six feet high, the shaft of which is curiously ornamented with sculptured chequered work. At the distance of about one mile from the shore is *Ynis Seiriol*, or Seiriol's island, now called Priest-holme. This was once appendant to the monastery of Penmon; and the remains of a square tower still mark its religious appropriation. This island is sometimes called Puffin island, from its being much frequented by birds of that name. From the beginning of April to the beginning of August, immense numbers of these and other sea-fowl resort to this spot. To the west of Priest-holme are three smaller islands, called Ynis Llygod, or the Mouse islands.

In the channel which waters these islands, the large oysters called the *Penmon* are taken by the dredge, and great quantities are pickled, packed in small casks, and sent to different parts of the kingdom.

Baron-hill, the seat of lord Bulkeley, is finely seated on an eminence, overlooking the town, castle, &c. The original mansion of this family in Wales was *Court mawr*, in Castle-street, Beaumaris. The present mansion was built by sir Richard Bulkeley, for prince Henry, son of James I. The house has since been enlarged and greatly improved by its present possessor, under the direction of Mr. S. Wyatt. The grounds of this domain are singularly fine and beautiful, and the various prospects of sea, mountain, and sylvan scenery, are highly grand and interesting.

About seven miles south-west of Beaumaris is *Plas-Newydd* an elegant modern mansion, built in a castellated style, belonging to the earl of Uxbridge. The house is large, commodious, and handsome, and the ancient woods around it give it a venerable character. Close behind the house are two Cromlechs, the largest of which has been long designated by the name of "Cromlech of Mona." See Cromlech. See an interesting poem called "Beaumaris Bay," with notes: "A Tour round North Wales," by the Rev. W. Bingley; and "Mr. Pennant's Tours in North Wales."

BEAU-MASS. See Mass.

BEAUME Cave. See Baume.

BEAUMEILLE, Laurent-Angliviel de la, in *Biography*, a modern French writer, was born in 1727, at Valleraugues, in the diocese of Allais. Having been invited to Denmark to undertake a professorship of French Belles Lettres, he opened his course by a "Discourse," printed in 1751. But the climate being too severe for his constitution, he quitted Denmark with a pension and the title of counsellor. In his return by way of Berlin, he wished to form an acquaintance with Voltaire, of whose writings he was a passionate admirer; but their irritable dispositions produced a quarrel, which admitted of no reconciliation, and which produced personalities equally disreputable to both. On his arrival at Paris, in 1753, his publication, entitled "Mes Pensées," caused him to be confined in the Bastile; and soon after his liberation he was committed to the same prison on account of his "Memoirs of Maintenon." After his second liberation, he retired into the country; but in 1772, he was called back to Paris to occupy the post of king's librarian, from which death removed him in consequence of a disorder of his breast, in November 1773. The principal of his works are "A Defence of the Spirit of Laws;" "Mes Pensées," a satirical work; "Mem. of Mad. Maintenon," 6 vols. 12mo. soon followed by 9 vols. of her "Letters;" "Letters to M. de Voltaire," 1761, 12mo. upon the perusal of which Voltaire acknowledged, "the rascal has a great deal of wit;" "Thoughts of Seneca," Latin and French; and "Commentary on the Henriade," 1775, 2 vols. 8vo. He left some MSS. He is said to have been of an open and frank temper, but hasty, captious, and addicted to satire. Nouv. Dict. Hist.

BEAUMENIL, in *Geography*, a town of France, in the department of the Eure, and chief place of a canton, in the district of Bernay; 2 leagues S. S. E. of Bernay. The place contains 448 and the canton 9330 inhabitants, on a territory of 190 kiliometres containing 21 communes.

BEAUMES, a town of France, chief place of a canton in the department of Vaucluse and district of Orange. The place contains 1373 and the canton 5452 inhabitants: the territory includes 122½ kiliometres and 9 communes.

BEAUMETZ-LES-LOGES, a town of France, in the department of the Straits of Calais, and chief place of a canton in the district of Arras; 2 leagues S.W. of Arras. The place contains 318 and the canton 10,683 inhabitants: the territory includes 187½ kiliometres and 29 communes.

BEAUMONT, Elie de, in *Biography*, was born at Charenton, in Normandy, in 1732, and admitted an advocate in 1752, in which profession he did not succeed for want of voice. Upon his retirement from the bar, he became a writer, and addressed a variety of eloquent pieces to the magistrates and to the public. His memoir in behalf of the unfortunate Calas family produced a permanent effect. This was succeeded by many others, no less interesting and pathetic. Beaumont's imagination was lively, but like other persons of the same cast, he was liable to dejection. He was lord of Caen, in Normandy, where he instituted an interesting festival, called "Fête des bons gens," or the good folks' feast. He died at Paris, in 1785.

The wife of the preceding, Madame Elie du Beaumont, was born at Caen in 1730, and is known with reputation by her "Letters of the Marquis de Roselle," 12mo. a novel, which exhibits a faithful picture of the manners and characters of the courtiers of the day, and of their sycophants and dependants. In society she was beloved and respected by reason of the amiableness of her disposition, the polite ease of her manners, the soundness of her understanding, and the extent of her knowledge. She died at Paris in 1783. Nouv. Dict. Hist.

Beaumont, Francis, an eminent dramatic poet, was the son of Francis Beaumont, one of the judges of the common pleas, and born at Grace-Dieu, in Leicestershire, an ancient seat of the family, in 1585 or 1586. He was educated at Cambridge, and afterwards admitted a student in the Inner Temple, where his devotion to the Muses diverted his attention from the study of the law. Beaumont and Fletcher were so intimately connected, and wrote so much in concert, that it is difficult at this distance of time to assign to each his appropriate part in the numerous compositions, tragic and comic, which have been published under their common names. Tradition reports, and probably with truth, that Beaumont was peculiarly distinguished by judgment, which was commonly employed in correcting and retrenching the superfluities of Fletcher's wit. It appears, however, from

an examination of Beaumont's diſtinct productions, and particularly his little Maſque of the Inner Temple and Gray's Inn, and alſo a poem entitled the "Hermaphrodite," that he was by no means deſtitute of poetic imagination and invention, and that his verſification is elegant and harmonious. Beaumont was eſteemed ſo accurate a judge of plays, that Ben Jonſon, who expreſſed his affectionate regard for him in a copy of verſes, ſubmitted all his writings to his cenſure, and is thought to have availed himſelf of his judgment in correcting, if not in contriving, all his plots. He died before he had attained the age of 30 years, in March, 1615; and left a daughter, who was in poſſeſſion of ſeveral poems of her father's writings, but they were all loſt at ſea in a voyage from Ireland, where ſhe had lived for ſome time in the duke of Ormond's family. Beſides the plays in which he was jointly concerned with Mr. Fletcher (for an account of which ſee FLETCHER), he wrote the dramatic piece above mentioned, entitled, "A Maſque, &c." "A Poetical Epiſtle to Ben Jonſon," "Verſes to his Friend Maſter John Fletcher upon his Faithful Shepherdeſs," and other poems, printed together in 1653, 8vo. The elder brother of the preceding, ſir John Beaumont, was diſtinguiſhed by his poetical talents, and was the author of ſeveral pieces which had conſiderable merit. A volume of his miſcellaneous poems was publiſhed by his ſon in 1629. Gen. Dict. Biog. Brit.

BEAUMONT, in *Geography*, a town of France, in the department of the Calvados, and chief place of a canton, in the diſtrict of Pont l'Evêque, 6 leagues E. N. E. of Caen. —Alſo, a town of France, in the department of the Côte d'Or, and chief place of a canton, in the diſtrict of Is-ſur-Tille, 16 miles N. E. of Dijon.—Alſo, a town of France, in the department of the Channel, and chief place of a canton, in the diſtrict of Valognes, 8 miles weſt of Cherburg. The place contains 538 and the canton 9493 inhabitants, on a territory of 192½ kiliometres, including 20 communes. —Alſo, a town of France, in the department of Puy-de-Dôme, and chief place of a canton, in the diſtrict of Clermont-Ferrand, 2 miles ſouth of Clermont.—Alſo, a town of France, in the department of the Seine and Oiſe, and chief place of a canton, in the diſtrict of Ponteiſe, on the Oiſe, 33 miles north of Paris.—Alſo, a town of France, in the department of the Dordogne, and chief place of a canton, in the diſtrict of Bergerac, 3½ leagues weſt of Belvez. The place contains 1505 and the canton 7124 inhabitants on a territory of 170 kiliometres and 14 communes.—Alſo, a town of France, in the department of the Sarte, and chief place of a canton, in the diſtrict of Mamers, 5 leagues N.E. of Le Mans. The place contains 2402 and the canton 14,720 inhabitants: the territory includes 175 kiliometres and 15 communes.

BEAUMONT *en Argonne*, a town of France, in the department of the Ardennes, and chief place of a canton, in the diſtrict of Sedan, 3½ leagues S. S. E. of Sedan.

BEAUMONT-*Les-Forges*, a town of France, in the department of the Nyevre, and chief place of a canton, in the diſtrict of La Charité on the Nyevre, 13 miles north of Nevers.

BEAUMONT *on Gatinois*, a town of France, in the department of the Seine and Marne, and chief place of a canton, in the diſtrict of Nemours, 4 leagues S.W. of Nemours.

BEAUMONT *de Lomagre*, a town of France, in the department of the Upper Garonne, and chief place of a canton, in the diſtrict of Caſtel-Sarrazin, 5 leagues N. W. of Grenade. The place contains 3700 and the canton 11,177 inhabitants: the territory includes 200 kiliometres and 20 communes.

BEAUMONT *Le Roger*, a town of France, in the department of the Eure, and chief place of a canton, in the diſtrict of Bernay, 2½ leagues E. of Bernay. The place contains 1406 and the canton 13,685 inhabitants: the territory includes 227½ kiliometres and 26 communes. N. lat. 49° 5'. E. long. 0° 41'.

BEAUMONT *ſur Veſle*, a town of France, in the department of the Marne, and chief place of a canton, in the diſtrict of Reims, ſeated on the Veſle, 8 miles S.E. of Reims. —Alſo, a town of France, in the department of Jemappe, and chief place of a canton, in the diſtrict of Charleroy. The place contains 1376 and the canton 7458 inhabitants: on a territory of 177½ kiliometres, including 10 communes.

BEAUNE, a town of France, in the department of the Mayne and Loire, and chief place of a canton, in the diſtrict of Baugé, 3 leagues eaſt of Angers, and 3 weſt of Bauge. —Alſo, a town of France, and principal place of a diſtrict, in the department of the Côte d'Or, 7 leagues ſouth of Dijon. The place contains 8344 and the canton 23,090 inhabitants; on a territory of 300 kiliometres. The northern canton includes 13 and the ſouthern 16 communes. N. lat. 47°. E. long. 4° 50'.—Alſo, a town of France, in the department of the Loiret, and chief place of a canton, in the diſtrict of Pithiviers. The place contains 2057 and the canton 14,845 inhabitants: the territory includes 250 kiliometres and 24 communes.

BEAU-PLEADER, or BEW-PLEADER in *Law*, a writ on the ſtatute of Marlbridge, 52 Hen. III. c. 11. whereby it is provided, that no fine ſhall be taken of any man in any court for *fair-pleading*, i. e. for not pleading aptly and to the purpoſe. And beau-pleader is as well in reſpect of vicious pleadings, as of the fair-pleading, by way of amendment. 2 Inſt. 122.

BEAUPRE', in *Geography*, an iſland in the Pacific ocean, ſo called after the name of Beaupré, engineer-geographer to the expedition fitted out for ſearch of La Perouſe, lying weſt of the new Hebrides, in S. lat. 20° 14'. E. long. 161° 27'. It is very low, and about 1500 toiſes long.

BEAUPREAU, a town of France, in the department of the Mayne and Loire, and chief place of a diſtrict, 3 leagues S. of St. Florent. The place contains 1640 and the canton 11,250 inhabitants: the territory includes 260 kiliometres and 11 communes.

BEAUQUESNE, a town of France, in the department of the Somme, and chief place of a canton, in the diſtrict of Doulens, 2 leagues S. E. of Doulens.

BEAURAING, a town of France, in the department of the Sambre and Meuſe, and chief place of a canton in the diſtrict of Dinant: the place contains 452 and the canton 667 inhabitants: the territory includes 257½ kiliometres and 33 communes.

BEAUREGARD, a town of France, in the department of the Dordogne, 4 leagues ſouth of Perigueux.—Alſo, a town of France, in the department of Puy-de-Dôme, 3 leagues eaſt of Clermont-Ferrand.—Alſo, a town of France, in the department of Lot, 5 leagues E.S.E. of Cahors.

BEAUREPAIRE, a town of France, in the department of the Saone and Loire, and chief place of a canton, in the diſtrict of Louhans, 2½ leagues eaſt of Louhans. The place contains 817 and the canton 8405 inhabitants, on a territory of 122½ kiliometres, including 7 communes.—Alſo, a town of France, in the department of the Iſere, and chief place of a canton, in the diſtrict of Vienne, 3 leagues S.E. of Vienne. The place contains 1800 and the canton 9850 inhabitants: on a territory of 195 kiliometres including 14 communes.

BEAURIEUX, a town of France, in the department of the Aiſne, and chief place of a canton, in the diſtrict of Laon, 3½ leagues N. W. of Reims.

BEAUSOBRE, ISAAC DE, in *Biography*, a learned French Calviniſt miniſter, was Born at Niort in Swiſſerland,

in 1659, and descended from a family of Provence, originally named Bosiart, and changed into Beausobre on their retreat into Switzerland from the massacre of St. Bartholomew's. Having completed his education at the protestant college of Saumur, he declined the profession of the law, in which he was tempted to engage by flattering prospects, and determined to devote himself to the Christian ministry. Accordingly he was ordained at the age of 22 years, and served a church in France for 3 or 4 years; but when his place of worship was shut up, his zeal prompted him to break the king's seal, which was affixed to the doors; and on this account being condemned to an "amende honorable," he left his country, and took refuge in Holland. Under the patronage of the princess of Orange, he was appointed chaplain to her daughter, the princess of Anhalt Dessau; and in 1686, settled at Dessau, where he had leisure to prosecute his studies. In 1693, he published the first result of his theological acquisitions, under the title of "A Defence of the Reformed," which was very favourably received by his party. In 1694, he obtained a very advantageous settlement among the French refugees at Berlin, which was the place of his residence for the remainder of his life. Here he sustained several offices of distinction among his brethren, and discharged the duties connected with them in a manner honourable to himself, and satisfactory to them. At the same time he was assiduous in his application to his studies, and thus acquired that extensive erudition, for which he was so eminent. The first work which he undertook, and which occupied many years of his life, was "A History of the Reformation." This work, which he left in manuscript for the press, was published at Berlin in 2 vols. large 8vo. in 1784, 1785, under the title of "Histoire de la Reformation, ou Origin et Progrés du Lutheranisme dans l'Empire, &c." i. e. A History of the Reformation, or an Account of the Origin and Progress of Lutheranism in the Empire, and in the States where the Confession of Augsburg was received, from the year 1517 to 1530. Although the origin and progress of Lutheranism be the principal objects of this work, in the discussion of which the author has availed himself of the materials contained in the excellent history of Seckendorff, it contains also details and illustrations of several politico-ecclesiastical transactions, that are not to be found in Seckendorff, or in any other writer known to us. It also comprehends very curious and ample details relative to the progress of the reformation in France and Switzerland, and the characters, learning, and writings of those who stood foremost in maintaining or opposing the doctrines and remonstrances of the reformers. Beausobre was also employed with his colleague the learned l'Enfant by the court of Berlin in a French version of the New Testament. This work, of which St Paul's epistles fell to the share of Beausobre, was published in 1718, in 2 vols. 4to. with an ample preface and notes, and was well received. Beausobre was one of the principal members of the new society, denominated "Anonymous," and contributed several pieces to the "Bibliothéque Germanique," of which journal he was the director as long as he lived. His papers are "A Dissertation on the Adamites of Bohemia;" "A Dissertation on the statue of Pasquin;" "On the Virgin Queen of Poland;" and "Conversation on Images." But the most elaborate and esteemed of his works is his "History of Manichees and of Manichéism," in 2 vols. 4to. French; the first, published at Amsterdam, in 1734, and the second, after his death, in 1739, to which is annexed a posthumous dissertation sur les Nazaréens, Lausanne, 1745. To the character of this work, very generally applauded by the learned for the extent of its erudition and the singularity of its candour, we shall subjoin the following testimonies. The celebrated historian Gibbon says of it (Hist. Decl. &c. vol. viii. p. 260, note): "This is a treasure of ancient philosophy and theology. The learned historian spins with incomparable art the systematic thread of opinion, and transforms himself by turns into the person of a saint, a sage, or an heretic. Yet his refinement is sometimes excessive: he betrays an amiable partiality in favour of the weaker side, and while he guards against calumny, he does not allow sufficient scope for superstition and fanaticism." The candid and impartial Lardner (Works, vol. iii. p. 539.), after acknowledging his obligations to Beausobre, from whom however he occasionally differs, says of this work, that "it contains not only a laboured history of the Manichees, but likewise several entertaining and useful digressions concerning the opinions of the heathen philosophers, and the most early Christian sects;" and he closes with expressing a wish, "that some learned man might have sufficient leisure and encouragement to give us a handsome edition of it in English." "As for me," says Beausobre himself (Hist. Man. t. ii. p. 730.) "whom heaven has preserved from the spirit of the church, who knew no greater good than freedom of thought, nor any more delightful employment than the search of truth, nor greater pleasure than that of finding and speaking it, I have studied ecclesiastical history with as little prejudice as possible."

In the composition of his sermons, Beausobre employed much time and care, and they contained much original matter, moral and theological, and a fund of the most striking oratory. His talents for preaching, and his powers for conversation, continued unimpaired to his seventy-ninth year. He was eminently a polished scholar, and adorned a person, naturally agreeable and prepossessing, with all the acquired graces of good company. The qualities of his heart were no less distinguished than the faculties of his understanding. He was kind, generous, chearful, and disinterested, always ready to perform acts of friendship, and detesting every degree of malevolence and slander. He enjoyed life without interruption from the weaknesses of advanced age to his 80th year, and died on June 5th, 1738. Beausobre was twice married, and left children by both wives, of whom Charles Lewis was pastor of a church in Berlin, and made himself known by some learned works; and Leopold was colonel of a regiment in the Russian service. Four volumes of posthumous sermons were printed at Lausanne, in 1755. Mem. sur la Vie, &c. de Beausobre, prefixed to the second volume of his Hist. du Manicheisin.

BEAUSSUT, Le, in *Geography*. See Bausset.

BEAUTY, in a general and popular sense, denotes that quality, or assemblage and union of qualities in the objects of our perception, whether they be material, intellectual, or moral, which we contemplate with emotions of complacence and pleasure; and it is referred by many writers to a principle or faculty, called by some an "internal sense," and by others "taste." (See these articles.) In a more strict and philosophical sense, beauty may denote that sentiment or feeling which is excited in the mind by objects of perception, that are adapted to inspire love, or some similar passion, or to give pleasure.

The word Beauty, according to Dr. Hutcheson, (Enquiry concerning Beauty, &c. p. 7.) signifies the idea raised in us; and a sense of beauty denotes our power of receiving this idea, which he denominates an internal sense. This ingenious writer considers beauty as original or absolute, and comparative or relative. By the former, however, he does not understand any quality supposed to exist in the object, which should of itself be beautiful, without relation to any mind which perceives it; for beauty, he says, like other names of sensible ideas, properly denotes the perception of some

ſome mind; and, therefore, by abſolute beauty he means only that beauty which we perceive in objects without compariſon to any thing external, of which the object is ſuppoſed to be an imitation or picture; ſuch as that beauty perceived from the works of nature, artificial forms, figures, and theorems. Whereas comparative or relative beauty is that which we perceive in objects, commonly conſidered as imitations or reſemblances of ſomething elſe. The general ſource of our ideas of beauty, according to this writer, is uniformity amidſt variety; and what we call beautiful in objects ſeems to be in a compound ratio of uniformity and variety, ſo that where the uniformity of bodies is equal, the beauty is as the variety, and vice verſâ. This poſition he illuſtrates by a number of examples deduced from different figures, from the works of nature, from the inward ſtructure and outward form of animals, and the proportion of their parts to each other, from the harmony of ſound, from theorems or univerſal truths, and from the works of art. Relative beauty is founded, as he conceives, on a conformity, or a kind of unity between the original and the copy; and for obtaining this ſort of beauty it is not neceſſary that there ſhould be any beauty in the original; for an exact imitation may ſtill be beautiful, though the original is altogether deſtitute of beauty. A ſenſe of beauty from uniformity amidſt variety is, in his opinion, univerſally prevalent among mankind; and for the truth of the fact, he appeals to experience. The ſame ingenious writer deduces all our ideas of virtue from an implanted ſenſe, called "Moral ſenſe;" (which ſee); and he deſcribes moral good and evil by the effects accompanying the perception of them.

Dr. Price, in his inquiry into the origin of our ideas of beauty and deformity of actions, (ſee "Review of the principal Queſtions in Morals," ch. i. and ii.) diſtinguiſhes between our perception of right and wrong, and our perception of beauty and deformity, in conſidering the actions of moral agents. He obſerves that, in contemplating ſuch actions, we have both a perception of the underſtanding and a feeling of the heart; and that the latter, or the effects in us accompanying our moral perceptions, depend on two cauſes; partly on the poſitive conſtitution of our nature, but principally on the eſſential congruity or incongruity between moral ideas and our intellectual faculties. "Placet ſuapte natura-virtus," Seneca. "Etiamſi a nullo laudetur, natura eſt laudabile." Tully. He apprehends, that the above-mentioned author was led to derive all our ideas of virtue from an implanted ſenſe, in conſequence of not duly conſidering the difference between the "honeſtum," and "pulchrum," the "δικαιον," and "καλον," of actions; or of not carefully diſtinguiſhing between the diſcernment of the mind and the ſenſations attending it in our moral perceptions. With him the *rectitude* of an action is the ſame with its *gratefulneſs* to the obſerver; and wrong, the contrary. But what, ſays this writer, can be more evident, than that *right* and *pleaſure*, *wrong* and *pain*, are as different as a cauſe and its effect; what is *underſtood* and what is *felt*; *abſolute truth*, and its *agreeableneſs* to the mind. Mr. Balguy indeed (ſee his "Tracts on the Foundation of Moral Goodneſs, p. 61.") is of opinion, that all beauty, whether natural or moral, is a ſpecies of abſolute truth; as reſulting from, or conſiſting in, the neceſſary relations and congruities of ideas. As to moral beauty, ſays Dr. Price, one would think, that the author juſt cited muſt mean, though his meaning is not very intelligible, that it denotes a real quality of certain actions. But the word beauty ſeems always to refer to the reception of pleaſure; and therefore the beauty of an action, or character, muſt ſignify its being ſuch as pleaſes us, or having an aptneſs to pleaſe when perceived. Nor can it be juſt to conceive more in the action itſelf, or to affirm more of it, than this *aptneſs*, or that objective goodneſs or rectitude on which it depends. Beauty and lovelineſs are ſynonymous; but an object *ſelf-lovely* can only mean an object, by its nature, fitted to engage love. It may be added, that the epithets beautiful and amiable are, in common language, confined to actions and characters that pleaſe us highly, from the peculiar degree of moral worth and beauty apprehended in them. All virtuous actions muſt be pleaſing to an intelligent obſerver; but they do not all pleaſe to the degree neceſſary to entitle them to theſe epithets, as they are generally applied. Theſe obſervations are applicable, as Dr. Price thinks, with a little variation, to natural beauty; the general ſenſe of which, according to Dr. Hutcheſon, is uniformity amidſt variety. If we aſk, why this pleaſes? The proper anſwer is, that by its nature it is adapted to pleaſe. There ſeems, as Dr. P. obſerves, no more occaſion in this caſe to have recourſe to an implanted ſenſe than in the former. Regular objects contribute towards producing the complacency of our minds, and the preference we give them, becauſe they are more eaſily viewed and comprehended by the mind; becauſe order and ſymmetry give objects their ſtability and ſtrength, and ſubſerviency to any valuable purpoſe; and becauſe regularity and order evidence art and deſign. Brutes are incapable of the pleaſures of beauty, becauſe they proceed from a compariſon of objects, and a diſcernment of analogy, deſign, and proportion, to which their faculties do not reach.

To Dr. Hutcheſon's theory of beauty, which aſcribes it to uniformity amidſt variety, it has been objected, that, though it accounts in a ſatisfactory manner for the beauty of many figures, yet when we endeavour to apply this principle to beautiful objects of ſome other kind, as to colour or motion, it will be found irrelative. And even in external figured objects, it is not juſt, that their beauty is in proportion to their mixture of variety, with uniformity, as many are highly beautiful and pleaſe us much, which have no variety at all, and others which poſſeſs variety to a degree of intricacy. With reſpect to the opinion, that natural beauty is a real quality of objects, it may be obſerved, that it ſeems impoſſible for any one to conceive the objects themſelves to poſſeſs more than a particular order of parts, and certain powers, or an affinity to our perceptive faculties, thence ariſing: and if we call this beauty, then it is an abſolute inherent quality of certain objects, and equally exiſting, whether our mind diſcerns it or not. However, order and regularity are, more properly, the cauſes of beauty than beauty itſelf.

Beauty, ſays another ingenious writer, (ſee Reid's Eſſay on the Intellectual Powers of man, ch. iv.) is found in things ſo various and ſo very different in nature, that it is difficult to ſay, wherein it conſiſts, or what can be common to all the objects in which it is found. Of the objects of ſenſe we find beauty in colour, in ſound, in form, in motion. There are beauties of ſpeech, and beauties of thought; beauties in the arts, and in the ſciences; beauties in actions, in affections, and in characters. In things ſo different, and ſo unlike, is there any quality, the ſame in all, which we may call by the name of beauty? Why then ſhould things ſo different be called by the ſame name? They pleaſe, and are denominated beautiful, not in virtue of any one quality common to them all, but by means of ſeveral different principles in human nature. The agreeable emotion, excited by them, and called beauty, is produced by different cauſes. However, though there be nothing common in the things themſelves, yet the kinds of beauty, which ſeem to be as various as the objects to which it is aſcribed, muſt have ſome common relation to us, or to ſomething elſe, which leads us to give them the ſame name. All the objects we call beautiful, agree in two things, which ſeem to concur in our

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ſenſe of beauty. Firſt, when they are perceived, or even imagined, they produce a certain agreeable emotion or feeling in the mind; and ſecondly, this agreeable emotion is accompanied with an opinion or belief of their having ſome perfection or excellence belonging to them. Whether the pleaſure we feel in contemplating beautiful objects may have any neceſſary connection with the belief of their excellence, or whether that pleaſure be conjoined with this belief, merely by the good pleaſure of our Maker, Dr. Reid does not determine. Beautiful objects excite an emotion of a ſoothing and enlivening kind, that ſweetens the temper, allays angry paſſions, and promotes every benevolent affection, and diſpoſes to other agreeable emotions, ſuch as thoſe of love, hope, and joy. "There is nothing," ſays Mr. Addiſon, "that makes its way more directly to the ſoul than beauty, which immediately diffuſes a ſecret ſatisfaction and complacence through the imagination, and gives a finiſhing to any thing that is great and uncommon. The very firſt diſcovery of it ſtrikes the mind with an inward joy, and ſpreads a chearfulneſs and delight through all its faculties." This agreeable emotion, produced by beautiful objects, is accompanied with an opinion or judgment of ſome perfection or excellence of thoſe objects, adapted by its nature for producing that emotion; and this, according to Dr. Reid, is a ſecond ingredient in our ſenſe of beauty. To aſſert, ſays this writer, that there is in reality no beauty in thoſe objects, in which all men perceive beauty, is to attribute to man fallacious ſenſes; and thus to think diſreſpectfully of the Author of our being; who has diffuſed over all the works of nature a profuſion of beauties, which are real, and not fanciful, and thouſands of which our faculties are too dull to perceive. This author diſtinguiſhes our determinations with regard to the beauty of objects into two kinds, viz. inſtinctive and rational. In the former caſe, objects ſtrike us at once, and appear beautiful at firſt ſight, without any reflection, and without our being able to ſay why we call them beautiful, or being able to ſpecify any perfection which ſatisfies our judgment. Whereas our rational judgment of beauty is grounded on ſome agreeable quality of the object, which is diſtinctly conceived, and may be ſpecified. Beauty itſelf may be diſtinguiſhed into original, and derived. It is natural and agreeable to the ſtrain of human ſentiments and of human language, ſays Dr. Reid, that in many caſes the beauty which originally and properly exiſts in the things ſignified, ſhould be tranſferred to the ſign; that which is in the cauſe to the effect; that which is in the end to the means; and that which is in the agent to the inſtrument. E. G. The beauty of good breeding is not originally in the external behaviour in which it conſiſts; it is derived from the qualities of mind, which it expreſſes; and though there may be good breeding without the amiable qualities of mind, its beauty is ſtill derived from what it naturally expreſſes. Good breeding is the picture; theſe agreeable qualities are the original; and it is the beauty of the original that is reflected to our ſenſes by the picture.

As to the uſe of the term beauty, ſome have extended it ſo as to include every thing that pleaſes a good taſte; and others have reſtricted it to the objects of ſight, when they are either ſeen, remembered, or imagined. But the latter ſenſe is much too limited, as there are beauties of various kinds, that are not objects of ſight, ſuch as thoſe of muſic, compoſition, character, affections, and actions; and as perſons may be competent judges of ſeveral ſorts of beauty, who are deprived of the faculty of ſight. It may be obſerved, that as the proper object of admiration is grandeur, beauty is the proper object of love and eſteem: and this connection of beauty with real perfection was a capital doctrine of the Socratic ſchool. It is often aſcribed to Socrates in the dialogues of Plato and of Xenophon. We may, therefore, juſtly aſcribe beauty to thoſe qualities that are the natural objects of love and kind affection: of this kind are thoſe moral virtues, which in a peculiar manner conſtitute a lovely character; ſuch as innocence, gentleneſs, condeſcenſion, humanity, natural affection, public ſpirit, and the whole train of the ſoft and gentle virtues: qualities which are amiable from their very nature, and on account of their intrinſic worth. There are alſo many intellectual talents, which excite our love and eſteem of thoſe who poſſeſs them, ſuch are knowledge, good ſenſe, wit, humour, chearfulneſs, good taſte, excellence in any of the fine arts, eloquence in dramatic action, and alſo excellence in every art of peace or war that is uſeful to ſociety. There are likewiſe talents or accompliſhments, which we refer to the body, that have an original beauty and comelineſs; ſuch as health, ſtrength, and agility, the uſual attendants of youth, ſkill in bodily exerciſe, and ſkill in the mechanic arts. Dr. Reid is of opinion, that beauty originally dwells in the moral and intellectual perfections of mind, and in its active powers, and that from this, as the fountain, all the beauty which we perceive in the viſible world is derived. This was the opinion of the ancient philoſophers above named; and it has been adopted by lord Shaftſbury and Dr. Akenſide among the moderns.

"Mind, mind alone! bear witneſs earth and heav'n,
The living fountains in itſelf contains
Of beauteous and ſublime. Here, hand in hand,
Sit paramount the graces. Here, enthron'd,
Celeſtial Venus, with divineſt airs,
Invites the ſoul to never-failing joy." AKENSIDE.

But neither mind, nor any one of its qualities or powers, is an immediate object of perception to man. Theſe are perceived through the medium of material objects, on which their ſignatures are impreſſed. The ſigns of theſe qualities are immediately perceived by the ſenſes, and by them reflected to the underſtanding: and we are apt to attribute to the ſign the beauty which is properly and originally in the thing ſignified. Thus, the Inviſible Creator hath ſtamped on his works ſignatures of his divine wiſdom, power, and benignity, which are viſible to all men. The works of men in ſcience, in the arts of taſte, and in the mechanical arts, bear the ſignatures of thoſe qualities of mind, which were employed in their production. Their external behaviour or conduct in life expreſſes the good or bad qualities of their minds. In every ſpecies of animals we perceive by viſible ſigns their inſtincts, appetites, affections, or ſagacity; and even in the inanimate world, there are many things analogous to the qualities of mind; ſo that there is hardly any thing belonging to mind, which may not be repreſented by images taken from the objects of ſenſe; and, on the other hand, every object of ſenſe is beautiful, by borrowing attire from attributes of the mind. Thus, the beauties of mind, though inviſible in themſelves, are perceived in the objects of ſenſe, on which their beauty is impreſſed. Thus alſo, in thoſe qualities of ſenſible objects to which we aſcribe beauty, we diſcover in them ſome relation to mind, and the greateſt in thoſe that are moſt beautiful. The qualities of inanimate matter, in which we perceive beauty, are ſound, colour, form, and motion: the firſt being an object of hearing; and the other three of ſight. Theſe ſeveral qualities are particularly illuſtrated by Dr. Reid, with a view of evincing the beauty that reſpectively belongs to them. Every beauty in the vegetable creation, of which we form any rational judgment, expreſſes ſome perfection in the object, or ſome wiſe contrivance in the author. In the animal kingdom we perceive ſuperior beauties, reſulting from life, ſenſe, activity, various inſtincts and affections, and in many caſes, great ſagacity; which are attributes of mind, and poſſeſs an original beauty. In their manner of life we obſerve, that they poſſeſs powers, outward form, and inward ſtructure, exactly adapted to it;

and the more perfectly any individual is fitted for its end and manner of life, the greater is its beauty. But of all the objects of ſenſe, the moſt ſtriking and attractive beauty is perceived in the human ſpecies, and particularly in the fair ſex. In the following well-known paſſage of Milton, this great poet derives the beauty of the firſt pair in paradiſe from thoſe expreſſions of moral and intellectual qualities, which appeared in their outward form and demeanour.

"Two of far nobler ſhape, erect and tall,
Godlike erect! with native honour clad,
In naked majeſty, ſeem'd lords of all,
And worthy ſeem'd, for in their looks divine,
The image of their glorious Maker, ſhone
Truth, wiſdom, ſanctitude ſevere, and pure:
Severe, but in true filial freedom plac'd,
Whence true authority in man; though both
Not equal, as their ſex not equal ſeem'd,
For contemplation he, and valour form'd,
For ſoftneſs ſhe, and ſweet attractive grace."

The author of "Crito," or "a Dialogue on Beauty," conſidered in its reference to the human ſpecies, and particularly to the female ſex, aſcribed to the author of "Polymetis," and republiſhed by Dodſley, in his collection of "Fugitive Pieces," reduces this ſpecies of beauty to the four heads of colour, form, expreſſion, and grace: the two former of which may be called the body, and the two latter, the ſoul of beauty. As for the beauty of *colour*, if we allow for aſſociations and prepoſſeſſions ariſing from difference of climate and peculiarity of conſtitution, that have great influence on the internal ſenſe, as well as on thoſe ſenſes that are external, and conſequently on the judgment, it ſeems to depend, according to the common eſtimate of mankind, on that quality, as it expreſſes perfect health and livelineſs, and in the fair ſex, ſoftneſs and delicacy; nor can any thing be called deformity but what indicates diſeaſe and decline. The beauty of colour, therefore, is derived from the perfection which it expreſſes. "Venuſtas et pulchritudo corporis ſecerni non poteſt a valetudine." Cicero. The moſt beautiful *form* or proportion of parts, according to this author, is that which indicates delicacy and ſoftneſs in the fair ſex; and in the male, either ſtrength or agility; ſo that the beauty of form lies altogether in expreſſion. With regard to *expreſſion*, he obſerves, that this has greater power than either colour or form; and that it is only the expreſſion of the tender and kind paſſions that gives beauty; that all the cruel and unkind ones add to deformity; and that, on their account, good nature may very properly be ſaid to be the beſt feature, even in the fineſt face. Modeſty, ſenſibility, and ſweetneſs, blended together, ſo as either to enliven or correct each other, give almoſt as much attraction as the paſſions are capable of adding to a very pretty face. It is owing to this force of pleaſingneſs, which attends all the kinder paſſions, ſays this author, that lovers not only ſeem, but really are, more beautiful to each other than to the reſt of the world; and in their mutual preſence and intercourſe there is, as a French writer has well expreſſed it, a ſoul upon their countenances, which does not appear when they are abſent from one another, or even in company that lays a reſtraint upon their features. The laſt and nobleſt part of beauty is *grace*, which this author thinks to be incapable of an accurate definition (ſee GRACE). All the ingredients of beauty, enumerated and deſcribed by this ingenious author, terminate in expreſſion: they expreſs either ſome perfection of the body, as a part of the man, and an inſtrument of the mind, or ſome amiable quality or attribute of the mind itſelf.

Dr. Blair (Lectures, vol. i. p. 101, &c.), in his enumeration of the ſeparate principles of beauty, in each of thoſe claſſes of objects, which moſt remarkably exhibit it, begins with *colour*, as affording the ſimpleſt inſtance of beauty. With reſpect to this he obſerves, that neither variety, nor uniformity, nor any other principle which he knows, can be aſſigned as the foundation of beauty; and that it can be referred to no other cauſe but the ſtructure of the eye, which determines us to receive certain modifications of the rays of light with more pleaſure than others. As this organ varies in different perſons, they have their different reſpective favourite colours. In ſome caſes, he thinks it probable, that aſſociation of ideas has influence on the pleaſure which we receive from colour. Green, for inſtance, may appear more beautiful, by being connected in our ideas with rural proſpects and ſcenes; white, with innocence; blue, with the ſerenity of the ſky. Independently of ſuch aſſociations, thoſe colours, choſen for beauty, are, generally, delicate, rather than glaring. *Figure* opens to us forms of beauty more complex and diverſified. Under this head, regularity is firſt noticed as a ſource of beauty. Thus a circle, a ſquare, a triangle, or a hexagon, pleaſe the eye, by their regularity, as beautiful figures. But regularity is not the ſole, or the chief foundation of beauty in figure. On the contrary, a certain graceful variety is found to be a much more powerful principle of beauty. Regularity, according to this author, expreſſes beauty chiefly, if not ſolely, on account of its ſuggeſting the idea of fitneſs, propriety, and uſe, which have always a greater connection with orderly and proportioned forms, than with thoſe which appear not conſtructed according to any certain rule. Nature, the moſt graceful artiſt, hath, in all her ornamental works, purſued variety with an apparent neglect of regularity. Mr. Hogarth, in his "Analyſis of Beauty," publiſhed about the year 1753, enumerates, as elements of beauty, *fitneſs*, *variety*, *uniformity*, *ſimplicity*, *intricacy*, and *quantity*; and he obſerves, that figures bounded by curve lines are, in general, more beautiful than thoſe bounded by ſtraight lines and angles. The beauty of figure principally depends, in his opinion, upon two lines which he has ſelected. One of them is the "waving line," ſomewhat in the form of the letter S: and this he calls the "line of beauty," which is found in ſhells, flowers, and ſuch other ornamental works of nature, and is alſo common in the figures deſigned by painters and ſculptors for the purpoſe of decoration. The other line, which he calls the "line of grace," is the former waving curve, twiſted round ſome ſolid body, and exhibited in twiſted pillars and twiſted horns, and in the curling worm of a common jack. Variety plainly appears, in the inſtances which he mentions, to be ſo material a principle of beauty, that he defines the art of drawing pleaſing forms to be the art of varying well; and, according to him, the curve line, which is ſo much the favourite of painters, derives its chief advantage from its perpetual bending and variation from the ſtiff regularity of the ſtraight line. *Motion*, ſays Dr. Blair, furniſhes another ſource of beauty, diſtinct from figure; being of itſelf pleaſing, ſo that bodies in motion are, "cæteris paribus," preferred to thoſe at reſt. But the quality of beautiful belongs to gentle motion, ſuch as that of a bird gliding through the air, and that of a ſmooth running ſtream. In general, motion in a ſtraight line is leſs beautiful than that in an undulating direction; and motion upwards is alſo commonly more agreeable than motion downwards. The eaſy curling motion of flame and ſmoke is an object ſingularly pleaſing, and exhibits an inſtance of Mr. Hogarth's waving line of beauty. This artiſt obſerves, that, as all the common and neceſſary motions for the buſineſs of life are performed in ſtraight or plain lines, all the graceful and ornamental movements are made in waving lines. Dr. Beattie, in his "Diſſertations Moral and Critical," has introduced, in his digreſſion on beauty, ſome ingenious remarks on this ſubject. After obſerving that cuſtom has a perpetual influence in determining

terminating our notions of beauty, he proceeds to prove, that from associations founded on habit, many, or perhaps most of those pleasing emotions are derived, which accompany the perception of what in things visible is called beauty. With regard to the beauty or awkwardness of motion, he observes, that the one will be found to please, and the other to displease, chiefly on account of certain disagreeable ideas suggested by the former, and of certain disagreeable ones associated with the latter. Motions, that imply ease, with such an arrangement and proportion of parts in the moving object, as may give reason to expect its continuance without injury, are generally pleasing, at least in animals, especially when they betoken a sort of perfection suited to the nature of the animal. But motions, that betray infirmity, unwieldiness, imperfection, or the appearance of danger, cannot be called beautiful, because they convey unpleasing ideas. These observations are illustrated by a variety of apposite instances. Cicero (de Off. l. i. § 36.) blames every motion that alters the countenance, quickens the breath, or betrays any discomposure. Rousseau observes, that in running, a woman is destitute of that grace which attends her on other occasions. Perhaps, says Beattie, the jutting out of her elbows, the natural effect of her endeavouring with lifted hands to secure the most delicate part of the human frame, may give to her motion the appearance of timidity and constraint. Or, perhaps, she may fail in this exercise, merely because, according to our manners, she cannot be much accustomed to it. See DANCING.

It is not easy to convey, in so few words, so many charming ideas of beauty, in its several varieties of colour, shape, attitude, and motion, as Gray has combined in the following image:

"Slow melting strains their queen's approach declare;
Where'er she turns the graces homage pay:
With arms sublime that float upon the air,
In gliding state she wins her easy way:
O'er her warm cheek, and rising bosom move
The bloom of young desire, and purple light of love."

But to return from this digression. Dr. Blair observes, that though colour, figure, and motion, be separate principles of beauty; yet in many beautiful objects they all meet, and render the beauty both greater, and more complex. Thus, in flowers, trees, animals, we are entertained at once with the delicacy of the colour, with the gracefulness of figure, and sometimes also with the motion of the object. Perhaps, the most complete assemblage of beautiful objects is presented by a rich natural landscape, composed of a sufficient variety of objects; fields in verdure, scattered trees and flowers, running water, animals grazing; to which may be added some productions of art, which suit such a scene, as a bridge with arches over a river, smoke rising from cottages in the midst of trees, and the distant view of a fine building, seen by the rising sun.

The beauty of the human countenance is more complex than any which has yet been considered. It includes the beauty of colour, arising from the delicate shades of the complexion; and the beauty of figure, arising from the lines which form the different features of the face. But its chief beauty depends upon a mysterious expression which it conveys of the qualities of the mind; of good sense, or good humour; of sprightliness, candour, benevolence, sensibility, or other amiable dispositions.

Another distinct species of beauty arises from design or art, or from the perception of means being adapted to an end; or the parts of any thing being well fitted to answer the design of the whole. This is altogether different from the perception of beauty produced by colour, figure, variety, or any of the causes already mentioned. This sense of beauty in fitness and design, has an extensive influence over many of our ideas. It is the foundation of the beauty which we discover in the proportion of doors, windows, arches, pillars, and all the orders of architecture. We shall here observe, that Mr. Perrault distinguishes two kinds of beauty in architecture. The one he calls "positive," and "convincing," such as the richness of the materials; grandeur of the structure, neatness of the workmanship, symmetry, &c.; the other he calls "arbitrary," which depends on the will, and which would admit of having their proportions changed without deformity. These only please by the connection or association of their ideas with others of a different kind, which please of themselves: they owe their beauty to that prepossession of the mind, by which a thing, whose value we do know, insinuates an esteem for others which we do not know. Thus, he observes, there are many things in architecture, which reason and good sense would judge deformed, which, however, custom has not only made tolerable, but even beautiful, by their being always joined with other beauties that are positive. Being at first pleased with viewing them in company, and merely on that account, we at length become pleased with them alone; and thus we frequently become fond of faults, and fall in love with deformity. Our sense of fitness and design holds so high a rank among our perceptions as to regulate, in a great degree, our other ideas of beauty. In an epic poem, a history, an oration, or any work of genius, we always require, as in other works, a fitness, or adjustment of means, to the end which the author is supposed to have in view.

Beauty, as it is applied to writing or discourse, denotes all that pleases, either in style or sentiment, from whatever principle that pleasure flows; and a beautiful poem or oration means, in common language, no other than a good one, or one well composed. Beauty, besides this indefinite sense of it, is also used to signify a certain grace and amenity in the turn either of style or sentiment, for which some authors have been peculiarly distinguished. In this sense it denotes a manner neither remarkably sublime, nor vehemently passionate, nor uncommonly sparkling; but such as excites in the reader an emotion of the gentle placid kind, similar to what is excited by the contemplation of beautiful objects in nature, which diffuses over the imagination an agreeable and pleasing serenity. Addison was eminently a writer of this character; and it belongs also to Fenelon, the author of the Adventures of Telemachus. Virgil, among the ancients, is distinguished, in his general manner, by beauty and grace, rather than sublimity. Among orators, Cicero has more of the beautiful than Demosthenes, whose genius led him wholly towards vehemence and strength.

The ingenious Mr. Burke, in his "Philosophical Inquiry into the Origin of our Ideas of the Sublime and Beautiful," excludes from the number of real causes of beauty, the proportion of parts, fitness, or that idea of utility which consists in a part's being well adapted to answer its end, and also perfection; and he observes (p. 210.) that beauty is, for the greater part, some quality in bodies, acting mechanically upon the human mind by the intervention of the senses. The qualities of beauty, as they are merely sensible qualities, which he enumerates, are the following: they should be comparatively small, smooth, various in the direction of their constituent parts; these parts should not be angular, but melted, as it were, into each other; they should be of a delicate frame, without any remarkable appearance of strength; the colours should be clear and bright, but not very strong and glaring; and any glaring colour that is introduced should be diversified with others. These are the seven properties upon which, according to this author, beauty depends; properties that operate by nature, and are less liable to be altered by caprice, or confounded by a diversity of tastes, than any others. The physiognomy also, says Mr. Burke, has a considerable share in beauty, especially in that of our own

pecies. The manners give a certain determination to the countenance, which being obſerved to correſpond pretty regularly with them, is capable of joining the effects of certain agreeable qualities of the mind to thoſe of the body. So that to form a finiſhed human beauty, and to give it its full influence, the face muſt be expreſſive of ſuch gentle and amiable qualities as correſpond with the ſoftneſs, ſmoothneſs, and delicacy of the outward form. For Mr. Burke's mode of illuſtrating and confirming his theory of beauty, the reader is referred to his work above cited.

Dr. Sayers, in his "Diſquiſitions, metaphyſical and literary," 8vo. in 1793, has given a new analyſis of beauty, conducted on the principles which were applied by Dr. Prieſtley in his "Lectures on Oratory and Criticiſm," and by Mr. Alliſon in his "Eſſays on Taſte," to the explanation of the intellectual pleaſures, namely, the doctrines of the Hartleyan ſchool His argument, ſummed up in a few words, is as follows: that individual of a claſs of objects is juſtly to be eſteemed more beautiful than the reſt, with the whole of which, or with its component parts (when properly underſtood), the greater number of the excellencies of its claſs are univerſally aſſociated. The ſame may be aſſerted of any ſpecies of objects, when compared with any other ſpecies of its kind; and that object may be juſtly eſteemed a "ſtandard of beauty," with the whole appearance, or with the component parts of which (when properly underſtood), all the excellencies of its kind are "univerſally" aſſociated.

Beauty, in the *Arts of Deſign*. Whatever of beauty or perfection becomes an object of contemplation to our minds, whether it be purely mental or perceived through the medium of our ſenſes, muſt be derived from the beautiful and perfect itſelf, and may be traced back towards its Divine ſource. However diverſified, it proceeds from this ſource, and directs us where to ſeek the principles and perfection of all ſcience and art, of all things metaphyſical, phyſical, and moral, which by their mutual connection and harmony declare their common relation and origin; therefore what is called beauty in the arts of painting and ſculpture muſt be ſought for in its principles, metaphyſical, phyſical, and moral. In this reſearch we ſhould do well to take thoſe philoſophers for our guides, who were the oracles of Greece, in the times when painting and ſculpture attained their higheſt excellence. In the dialogue between Socrates and the ſculptor Clito (Xenophon's Memorabilia,) Socrates concludes "that ſtatuary muſt repreſent the actions of the ſoul by form." And in the former part of the ſame dialogue Parrhaſias and Socrates agree, that the good and evil qualities of the ſoul may be repreſented in the figures of man by painting. Plato, in his dialogues, reaſons to the ſame purpoſe, and declares, that the good and beautiful are one.

Ariſtotle (De Mor. l. iv. c. 7, t. iii. p. 49. De Poet. c. 7. t. ii. p. 658.) obſerves, that beauty is order in grandeur. Order ſuppoſes ſymmetry, fitneſs, and harmony; and in grandeur are compriſed ſimplicity, unity, and majeſty. However, in his catalogue of virtues and their families, as well as of the oppoſite vices and their families, Ariſtotle concurs with Plato in acknowledging the relation between beauty and goodneſs, evil and deformity. Indeed, it has been one of the great objects of philoſophy, through all the ancient ſchools, to trace and demonſtrate not only the likeneſs but the identity of beauty and goodneſs. Among the Platoniſts and the Pythagoreans, malignity was abandoned, goodneſs or the juſt, and intellect or wiſdom cultivated, becauſe by this means, man is elevated to a nearer approach to the divinity. Fortitude and temperance were the virtues of the ſtoics and early epicureans, becauſe the one raiſes man above common fears and wants, and the other gives him better health and enjoyment of his faculties. Theſe concluſions are convincing, and their illuſtrations may be drawn in great abundance from the hiſtory and condition of the human race. Does any one ſupply the wants of his fellow creatures, and raiſe them from diſtreſs to a ſtate of comfort? In performing theſe and ſuch good acts his expreſſion is ſo tender, and his manner ſo gentle, that all preſent ſympathize in his feelings, and love the benefactor. If any one ſhews a magnanimous contempt of danger in a good cauſe, or manfully reſiſts the temptation to an evil act, in ſo doing his features and manner expreſs dignity and fortitude, which inſpire the beholders, with awe and reſpect. We look with delight on the florid complexion of a perſon in high health, but with concern and diſguſt at a pallid colour and flaccid ſkin, becauſe they are ſigns of diſeaſe and decay. We are pleaſed to ſee a ſtout and well made perſon, becauſe ſuch a figure beſpeaks great ſtrength and agility. We are likewiſe pleaſed to ſee a more ſlender figure of agreeable and harmonious proportions, becauſe in it ſufficient ſtrength is united with varied elegance of attitude. Hence, as almoſt every circumſtance of our exiſtence furniſhes examples to the ſame purpoſe, might we not define the beauty of the human perſon in the following terms? "Goodneſs, or virtue and wiſdom, in a human form beſt ſuited to their expreſſions and exertions." It would be as abſurd as preſumptuous for us to attempt entering the councils of Infinite Wiſdom to diſcover why the figure of a man was made ſuch as it is and no other. We might as well enquire why ſuch a particular number of worlds were made in or out of our ſyſtem ſubject to ſuch laws of gravity, motion, and revolution? But taking man as he is, whether we conſider the faculties of his ſoul, the component parts of his body, or the combined operations of both, the mind is overwhelmed with the ſtupendous and wonderful ſtructure of the parts, and the harmony, beauty, and utility of the whole.

Whilſt we are conſidering beauty in the works of painting and ſculpture, it will be proper to remember that the word by which the Greeks expreſſed this quality was ΚΑΛΟΣ, fair, handſome, beautiful, which applied extenſively to almoſt any being or thing giving pleaſure in conſequence of its goodneſs. According, therefore, to this uſe of the term, we ſhall inveſtigate human beauty in both ſexes, and their ſeveral diſtinctions of character. The human figure is wonderfully ſuited to its various offices and employments, as well in its internal ſtructure as in its outward form. The mechanical powers, the geometrical figures, the motion and weight of fluids, and the operations of chemiſtry, are continually engaged in its ſupport and renewal; uniting an accumulation of force with a ſimplicity of operation truly wonderful, and contributing in their effects and appearances to the beauty of the outward form, which in the preſent inquiry is to be the object of attention. The head contains the brain, which ſends nerves to all parts of the body and limbs, and the organs of four ſenſes; this is the ſuperior member of the figure, and from its elevated ſtation, by means of the underſtanding and will, directs and determines the acts of all the inferior parts. The body, which contains in its cavity thoſe parts which ſupply the animal functions, is alſo a centre from which, and upon which, the five extremities act. The arms are ſupported on the body in a manner moſt favourable to all exertions of ſtrength, and with their hands are ſo formed, that theſe exertions may be alſo employed in the moſt difficult and curious labours. The legs ſtrongly ſupport the ſuperſtructure; when cloſed reſembling two pillars, when extended, like the triangular arch, and when neceſſary, ſwiftly conveying the perſon from place to place. It is proper to make theſe general remarks, becauſe, as we proceed, we ſhall find how diſtinguiſhing an ingredient utility is in the compoſition of beauty. After this ſlight view of the advantageous complication of powers and ſimplicity of operation in the human form, let us conſider its beautiful effect, animated by goodneſs, and informed by wiſdom; and as what has been ſaid in this part of the article relates to the arts of

deſign,

design, we shall produce illustrations from the antique sculpture and painting.—The ancients assigned the first class of beauty to the superior divinities, the second to heroes, and the third to fauns. Other divinities and genii seem to have partaken more or less of these classes. Mere portraits cannot be enumerated in either, because they are but faithful representations of ordinary nature. Of the superior gods, the Saturnian family possess the rank of sublimity in the Καλος or beautiful. In the fine head of Jupiter (lately in the pope's museum, now in the national gallery at Paris,) the hair rises from the forehead, and descends in abundant flowing locks on each side of his face and neck to the shoulders; his forehead is muscular, expressive of great strength; his nose and cheeks are correspondent; his eyes and mouth express benevolence; his wise and serious brow, his placid countenance, and full beard, inspire reverence and awe. His figure is the *mightiest* of the superior gods. His right arm moderately raised with his thunderbolt, or leaning on his sceptre, presents the habitual act of governing the universe. Winkelman has judiciously remarked, that the Greek sculptors preserved the family resemblance in the Saturnian race, with as much exactness as if they had been real portraits; therefore Jupiter's brothers strongly partake of the same character, excepting that Neptune's countenance is more severe and his hair more disturbed. Pluto's hair hanging over his forehead gives a gloomy cast to his countenance, which is increased by his more open and starting eyes. Winkelman has observed, that something of the lion may be traced in the nose, forehead, and hair of Jupiter, which adds might and magnanimity to the benevolence, wisdom, and awful majesty of his character. In the youthful beauty of Apollo, Bacchus, and Mercury, the same benevolence and wisdom are expressed, modified by their peculiar characteristics and offices. Apollo is light and strong in his make; Bacchus more soft and luxurious, and Mercury more athletic. The peculiarity of Hercules is magnanimity and unconquerable strength. The heroes have a more simple character throughout, approaching nearer to common nature. The fauns may be placed in the lowest class of beauty expressed in the human figure. Although their persons are youthful, and rather handsome, their proportions are shorter than those of the classes abovementioned; and sometimes their muscles are turgid and tendinous, accommodated to their sylvan habits and activity; their rounded faces have a portion of rustic good nature; but their united eye-brows, eyes placed diagonally to the nose, small hollowed noses, and grinning mouths, express some mixture of savage, servile, and mischievous dispositions. The most engaging and captivating species of beauty exists in the female sex; and was represented in perfection by the Greeks in their superior classes of statues. The large eye and full under lip of Juno, give an air of haughtiness to her countenance; her limbs are round and her figure is majestic. Minerva's figure partakes of Juno's majesty; but her face is not so full, and has an expression of abstracted wisdom. Venus is represented as an assemblage of female charms; her form is delicate, perfect, and elegant in the highest degree; her motion graceful, and her countenance expressive of love and sweetness.

The beautiful heads of antiquity are oval in the front view; in profile, the low forehead and nose form nearly one straight line; the lips are rather full and the chin rounded. Juno has the largest eye of the goddesses, according to Homer's epithet of "Ox-eyed;" the neck is rounded like a column; the chest is high and expanded; in the male subject the abdomen is flat; and, as Winkelman remarks, "such as it appears after sound sleep and good digestion;" the arms, descending from full shoulders, are tapered downwards to the wrist with a very gentle flattened hollow towards the inner elbow, to distinguish the bend of the arm; the back of the hand is one mass; the fingers rather long and tapered, with knuckles indicated in a manner almost imperceptible; the lower limb tapers more sensibly than the arm, because the thigh is larger in its commencement; the knee-pan in youthful statues is nearly oval; and the inner side of the tibia, or principal bone of the leg, is perceptibly marked by a curve of about 30 degrees; the great toe is large, and divided by a considerable space from the lesser toes, which are straight, and not bent over each other like such as have been confined in shoes.

In the female form, the limbs are more round and delicate: the knuckles of the hand and foot are expressed by slight dimples; the fingers are more tapered; and their outline determined by a long curve, a little reversed towards the end. The principal difference of relative proportions is, that the female figure should be about one face shorter than the male; each having eight heads in height. The female figure is also narrower in the shoulders and loins, and somewhat broader from the os pubis to the extremities of the nates. The Greeks represented the goddesses with virgin bosoms. Winkelman, in his "Monumenti inediti," has treated largely on the beauty of the antique statues. Professor Camper, in his "Principles of Design," has also given excellent observations and rules on the beauty and proportions of the human head and figure, absolute as well as comparative. For his account of beauty, as exhibited in ancient sculpture and engravings, see his treatise, entitled "Verhandeling over het natuurlyk verschilder wezenstrikken," &c. or, on the natural difference of features in persons of various countries and ages, published by his son, at Utrecht, 1792, 4to. In his dissertation on the beauty of forms, subjoined to his "Lectures," published by his son at the same place and in the same year, entitled "Roden Voeringen," &c. it is his object to prove, that no particular form can, abstractedly considered, constitute beauty; that the real basis of beauty consists in the means being adapted to the end; and that, exclusively of this, our ideas are influenced by customs, national prejudices, implicit confidence in the taste and opinions of others, &c.

Proportion is an essential quality of beauty in the human form; and striking coincidences are afforded in its relation to perfect geometrical figures, and the harmony of sounds and numbers. A man, standing upright, can stretch out his arms to a length equal to his height; consequently his figure may be included in a square; by stretching the arms not so much, and the legs a little, the figure may be contained in a circle, whose centre is the top of the os pubis. The ancients divided the height of the human figure into eight heads, and the face into three parts; five of these parts are the breadth of the loins; three parts, or noses, measure the upper part of the thigh; two, the calf of the leg, and one, the ankle. A well proportioned figure measures three equal parts from the top of the shoulder to the spine of the ilium next the rectus abdominis; from thence to the top of the knee-pan; and from thence to the bottom of the inner ankle.

The term grace, as a quality of beauty, however it may have puzzled the moderns in its definition and application, was clearly understood by the ancients. The graces or gratiæ of the Romans were the charities of the Greeks. ΧΑΡΙΣ, is grace, beauty, fairness, endearing, agreeable, elegant; and the groupes, gems, &c. are comments which are satisfactory and convincing. The graces are three beautiful sisters, whose innocence is their only garment, embracing each other in the gentlest manner. The Greek Christians have preserved the ancient signification of this word in its application to all those endearing duties which preserve happiness to, and bestow it on others; nor is it surprising, that these characteristics are given to women, because all the milder and endearing virtues are still more amiable

amiable in the female ſex. If by grace, the ſucceſſion and variation of undulating lines be intended, it is ſeen moſt perfectly in an elegant female figure moving ſlowly. It is remarkable, that man, of all creatures, preſents the moſt perfect view of his figure in front. Quadrupeds, birds, and fiſhes, are beſt ſeen in profile, and we look on the backs of reptiles and inſects. It is neceſſary, to the moſt advantageous appearance of man, that we ſhould contemplate the affections of his heart, and operations of his reaſon continually beaming in his countenance; the waving lines of his body, moving on the centre of gravity, and varied curves and angles formed by his limbs, perfect the whole of his figure, with an union of faculties mental and bodily, which reminds us that "God created Man in his own Image."

The various heads touched upon in the latter part of this article, will be treated of in the ſeveral articles of PAINTING and SCULPTURE.

We cannot forbear ſubjoining the reflection with which Mr. Thomſon, (a late writer on the ſubject of beauty) cloſes his detail of the various beauties of the female form. "If we ſhould ſee a perſon employ himſelf with a ſledge hammer to daſh the enchanting form of the Venus de Medicis to pieces, break her lovely limbs, and deface her beauteous features, we ſhould not heſitate a moment to pronounce him a ſavage barbarian, without taſte, feeling, or ſentiment, though his frenzy was employed only on a ſenſeleſs piece of ſtone; what then muſt we think of the diabolical ſavage, who exerciſes the worſt of all cruelties (becauſe the moſt laſting and affecting both to body and mind,) on the moſt beautiful and amiable of all creatures on this ſide heaven?—made expreſsly for his happineſs, ſolace, and delight, by firſt corrupting and betraying her, and then baſely abandoning her to periſh with want, pain, wretchedneſs, and miſery." The ſentiments of mankind, with regard to female beauty, have been very various in different ages and nations; and it is not poſſible to eſtabliſh a ſtandard which ſhall comprehend all, without diſcrimination; among the ancients, a ſmall forehead and joined eye-brows were charming features in a female countenance; and, in Perſia, large joined eye-brows are highly eſteemed. In ſome Indian countries, black teeth and white hair are neceſſary ingredients in the character of a beauty; and in the Marian Iſlands, it is a capital object with ladies to blacken their teeth with herbs, and to bleach their hair with certain liquors. Beauty, in China and Japan, is compoſed of a large countenance, ſmall, and half-concealed eyes, a broad noſe, minute feet, and a prominent belly. Some Indians of America and Aſia, compreſs the heads of their children between two wooden planks, with a view to enlarge and beautify the face; others compreſs them laterally, others depreſs the crown only, and others make the head as round as poſſible. Every nation has ideas of beauty peculiar to itſelf; and almoſt every individual has his own notions and taſte concerning this quality. The empire of beauty, however, amidſt theſe diſcordant ideas, with reſpect to the qualities in which it conſiſts, has been very generally acknowledged, and particularly in all civilized countries; and when it is united with other accompliſhments that tend to render females amiable, it contributes in no ſmall degree to give them importance and influence, to poliſh the manners of ſociety, and to contribute to its order and happineſs.

BEAUVAIS, BELLOVACUM, and CÆSAROMAGUS, in *Geography*, a city of France, and capital of the department of the Oiſe, ſeated on the Therin; and, before the revolution, the capital of the Beauvaiſis, and the ſee of a biſhop. The architecture of the cathedral has been much admired, beſides which it has ſeveral collegiate and pariſh churches. The manufacture of the city is a beautiful tapeſtry, which has ſupplied a conſiderable branch of trade. It has alſo produced great quantities of ſerge and woollen cloth. This city was unſucceſsfully beſieged by the Engliſh in 1443 and by the duke of Burgundy in 1472, at the head of 80,000 men. On the latter occaſion, the women diſplayed ſingular courage under the conduct of Jane de Hatchett, whoſe portrait is preſerved in the town houſe; and in commemoration of their brave defence, the women form the firſt rank of a proceſſion, obſerved annually on the 10th of July. This place contains in its N.E. and S.E. diſtricts 13,000, and in its two cantons 19,390 inhabitants, on a territory of 22½ kiliometres. Its N.E. canton includes 7 and its S.E. canton has 4 communes. N. lat. 49° 26′. E. long. 2° 15′.

BEAUVAISIS, a ſmall fertile diſtrict of France, bordered on the north by Picardy, on the weſt by Vexin-Normand, on the ſouth by Vexin-François, and on the eaſt by Senlis; now forming a part of the department of Oiſe. See BEAUVAIS.

BEAUVAL, a town of France, in the department of the Somme, and chief place of a canton, in the diſtrict of Doulens, one league S. of Doulens.

BEAUVERAY, a little town of France, in the diſtrict called, before the revolution, Autunois, in the department of the Saône and Loire, ſeated at the foot of a mountain, and ſuppoſed by ſome to be the ancient *Bibracte*.

BEAUVILLE, a town of France, in the department of the Lot and Garonne, and chief place of a canton, in the diſtrict of Agen, 3½ leagues N. of Valence. The place contains 1794, and the canton 7672 inhabitants; the territory includes 122½ kiliometres and 11 communes. N. lat. 44° 17′. E. long. 0° 47′.

BEAUVOIR, a town of France, in the department of Vendée, a chief place of a canton, in the diſtrict of Les Sables d'Olonne; the place contains 1892 and the canton 8537 inhabitants: the territory includes 230 kiliometres and 5 communes.—Alſo, a town of France, in the department of the Iſere, and diſtrict of St. Marcelin, 5 leagues S. W. of Grenoble.

BEAUVOIR *ſur Niort*, a town of France, in the department of the two Sevres, and chief place of a canton, in the diſtrict of Niort, 2½ leagues S. of Niort. The place contains 301 and the canton 5133 inhabitants; the territory includes 157½ kiliometres and 13 communes.

BEAUVOISIN, PONT DE, a town of France, in the department of the Iſere, and chief place of a canton, in the diſtrict of La Tour du Pin, on the borders of Savoy, 11 miles W. of Chambery. It is ſeated on the ſmall river Guier le Vif, which runs through it, and divides it into two parts.

BEAUZAT, a town of France, in the department of the Rhone and Loire, 1½ league S.W. of Moniſtrol.

BEAUZE'E, a town of France, in the department of the Meuſe, and chief place of a canton, in the diſtrict of Verdun, 4½ leagues S.S.W. of Verdun.

BEAUZELEY DE LEVEVOU, St. a town of France, in the department of Aveiron, and chief place of a canton, in the diſtrict of Milhaud, 2 leagues N.W. of Milhaud.

BEBE', a large village of Egypt, on the weſt ſide of the Nile, diſtant about 3 leagues from Beniſouef; the reſidence of a kiaſchef, and the ſite of a moſque, and a convent of Copts.

BEBELINGUEN, a town of Germany, in the duchy of Wurtemberg, ſeated on a lake from which proceeds the river Worm. N. Lat. 48° 45′. E. long. 9° 8′.

BEBENHAUSEN, a convent in the diſtrict of Wurtemburg, called Schonluck, at a ſmall diſtance N. E. of Tubingen; the manor of which contains 9 pariſhes. In this convent is an academy, where ſtudents are qualified for admiſſion into the ſeminary at Tubingen.

BEBENOWA, a town of Poland, in the palatinate of Braclaw, 14 miles S.E. of Braclaw.

BEBERACI, in *Ancient Geography*, *Katcunich*, a lake of Meſopo-

Mesopotamia, between mount Singara, and the river Chaboras.

BEBRT, in *Geography*, a river of France, which runs into the Loire, opposite to Bourbon Lancy.

BEBRYCES, in *Ancient Geography*, the first inhabitants of Bithynia. The origin of these people, and the reason of their name, are uncertain. A people of this appellation, mentioned by Silius Italicus, (l. iii. v. 420.) inhabited that part of Gallia Narbonnensis, which was situated between Spain and the Volcæ, or near the Pyrenées, and from them called *Bebricia*.

BEC, Le, in *Geography*, a town of France, in the department of the Eure, 9 leagues W.S.W. of Rouen.

BEC Crespin, a town of France, in the department of the Lower Seine, 3 leagues east from Havre.

BECABUNGA, Brooklime, in *Botany*. See Veronica.

BECAH, or Bekah, a Jewish coin, being half a shekel. In Dr. Arbuthnot's table of reductions, the bekah amounts to 13 $\frac{11}{65}$ *d.*; in Dr. Prideaux's computation to 1*s.* 6*d.*

Every Israelite paid a hundred bekahs a head every year for the support of the temple. Calmet.

BECALMING, in the *Sea Language*, is when any thing keeps the wind off or away from the vessel.

Thus one ship is said to becalm another, when she comes up with her on the weather-side: the like is said of the shore, when it keeps the wind away. A ship is likewise said to be becalmed, when there is no wind stirring.

BECANER, in *Geography*, a town of Hindoostan, seated on the Ganges, nearly east of Dehli.

BECARDE, in *Ornithology*, a name under which Buffon describes some birds of the Linnæan genus Lanius: as for example, his *becarde* is *lanius cayanus*, Gmel. and *becarde à ventre jaune*, *lanius sulphuratus* of the same author.

BE'CASSE, Be'cassine, a generical term in Buffon's Nat. Hist. for some birds of the Scolopax genus, in the Linnæan system.

BE'CASSEAU *ou Cul-blanc*, is also a name given by Buffon to the *tringa ochropus* of Linnæus.

BECCA, in the *Materia Medica of the Ancients*, a name given to a fine kind of resin collected from the turpentine and mastich-trees of Greece and Syria, and mixed together for use. It was much esteemed formerly, and not only used in the country where it was produced, but carried in great quantities to Mecca, and other parts of the Turkish dominions, where it was valued at a very great rate.

BECCABUNGÆ, in *Entomology*, a species of Curculio, of a black colour; wing-cases rufous; entirely bordered with black. Fabricius. In size and appearance it resembles *curculio cerasi*; inhabits Sweden; feeds on the *beccabunga*.

BECCADELLI, Antonio, in *Biography*, called *Antony* of *Palermo*, from the place of his birth; was born in 1374, studied the law at Bologna, and entered into the service of the duke of Milan, who allowed him an honourable pension. He also became professor of belles lettres and rhetoric in the university of Pavia, and, in 1432, was honoured by the emperor Sigismund, with the poetic laurel. When Alphonso king of Naples left Milan in 1435, he took Antonio with him to his court; and from this time, he became the inseparable companion of this prince, who conferred upon him many honours and gifts, and intrusted him with many important commissions. In 1451 he was deputed to solicit of the state of Venice, the supposed arm-bones of the historian Livy, which he obtained. Such indeed was his veneration for Livy, that he is said to have sold a farm in order to purchase a copy of Livy, written by the hand of Poggio the Florentine. After the death of Alphonso, Antonio became the secretary and counsellor of his son and successor Ferdinand. He died at Naples in 1471: leaving behind him ample testimonials of his talents as a Latin writer, both in prose and verse. For his work "De Dictis et factis Alphonsi regis Arragonum," he received the recompence of a thousand gold crowns; which work has been frequently reprinted, with additions. A collection of five books of his epistles, two harangues, and some verses, was printed at Venice in 1453. His "Hermaphroditus," which was a collection of short poems in two books, excited by its obscenity loud clamours against its author; and was publicly burnt in several cities of Italy, together with the writer's own effigy. Gen. Biog.

Beccadelli, Ludovico, was born of a noble family at Bologna in 1502, studied at Padua, and accompanied cardinal Pole in his legation to Spain. He assisted at the council of Trent, and was delegated by the papal court to Venice and Augsburg. In recompence of his services, he was promoted to the archbishopric of Ragusa; but being appointed in 1563 to superintend the education of the son of Cosmo I., grand duke of Tuscany, and expecting the archbishopric of Pisa, he renounced that of Ragusa. His expectations, however, were disappointed; and he was obliged to content himself with the provostship of the cathedral of Prato, in which office he died in 1572. He was reckoned eminent as a man of Letters, and wrote in Latin the lives of the cardinals Bembo and Pole, and in Italian a life of Petrarch, esteemed more correct than any other. Nouv. Dict. Hist.

BECCAFICO Canapino, in *Ornithology*, a name of *motacilla curruca*, in Olina.

Beccafico, and *Becfique*, are also names given by Olina and Buffon to *motacilla ficedula*. Linn.

BECCAFUMI, Domenico, in *Biography*, called *Micarino* and *Mecherino*, was the son of a peasant near Sienna, whose name was Pacio, born in 1484, and employed by his father in keeping sheep. Beccafumi, a citizen of Sienna, whose name he assumed, being prepossessed with a favourable opinion of his talents by observing figures which he drew, with his stick upon the sand, whilst he was surrounded by his flock, took him under his patronage, and placed him under the instruction of a painter, called Cavanna; and after having been, as some say, the disciple of Pietro Perugino, or according to others, after having been employed in copying the pictures of this artist, he went to Rome, and made further improvement by studying the works of Raphael and Michael Angelo. After two years he returned to Sienna, and finished several pieces, not only in oil, but in distemper and fresco, which gained him great reputation. But he was chiefly admired for his performance on the pavement of the great church, which he wrought by combining stones of different colours, with pitch poured in holes for the dark shades, in such a manner as the light and shadow of the object required. This kind of performance is said to have been invented by one Duccio of Sienna in 1356; but it was brought to perfection by Beccafumi: He had a fine invention; his taste was elegant; his expression good; and his colouring beautiful. He was also an excellent engraver on wood and metal, and also a founder. His usual mark on his plates is a B divided in the middle by a horizontal line. This artist died at Genoa in 1549. Pilkington and Strutt.

BECCARIA, Cæsar Bonesana, marquis of, an eminent Italian writer, was born about the year 1720. To the study of philosophy he was attached from his infancy, and he availed himself of the light and intellectual freedom, which about his time found their way into Italy from France, England, and other countries. At Naples Genovesi taught the Italians how to *think*, and Beccaria distinguished him by the title of "his learned and venerable master." At Milan also count Firmian was a distinguished patron of literature and science, and a promoter of every reform, that had philanthropy for its basis. With such enlightened men Beccaria co-operated by writing in 1767 his

his famous work, "On Crimes and Punishments," which had an extensive spread, and produced a great change in the prevailing ideas on these subjects. Voltaire, in his commentaries on this work, says, that this short treatise is in morals what a simple drug would be in medicine, which should be adequate to the cure of every disease to which the human body is liable. As the principles of government indirectly supported in this work were hostile to absolute power, they incurred the charge of subverting the legitimate sources of authority; and the marquis owed his protection to the influence of count Firmian. Having escaped the danger that threatened him, he diverted his attention from speculations of this nature to metaphysical subjects. Besides some papers, contributed to a periodical work, entitled "The Coffee-House," he published "Disquisitions on the Nature of Style," maintaining that by nature all men possess an equal degree of genius for poetry and elocution, and by the observance of proper rules all would be able to write equally well. Beccaria was much attached to men of letters, a patron to those who needed encouragement, and a cordial friend. He was charged, however, with venality in the exercise of an office of magistracy which he held; and hence his enemies compared him to lord Bacon, with respect both to abilities and corruption. He died November 1794. Month. Mag. 1798. Gen. Biog.

Beccaria, Giambattista, an eminent philosopher of the eighteenth century, and a monk of the Ecoles-Pies, was a native of Mendovi in Piedmont, and became professor of philosophy and mathematics, first at Palermo, and then at Rome. His established reputation occasioned his removal to Turin, where he occupied the chair of experimental philosophy. In consequence of his appointment to the office of preceptor to the princes of Sardinia, he was introduced to the Sardinian court; but neither this employment, nor the honour connected with it, diverted him from the indefatigable prosecution of his studies; and the pecuniary advantages that resulted from the appointment were principally devoted to the increase of his library and the improvement of his philosophical apparatus. Amidst the variety of his philosophical pursuits, his attention was particularly engaged by experiments and investigations in electricity; and in this department of science he acquired singular reputation. For an account of his principal discoveries and observations, see Atmosphere, and Electricity. His chief works on this subject were "Dell' Elettricismo Artificiale et Naturale," Turin 1753, 4to.; of which an English translation was published, in 1776, 4to. and "Lettere dell' Elettricismo," Bologn. 1758, fol. He also published essays "On the cause of Storms and Tempests." "On the Meridian of Turin," and on other physical and astronomical subjects. Father Beccaria, no less respectable for his virtues than his knowledge, died at Turin in an advanced age, May 22, 1781. Nouv. Dict. Hist.

Beccaria, James Bartholomew, born at Bononia, in 1682, received the early part of his education among the Jesuits. Turning his mind to the study of natural philosophy he soon became distinguished for the variety and depth of his knowledge in physics, and in mathematics, of which he was made public professor, and, in conjunction with Morgagni, and other celebrated characters at Bononia, assisted in forming an academy there for teaching mathematics, natural history, chemistry, anatomy, and medicine. He first gave lectures in natural history, and in 1712, was appointed to the chair of medicine, which he also now practised with great success. On the death of Valsalva, he was made president of the institution, and in that post introduced many useful regulations for the government of the academy, which are still continued. He was a frequent correspondent with the Royal Society of London, of which he was made an honorary member. Among other communications from Beccaria, which appear in the Philosophical Transactions, are his "Observations on the Weather," "On the Ignis Fatuus," and "On the power some persons have enjoyed of supporting life for a great length of time, without food." This was afterwards published at Padua, under the title of "De jejuniis longis Dissertatio," fol. 1748. He died Jan. 1766, being 84 years of age. Among his publications are, "Dissertatio Meteorologica Medica, in qua aeris temperies et morbi Bononiæ grassantes annis, 1729, et sequenti, describuntur." "De quamplurimis phosphoris nunc primum detectis, Commentarius," Bonon, 4to. 1744. "Scriptura Medico-legalis," 1749. For the titles of his other compositions, and of numerous unedited pieces, see Gen. Biog. and Hal. Bib. Anat.

BECCLES, in *Geography*, is a market and corporate town of Suffolk, in England, situated on the northern border of that county joining to Norfolk. It is fifteen miles S.W. of Yarmouth, and 108 N.E. from London. Though not a borough town, Beccles has its corporation, consisting of a portreeve, and thirty-six other persons, who are distinguished by the names of *twelves*, and *twenty-fours*. From the twelves, the officer called portreeve is annually elected. The town consists of several streets, which concentrate in a spacious area, where the markets are held every Saturday. Here are a large handsome church, whose tower is detached from it, and the ruins of another called Ingate church, which was formerly the parish church. The church-yard, from its elevated situation, commands many fine and extended views of the adjacent country, and the meandrings of the river Waveney which adjoins this cemetery. Here are a town-hall and gaol; the former is a substantial building, where the quarter sessions are held; and the latter has been lately much enlarged and improved conformably to the Howardian plan. A public grammar school was founded here in 1712, by Dr. Fauconberg, who endowed it with certain lands for the maintenance of a clergyman, and to qualify youth for the university. Sir John Leman, knight, also founded a free English school in 1631, for the education of forty-eight boys; also for a master and usher, who are appointed by trustees, being part of the corporation. On the north-west side of the town is a very large common field, containing nearly 1600 acres, where the inhabitants are allowed, under certain restrictions, to turn a number of horses and cattle. Beccles suffered by a destructive fire, which happened on the 29th of November, 1586, when more than 80 houses were consumed, with property calculated at 20,000*l.* value. It is rather a singular circumstance, that neither mail, nor turnpike roads, communicate with this town: though it was some time since proposed at a public meeting to carry the turnpike road to Yarmouth through this place; but the proposition was negatived by a considerable majority of the inhabitants. Here are three annual fairs. The number of houses in the township is 601; of inhabitants 2788, of which 1245 are males, and 1543 are females. In the vicinity of this town are the following, besides other gentlemen's seats. *Raveningham Hall*, sir Edmund Bacon, bart. —*Langley Park*, sir Thomas Beauchamp Proctor, bart.—*Benacre Hall*, sir Thomas Gooch, bart.—*Sotterly Hall*, Miles Barne, esq.

BEC-D'OISEAU, in *Zoology*, the name lately given by French naturalists to that most singular Australasian animal *Platypus anatinus* of Vivarium naturæ; and *Duck-billed platypus* of Dr. Shaw. It is also called *Ornithorhinchus paradoxus*, by M. Blumenbach of Goettingen. See Platypus.

BECEDE, La, in *Geography*, a small town of France on the Aude, and chief place of a canton, in the district of Castelnaudary, 1½ league north of Castelnaudary.

BECF-AAL, in *Ichthyology*, a French name of the *Electrical eel*, anguille electrique.

BECHAN, in *Geography*, a river of North Wales, which

which runs into the Severn, 3 miles W.S.W. of Montgomery.

BECHER, John Joachim, in *Biography*, an induſtrious and ſucceſsful cultivator and improver of chemiſtry, and an ingenious mechanift, was born at Spires in 1645. After paſſing through the uſual preliminary ſtudies, he was made profeſſor of medicine at Mentz, and ſoon after phyſician to the elector there, and to the elector of Bavaria. Acquiring conſiderable reputation in theſe honourable poſts, he was called to Vienna by the emperor Leopold; where, beſides attending to his medical duties, he was inſtrumental in forming a chamber of commerce, and in improving their manufactures. He is alſo ſaid to have projected the plan of an Eaſt India company there. But getting into diſputes with ſome of the officers about the court, he loſt his influence, and was obliged to leave Vienna. He then went to Mayenne, Munich, and Wurtzburg. From Wurtzburg he was driven away, Haller ſays, on being detected diſſecting an human body, with the view probably of proſecuting ſome chemical experiments on ſome of the humours, as he did not cultivate anatomy. At Haerlem, where he now went, he invented a machine for throwing ſilk; and, as he tells us in his "La folie ſage, et la ſolie fageſſe," printed at Francfort 1682, made ſome improvement in the art of printing; in what it conſiſted, is not however known. In the mean while he was not unmindful of the principal object of his ſtudies, the advancement of the knowledge of chemiſtry, as appears by a rapid ſucceſſion of publications on that ſubject. Getting again involved in diſputes with ſome principal perſons at Haerlem, and compelled to quit that place, he came to London, where he died in 1685. That he was of a turbulent and reſtleſs diſpoſition is evident by his frequent migrations, and by his conſtantly loſing the favour and protection of his patrons, whom he had made his debtors by his abilities and ſervices. Becher gave a new turn to chemiſtry, which he employed in analyſing and finding out the principles of natural bodies, and thence laid the foundation of the great improvements that have been made in that art. But he was fond of myſteries, and employed no ſmall part of his time and labour in his attempts to tranſmute metals. That he thought this practicable, appears by his "Experimentum chymicum novum, quo artificialis et inſtantanea metallorum generatio et tranſmutatio ad oculum demonſtratur;" and his "Theſes chymicæ, veritatem et poſſibilitatem tranſmutationis metallorum in aurum evincentes:" but he was conſcious of having done more in this art than had ever been done before, and therefore probably thought hardly any thing impoſſible. He had a project for an univerſal language, by which all men might make themſelves intelligible to each other: "Character pro omnibus linguarum univerſali." On this ſubject he publiſhed, in 1661, a Latin folio; and as he was the firſt perſon who gave a complete treatiſe on this art, ſince known under the name of paſigraphy, he may therefore be conſidered as the inventor. (*See Univerſal* Character, and Pasigraphy.) His principal works are his "Phyſica ſubterranea," which has paſſed through ſeveral editions; "Inſtitutiones chymicæ," Mogunt. 4to. 1662; "Parnaſſus medicinalis," Ulm. 1663, fol. For the titles of the reſt of his works, ſee Eloy's Dict. Hiſt.

BECHERE Gol, in *Geography*, a lake of Carmania, in Aſiatic Turkey, 40 miles W. of Cogni.

BECHERELLE, a town of France, in the department of the Ille and Vilaine, and chief place of a canton, in the diſtrict of Montfort, 3 leagues N. of Montfort. The place contains 493 and the canton 10,994 inhabitants; the territory includes 120 kilometres and 10 communes.

BECHHOFEN, a ſmall market town of Germany, in the principality of Onolzbach, ſeated on the river Wiſet, and having a ſmall caſtle.

BECHICS, formed of the Greek βηξ, βηχος, a *cough*, in the *Materia Medica*, medicines proper for relieving coughs, but theſe being of various kinds, the general term may miſlead, and is therefore improper.

Bechic *Pills*. See Pills.

BECHIN, in *Geography*, a town of Bohemia, and capital of a circle of the ſame name. It is ſeated on the river Luznice, and its citadel lies on a ſteep rock. The circle was miſerably ravaged and laid waſte in the 30 years' war, and the town was taken and burnt by general Bequoi in 1619. N. lat. 49° 14′. E. long. 15° 12′.

BECHTHEIM, a town of France, in the department of Mont-Tonnere, and chief place of a canton, in the diſtrict of Mayence. The place contains 1055 and the canton 13,135 inhabitants: it includes 21 communes.

BECHTOLSHEIM, a market town of Swabia, in the Rheniſh circle of nobility, belonging to four co-heirs, two of whom are Roman catholics, and two Lutherans.

BECK, a little river or brook, called alſo rivulet or rill.

According to Verſtegan, the original word is *beke*, which properly imports a ſmall ſtream of water iſſuing from ſome bourn or ſpring.

Hence, *hell-becks*, little brooks ſo called, on account of their ghaſtlineſs and depth, or rather from their being covered, or much concealed. See Hell.

Beck is chiefly uſed among us in the compoſition of names of places originally ſituate on rivulets; hence Welbeck, Bournbeck, &c.

The Germans uſe *beck* in the ſame manner.

Beck, David, in *Biography*, an eminent portrait painter, was born at Arnheim in Guelderland in 1621, and became a diſciple of Vandyck, from whom he acquired a fine manner of pencilling, and that ſweet ſtyle of colouring in which the maſter excelled, together with that rapidity of execution for which he was ſo famous. He was appointed portrait painter to Chriſtina queen of Sweden; and by her recommendation, moſt of the illuſtrious perſons in Europe ſat to him for their pictures. In his perſon and behaviour he was handſome, agreeable, and polite; and though he was much favoured by his royal miſtreſs, he wiſhed to viſit his friends in Holland, very much againſt the queen's inclination; but as he ſoon after died in Holland, at the early age of 35, it was ſuſpected that he was poiſoned. As he travelled through Germany, he was ſuddenly taken ill at an inn, where he lodged, and the illneſs terminated in his apparent death, ſo that he was laid out as a corpſe. His valets, who attended, regretted the event, and as they ſat by his bed-ſide, relieved their ſorrow by drinking freely. One of them, in a ſtate of intoxication, ſuggeſted, that their maſter was fond of a glaſs while he was alive, and propoſed to teſtify their gratitude by giving him a glaſs, though he were dead. Accordingly they raiſed his head, and endeavoured to put ſome liquor into his mouth. Upon this Beck opened his eyes, and the ſervant compelled him to ſwallow what remained in the glaſs. The painter revived, and, by due attention, not only eſcaped interment, but perfectly recovered. In teſtimony of his merit as an artiſt, he received from different princes many gold chains, and ſeveral medals of gold of a large ſize. Pilkington.

BECKEM, or Beckum, in *Geography*, a ſmall town of Germany, in the circle of Weſtphalia and biſhopric of Munſter, ſeated on the Weiſe, 17 miles S.S.E. of Munſter. In 1734 it was almoſt wholly conſumed by fire.

BECKER, Daniel, in *Biography*, was born at Dantzick, in December 1594. He took his degree of doctor in medicine at Konigſberg, and was made profeſſor of medicine there, and rector of the univerſity. Becker was author of various medical works, but that which principally contributed to preſerve his name, is his "De cultri toro Proſſico, obſervatio et curatio ſingularis," or the extraordinary cure of the Pruſſian

ſian knife-ſwallower; firſt publiſhed in 1636, and ſince frequently reprinted. The ſubject of the hiſtory is a young man, aged 22 years, who endeavoured to excite vomiting by introducing the handle of a knife, ten inches long, into the œſophagus; the knife ſlipping from his fingers, dropped into his ſtomach; whereit continued, occaſioning much pain, about ſix weeks. No probable means of relieving him, or of obtaining the diſcharge of the knife occurring, it was determined, by his medical attendants, to make an inciſion through the integuments of the abdomen into the ſtomach, and to extract the knife through the wound. The operation was performed, the knife taken out, and the patient recovered in a few days. The author relates ſeveral other caſes of perſons who had received wounds, penetrating into the ſtomach. In ſome, the wounds were completely healed; in others, the edges of the wounds becoming callous, left fiſtulous openings into the ſtomach, through which the food paſſed, unleſs when covered with a compreſs. This work was tranſlated into Engliſh, and publiſhed in 4to. by Dan. Lakin, in 1642, under the title of "A miraculous cure of the Pruſſian ſwallow knife." Lakin added other caſes of wounds penetrating into the ſtomach, which terminated in the ſame ways, as thoſe related by Becker. To both the Latin and Engliſh editions engravings of the ſubject are added. He died the 14th of October 1655. For the titles of his other works, none of which are of much eſtimation; ſee Haller's Bib. Chirurg. et Anatom. His ſon Daniel, who was educated under his father, after viſiting the principal ſchools on the continent of Europe, was made doctor of medicine at Straſbourg, in the year 1652; returning to Konigſberg, he was appointed profeſſor in ordinary, and ſoon after phyſician to the elector of Brandenburg. He died ſuddenly Feb. 6th 1670, and was ſucceeded in his honours by his ſon Daniel Chriſtopher, but they neither of them left any works deſerving notice.

Becker, Balthasar. See Bekker.

BECKET, Thomas, an Engliſh prelate, famous as the occaſion of much political contention during his life, and as the object of much ſuperſtitious veneration after his death, was born in London in 1119, and proſecuted his ſtudies at Oxford, Paris, Bologna, and Auxerre. During the interval of his reſidence at Paris and Bologna, he was introduced to Theobald archbiſhop of Canterbury, who, being captivated with his graceful and winning addreſs, gave him two livings in Kent, and obtained for him two prebends in the cathedrals of London and Lincoln. As at this time he was only in deacon's orders, he probably held theſe benefices by the pope's diſpenſation, which his patron might eaſily have procured. After his return from Auxerre, where he compleated his ſtudies, particularly in the civil and canon laws, he was employed by the archbiſhop as his agent to the pope, in order to ſolicit the reſtoration of the legantine powers to the ſee of Canterbury. Having conducted this negotiation with dexterity and ſucceſs, he was deputed on another important commiſſion, the object of which was to obtain from the pope thoſe prohibitory letters againſt the coronation of prince Euſtace, by which that deſign was defeated. Upon his return to England from this ſucceſsful embaſſy, the archbiſhop conferred upon him ſeveral new favours, appointing him provoſt of Beverley and dean of Haſtings, with the right of retaining his other benefices, and juſt before the death of Stephen, inveſting him with the archdeaconry of Canterbury. Immediately upon the acceſſion of Henry II. to the throne, in 1158, he was appointed chancellor of England at the requeſt of his patron, who thought no dignity or truſt above his merit. The chancellor of England, at this time, had no diſtinct court or judicature in which he preſided; but he acted together with the juſticiary and other great officers, in matters of the revenue, at the exchequer, and ſometimes in the counties upon circuits. The great ſeal being in his cuſtody, he ſuperviſed and ſealed the writs and precepts that iſſued in proceedings pending in the king's court, and in the exchequer. He alſo ſuperviſed all charters which were to be ſealed with that ſeal. In the council his rank was very high; and he had the principal direction and conduct of all foreign affairs, performing moſt of that buſineſs which is now done by the ſecretaries of ſtate. Such was the office to which Becket was raiſed; but the favour of his maſter made him greater than even the power of that office, great as it was in itſelf. In this ſtation he paid his court ſo ſucceſsfully to his royal maſter, not only by his dexterity in buſineſs, but alſo by his ſplendid manner of living and agreeable converſation, that he became his greateſt favourite, and his chief companion in his amuſements. Employments and truſts of all kinds were heaped upon him without meaſure or propriety. Beſides the office of chancellor, and a ſcandalous number of eccleſiaſtical benefices, he had royal caſtles and forts committed to his cuſtody, the temporalities of vacant prelacies, and the eſcheats of great baronies belonging to the crown. Theſe revenues he expended without account or controul; and Henry repoſed in him ſuch a degree of confidence, that he ſeemed almoſt to ſhare the throne with the ſovereign. It muſt indeed be allowed that Becket poſſeſſed in a pre-eminent degree all the qualities that could moſt powerfully engage the affections of a prince, who had a judgment capable of diſcerning, and a heart formed to love extraordinary merit, but a temper that required ſome delicacy of addreſs in thoſe who approached him very nearly, and that yielded moſt to thoſe friends whoſe character appeared moſt congenial to his own. The perſon of Becket was graceful and his countenance pleaſing; his wit was lively and facetious, his judgment acute, his eloquence flowing and ſweet, and his memory capacious and ready on all occaſions. The time he had paſſed in that ſchool of the moſt exquiſitive policy, the court of Rome, had greatly improved and refined his underſtanding. Nor was his capacity limited to the ſphere of buſineſs. He made himſelf the king's perpetual companion in moſt of his pleaſures, and conſulted his taſte ſo naturally, and with ſo much eaſe, that in paying his court he ſeemed only to indulge his own inclinations. He occaſionally laid aſide the eccleſiaſtical habit and character. In an expedition with the king to France, he aſſumed the military profeſſion, headed a body of men in his own pay, and commanded at various ſieges. In his manners there was a certain inexpreſſible grace derived from nature and improved by art, which rendered his virtues more amiable, and even his vices agreeable. Thus his profuſeneſs and oſtentation appeared like generoſity and greatneſs of ſpirit; nor indeed was he deſtitute of theſe qualities, though he carried them far beyond proper bounds. His expence was enormous, and Henry would have been jealous of it, as intended to acquire too much popularity, if he had not been perſuaded, by the addreſs of Becket, that all his magnificence, in which the ſon of a private citizen ſurpaſſed even the greateſt and moſt opulent earls, was only deſigned to do honour to his bountiful maſter, whoſe creature he was, and upon whom his whole fortune muſt abſolutely depend. Yet, amidſt the luxury in which he lived for ſeveral years, and all the temptations of a court where gallantry reigned, he was, if the writers of his life may be credited, conſtantly temperate and invincibly chaſte.

At the time of the death of archbiſhop Theobald, Becket's patron, the king, was in Normandy; but as ſoon as he heard of it, he reſolved to raiſe his chancellor to the primacy, in hopes by his means of governing the church in tranquillity. This advancement however was retarded for about a

year by the opposition of the empress Maud, the king's mother, and of the clergy and bishops of England. But Henry's resolution was fixed, and his fondness for his favourite overcame all remonstrances; so that Becket, being first ordained priest, was consecrated at Canterbury, June 6, 1162. As soon as Becket found himself firmly seated in the archiepiscopal chair of Canterbury, he suddenly changed his whole mode of life, and from being the gayest and most luxurious courtier, he became the most austere and solemn monk. Without the king's previous knowledge of his intention, and very much to his surprise and dissatisfaction, he resigned the office of chancellor. Before the king's return to England in 1163, he had received so many complaints of the severities of the new primate, that he became sensible, when it was too late, that he had made a wrong choice. In his interview with Becket at Southampton, it was observed by the whole court that his affection was cooled; and he soon after manifested his dissatisfaction with the conduct of the primate, by obliging him, much against his inclination, to resign the archdeaconry of Canterbury. In 1163, Becket attended a council, summoned at Tours by pope Alexander III., where he was treated by the pope and cardinals with particular respect; and where, it is probable, he was animated by the pope in his design of becoming the champion of the liberties of the church, and the immunities of the clergy. It is, however, certain, that soon after his return he began to prosecute this design without his former reserve; and the zeal which he manifested produced an open breach between him and his sovereign. Henry was determined to be the sovereign of all his subjects, clergy as well as laity; to oblige them to obey his laws, or to answer for their disobedience in his courts of justice. Becket, on the other hand, maintained, that the clergy were subject only to the laws of the church, and were to be judged only in spiritual courts, and to be punished only by ecclesiastical censures. In order to bring this question to a speedy issue, which the licentiousness of the clergy, and the atrocious crimes committed by some of them at this time, rendered absolutely necessary; a council of the clergy and nobility was summoned at Westminster; and at this council the king required that the archbishop and other bishops would consent to deliver to his officers a clerk, who was degraded for any crime, in order to his being punished for it according to the laws of the land. This request was reasonable; but the primate's influence resisted the demand; and the council broke up in confusion. Although Becket solemnly promised and swore, in the words of truth, and without reserve, to obey the laws and customs, commonly called the "constitutions of Clarendon," which reduced ecclesiastics of all denominations to a due subjection to the laws of their country, and restricted the immunities of the clergy; he soon began to exhibit signs of repentance, by extraordinary acts of mortification, and by discontinuing the performance of the sacred offices of his function; and he obtained from the pope a bull, releasing him from the obligation of his oath, and enjoining him to resume the duties of his sacred office. Fearful however of the king's indignation, he determined to retire privately out of the kingdom; but being prevented from making his escape by contrary winds, he returned to Canterbury; and afterwards waited upon the king at Woodstock, to supplicate forgiveness for attempting to leave the kingdom without his permission. The king received him without any other expression of displeasure, besides asking him, "if he had left England because he thought it too little to contain them both?" This interview was soon succeeded by fresh aggressions on the part of Becket, which induced the king to summon a parliament at Northampton, Oct. 17, 1164, which unanimously found the primate guilty of contumacy, in refusing to attend the king's court when he was summoned, and sentenced him to forfeit all his goods and chattels. He was also required to restore a sum of 500*l.* which the king had lent to him when he was chancellor, and to render an account of 250,000 marks, which he had received from vacant benefices. These demands were of so serious a nature, that, though he appealed to the pope, many of his episcopal brethren deserted him through fear, and urged him to resign his office, assuring him that if he did not he would be tried for perjury and high treason. The barons likewise became loud and vehement in their clamours against him, so that Becket thought it most prudent to leave the kingdom. Accordingly he left Northampton at midnight, accompanied only by two monks, and travelling on foot and by night, he arrived at Lincoln, and from thence he passed by water to a solitary island, where he remained till an opportunity offered of passing over to Flanders. Some say that he travelled to Sandwich, and hired a fishing boat to convey him to Boulogne. However that be, he retired to the monastery of Saint Bertin. Upon his retreat, the king confiscated the revenues of the archbishopric, and sent ambassadors to the king of France, and the earl of Flanders, dissuading these princes from affording Becket shelter in their dominions. The ambassadors met with a cold reception at the French court at Compeigne, and were told by Lewis, who was a superstitious bigot, and a great admirer of Becket, that he would protect the persecuted prelate with all his power. They then proceeded to Sens, where the pope resided, who, after admitting them to an audience, and consulting his cardinals, informed them, that no answer could be given to their petition till the archbishop had been heard. Becket, as soon as he was assured of the favour and protection of the king of France, paid him a visit at Soissons, where he was affectionately received, and urged to accept an order on the royal treasury for every thing he needed during his stay in France. From Soissons he proceeded with a numerous retinue for Sens, which he entered in a kind of triumph, and here the pope treated him with the greatest respect and kindness. At a solemn council of all the cardinals and prelates, he was seated at the pope's right hand, and allowed to keep his seat while he explained his cause. Having produced, in the course of an artful speech, a copy of the constitutions of Clarendon, several of which were directly calculated to abridge the power of the pope and cardinals, the whole assembly expressed their abhorrence of them in the strongest terms, and at the same time passing the highest encomiums on the archbishop, declared that his cause was the cause of God and the church, and that he ought to be supported. Becket, with a view of farther ingratiating himself with the pope, resigned his archbishopric into his hands, which, however, the pope, with the advice of his cardinals, immediately restored to him, appointing him a residence in the abbey of Pontigny in Burgundy.

When the ambassadors returned to England, and made their report, Henry was highly offended both with the pope and the archbishop; and in token of his resentment prohibited the payment of peter-pence, and commanded all clerks who presumed to appeal to the pope to be imprisoned. He also commanded all the goods and revenues of the archbishop, and of all the clergy who adhered to him, to be seized; and proceeded to confiscate the estates, and to banish the persons of all the primate's friends, retainers, and relations, to the number of about 400. Becket, during his residence at Pontigny, employed himself in exercises of devotion, and also in writing expostulatory letters to the

king and bishops of England, in issuing excommunications against several officers of the crown, and in threatening even to excommunicate the king himself. Notwithstanding a spirited remonstrance addressed to Becket by the English prelates, he persisted in his purpose; and communicated it to the pope in a letter, which represented Henry as a cruel, impious, unrelenting persecutor, who had tried and condemned Christ at Northampton, in his person. Henry was much alarmed; and called a council of his barons and prelates at Chinon in Touraine, to consider what was to be done for preventing his excommunication, or for guarding against its consequences. After a long deliberation, it was thought the most expedient to appeal to the pope. In the mean while Henry sent orders to England to guard the seacoasts, and to take other measures of precaution. Although Becket was prevented by the interposition of the king of France from executing his design of excommunicating Henry, he excommunicated his ministers and chief confidents, and declared the impious constitutions of Clarendon null and void, absolved all the bishops of England from the unlawful oath they had taken to obey them, and excommunicated all persons who paid any regard to them. Upon these presumptuous proceedings Henry threatened to expel all the monks of the Cistercian order from his dominions, if they any longer entertained his enemy, the archbishop of Canterbury at Pontigny; upon which he removed to Sens about Martinmas A.D. 1166, where an honourable asylum was provided for him by the king of France. The pertinacity of Becket rendered ineffectual for a long time all the efforts of the English prelates, of the pope, and of the king of France, for terminating the contention between him and the king of England. At length, however, all preliminaries for a reconciliation being adjusted by the papal nuncios, the archbishop was conducted in great state to an audience of his sovereign, July 22, A.D. 1170, in a meadow near Fretville, where the French and English courts, with a prodigious multitude of people of all ranks, were assembled. The conduct of the king on this occasion was singularly condescending; but Becket's lofty and resentful temper was so little impressed by it, that he returned Henry's civility and condescension with complaints and remonstrances. After a promise extorted from the king to repair all the injuries which had been done to the church, the archbishop dismounted, in order to throw himself at his feet; but Henry prevented him, and stooped so low as to hold his stirrup, and assist him in re-mounting. This reconciliation, however, was far from being cordial, on the part either of Henry or Becket, and it was not likely to be permanent. Whilst the archbishop was waiting at Whitsand, a sea-port in Flanders, previously to his return to England, he sent over three bulls, one for suspending the archbishop of York, who had been employed in crowning the young king, and two for excommunicating the bishops of London and Salisbury, who had assisted at this ceremony. This conduct, which was inexcusable at the moment when he pretended to return in peace, excited against him universal indignation, and eventually proved the cause of his ruin. On his reaching the English shore, attempts were made to prevent his landing, and he was insulted by some persons in arms, who commanded him in a threatening tone to absolve the excommunicated bishops. In his way to Canterbury he was accompanied by a great multitude of people, and entered the city in a kind of triumph amidst the acclamations of his attendants. Soon after his arrival, application was made to him for absolving the bishops whom he had suspended and excommunicated; and the young king, who concurred in the application, and who had issued an order for this purpose, was much incensed at his refusal, more especially as the censures which he had inflicted on those prelates who had assisted at his coronation seemed to call in question its validity. In his progress from Canterbury to Woodstock, where the young king resided, he was attended on his approach to London by prodigious crowds of people, and conducted to his lodgings in Southwark with loud acclamations; in return for which he scattered among the populace both money and episcopal benedictions. Here his vanity was mortified by a message from the young king, forbidding him to proceed any further, or to enter any royal town or castle, and commanding him to return immediately to Canterbury, and to confine himself within the precincts of his church. After his return to this city, he found himself deserted by many of his friends, and received reports of the insults they suffered, and the depredations that were committed upon his estates, so that he indulged gloomy apprehensions, and said to one of his chief confidents, "that he was now convinced this quarrel would not end without blood, but that he was determined to die for the liberties of the church." When the excommunicated prelates arrived in Normandy, and implored the protection of the king from the disgrace and ruin with which they were threatened by the primate, the indignation of Henry was roused, and in the moment of intemperate passion, he exclaimed, "shall this fellow, who came to court on a lame horse, with all his estate in a wallet behind him, trample upon his king, the royal family, and the whole kingdom? Will none of all those lazy cowardly knights, whom I maintain, deliver me from this turbulent priest?" This passionate exclamation made too deep an impression on those who heard it; and particularly on four barons, who formed a resolution, either to terrify the archbishop into submission, or to put him to death. Accordingly, having concerted their plan, they set out for Canterbury by different routes and arrived at a castle about 6 miles from the city on the 28th of December, A. D. 1170; and on the following day they proceeded to the city, and getting admission into the archbishop's apartment, they told him, that they were sent by the king with a command that he should absolve the prelates, and others whom he had excommunicated, and then go to Winchester, and make satisfaction to the young king, whom he had endeavoured to dethrone. Becket, after a violent altercation, in the course of which hints were given that his life was in danger if he did not comply, persisted in his refusal. Upon the departure of the barons, one of them charged his servants not to let him flee; to which Becket, who overheard them, replied with great vehemence; "flee! I will never flee from any man living. I am not come to flee, but to defy the rage of impious assassins." The barons, with their accomplices, finding their threats ineffectual, put on their coats of mail; and taking each a sword in his right hand, and an ax in his left, returned to the palace, but found the gate shut. When they were preparing to break it open, Robert de Broc conducted them up a back stair-case, and let them in through a window. A cry then arose, "they are armed! they are armed!" on which the clergy hurried the archbishop almost by force into the church, hoping that the sacredness of the place would protect him from violence. They would also have shut the door; but he exclaimed "begone, ye cowards: I charge you on your obedience, do not shut the door. What, make a castle of a church!" The conspirators having searched the palace, came to the church, and one of them exclaiming "Where is that traitor? where is the archbishop?" Becket advanced boldly, and replied, "here I am, an archbishop, but no traitor!—I am ready to suffer in the name of him who redeemed me with his blood. God forbid that I should fly for fear of your swords, or recede from

from juſtice." They once more commanded him to take off the excommunication and ſuſpenſion of the biſhops. He replied "no ſatiſfaction has yet been made; nor will I abſolve them." "Then," ſaid they, "thou ſhalt inſtantly die according to thy deſert." "I am ready to die," replied Becket, "that the church may obtain liberty and peace in my blood. But in the name of God, I forbid you to hurt any of my people." They now ruſhed upon him, and endeavoured to drag him out of the church, with an intention, as they themſelves afterwards declared, to carry him in bonds to the king, or if they could not do that to kill him in a leſs ſacred place. But as he clung faſt to one of the pillars of the choir, they could not free him from thence. During the ſtruggle, he ſhook William de Tracy ſo roughly, that he almoſt threw him down; and as Reinald Fitzurſe preſſed harder upon him than any of the others, he thruſt him away, and called him "pimp." This opprobrious language more enraged that violent man; he lifted up his ſword againſt the head of Becket, who, bowing his neck, and joining his hands together, in a poſture of prayer, recommended his own ſoul, and the cauſe of the church, to God, and to the ſaints of that cathedral. But Edward Grime, one of the monks of Canterbury, interpoſing his arm to ward off the blow, it was almoſt cut off; and the archbiſhop alſo was wounded in the crown of his head. He ſtood a ſecond ſtroke, which likewiſe fell on his head, in the ſame devout poſture, without a motion, word, or groan; but after receiving a third, he fell proſtrate on his face; and all the accomplices preſſing now to a ſhare in the murder, a piece of his ſkull was ſtruck off by one of them; upon which another ſcooped out the brains of the dead archbiſhop with the point of a ſword, and ſcattered them over the pavement of the church.

Thus was aſſaſſinated, in the 53d year of his age, and 9th of his pontificate, A.D. 1170. Dec. 29, Thomas Becket;—"a man," ſays lord Lyttelton, "of great talents, of elevated thoughts, and of invincible courage; but of a moſt violent and turbulent ſpirit; exceſſively paſſionate, haughty, and vain-glorious; in his reſolutions inflexible, in his reſentments implacable. It cannot be denied that he was guilty of a wilful and premeditated perjury; that he oppoſed the neceſſary courſe of public juſtice, and acted in defiance of the laws of his country, laws which he had moſt ſolemnly acknowledged and confirmed; nor is it leſs evident, that during the heat of this diſpute, he was in the higheſt degree ungrateful to a very kind maſter, whoſe confidence in him had been boundleſs, and who from a private condition had advanced him to be the ſecond man in his kingdom. On what motives he acted can be certainly judged of by Him alone, *to whom all hearts are open*. He might be miſled by the prejudices of a bigotted age, and think he was doing an acceptable ſervice to God, in contending, even to death, for the utmoſt exceſs of eccleſiaſtical and papal authority. Yet the ſtrength of his underſtanding, his converſation in courts and camps, among perſons whoſe notions were more free and enlarged, the different colour of his former life, and the ſuddenneſs of the change which ſeemed to be wrought in him upon his election to Canterbury, would make one ſuſpect, as many did in the times wherein he lived, that he only became the champion of the church from an ambitious deſire of ſharing its power; a power more independent on the favour of the king, and therefore more agreeable to the haughtineſs of his mind, than that which he had enjoyed as miniſter of the crown. And this ſuſpicion is increaſed by the marks of cunning and falſeneſs which are evidently ſeen in his conduct on ſome occaſions. Neither is it impoſſible, that when firſt he aſſumed his new character, he might act the part of a zealot, merely or principally from motives of arrogance and ambition; yet afterwards, being engaged and inflamed by the conteſt, work himſelf up into a real enthuſiaſm. The continual praiſes of thoſe with whom he acted, the honours done him in his exile by all the clergy of France, and the vanity which appears ſo predominant in his mind, may have conduced to operate ſuch a change. He certainly ſhewed in the latter part of his life a ſpirit as fervent as the warmeſt enthuſiaſt's; ſuch a ſpirit indeed as conſtitutes *heroiſm*, when it exerts itſelf in a cauſe beneficial to mankind. Had he defended the eſtabliſhed laws of his country, and the fundamental rules of civil juſtice, with as much zeal and intrepidity as he oppoſed them, he would have deſerved to be ranked with thoſe great men, whoſe virtues make one eaſily forget the alloy of ſome natural imperfections; but unhappily his good qualities were ſo miſapplied, that they became no leſs hurtful to the public weal of the kingdom, than the worſt of his vices." Mr. Hume cloſes his account of the aſſaſſination of Becket with the following concise ſketch of his character. He was "a prelate of the moſt lofty, intrepid, and inflexible ſpirit, who was able to cover to the world, and probably to himſelf, the enterpriſes of pride and ambition under the diſguiſe of ſanctity and of zeal for the intereſts of piety and religion. An extraordinary perſonage, truly, if he had been allowed to remain in his firſt ſtation, and had directed the vehemence of his character to the ſupport of law and juſtice; inſtead of being engaged, by the prejudices of the times, to ſacrifice all private duties and all public connections to ties which he imagined or repreſented as ſuperior to every civil or political conſideration. But no man, who enters into the genius of that age, can reaſonably doubt of this prelate's ſincerity." Another judicious hiſtorian (Dr. Henry) ſays of Becket: "He was evidently a man of very great abilities, particularly of conſummate cunning, undaunted courage, and invincible conſtancy in the proſecution of his deſigns. But his ſchemes were of a moſt pernicious tendency, to emancipate the miniſters of religion from the reſtraints of law, and to ſubject his king and country to a foreign power. He was vain, obſtinate, and implacable; as little affected by the entreaties of his friends, as by the threats of his enemies. His ingratitude to his royal maſter admits of no excuſe, and hath fixed an indelible ſtain upon his character. Though his murderers were highly criminal, his death was very ſeaſonable, and probably prevented much miſchief and confuſion."

The reſpect paid to the memory of Becket, after his death, was extravagant beyond all bounds, and remains on record as an evidence of the ſuperſtition and credulity which prevailed at the period in which it occurred. The king of England, to whoſe commands it was generally imputed, was repreſented as "that horrible perſecutor of God, who exceeded Nero in cruelty, Julian in perfidy, and Judas in treachery;" and the pope was loudly called upon by the kings of France and many prelates to draw the ſword of St. Peter, and to inflict ſome exquiſite puniſhment upon him. But none expreſſed greater grief and horror at this deed than Henry himſelf, who broke out into the loudeſt lamentations, refuſed to ſee any company, or admit of any conſolation for three days. He alſo diſpatched an embaſſy to Rome to vindicate himſelf from the imputation of having been the cauſe of it. All divine offices were ſuſpended for nearly a year in the church where it had happened; and the church itſelf was, by order of the pope, re-conſecrated. In 1173, Becket was canonized by a bull of pope Alexander; and a particular collect was appointed to be uſed in all the churches of the province of Canterbury, for expiating the guilt of his murder. In the

the following year, king Henry, on his return to England, went to Canterbury, where he did penance, and underwent a voluntary discipline, walking barefoot to his tomb, prostrating himself before it, and submitting to be scourged by the monks, passing all the day and night without any refreshment, kneeling on the bare stones, and bestowing great benefactions on the church of Canterbury, as a testimony of his regret for the murder. His virtues were the subjects of endless panegyric, and the miracles, operated by his relics, were more numerous, more nonsensical, and more impudently attested, says Hume, than those which ever filled the legend of any confessor or martyr. Gervase of Canterbury informs us, that two large volumes of them were preserved in that church. In 1221, his body was taken up in the presence of king Henry III. and a vast concourse of the nobility and others, and deposited in a rich shrine erected at the expence of archbishop Stephen Langton. This shrine was enriched with presents from all parts of Christendom; pilgrimages were performed to it for obtaining the martyred prelate's intercession with heaven; and it has been computed that, in one year, above 100,000 pilgrims arrived in Canterbury, for the purpose of paying their devotions at this tomb. "It is indeed," says Hume, "a mortifying reflection to those who are actuated by the love of fame, so justly denominated the last infirmity of noble minds, that the wisest legislator and most exalted genius that ever reformed or enlightened the world, can never expect such tributes of praise as are lavished on the memory of a pretended saint, whose whole conduct was probably, to the last degree, odious or contemptible, and whose industry was entirely devoted to the pursuits of objects pernicious to mankind." Lyttelton's Hist. Henry II. vol. ii. p. 321, &c. vol. iv. p. 361, &c. 8vo. Hume's Hist. of England, vol. i. p. 447, &c. 8vo. Henry's Hist. of Great Britain, vol. v. p. 340, &c. 8vo.

Becket, William, son of Isaac Becket, a surgeon of some eminence at Abingdon, in Berkshire, under whom he received his education, was born in the year 1684. At a proper age, he was sent to London, and was for some years pupil to Mr. Jos. Bateman, surgeon to St. Thomas's hospital in Southwark. That he was diligent in cultivating his profession, appears by the early specimens he gave of the result of what he had seen in practice: for in 1707, he published a collection of chirurgical observations, containing relations of some curious cases that had fallen under his notice; and in 1712, "New discoveries in the Cure of Cancers;" and soon after, a recital of the case of Dr. James Keil, the celebrated physician and mathematician, who died of a cancer in his mouth. Becket had been accused of mismanaging this case, and therefore published the account in vindication of his practice. In his New Discoveries, he pretends to have been frequently successful in removing cancerous tumours, by means of a digestive, the manner of preparing which he does not however disclose. In a subsequent edition of this work, he gives the description of a medicine, which had been used successfully, it was said, in eradicating cancers by the family of the Paines of Northampton. It consists of yellow arsenic and bole armenic, mixed to the consistence of a paste with the pulp of an apple. It is called the red caustic. A similar preparation has been since used by Plunket and others. In 1721, he published two letters addressed to sir Hans Sloane, in which he refutes the current opinion of the efficacy of the royal touch in curing the evil, which was perhaps preparatory to his being elected fellow of the Royal Society. About this time he published proposals for printing an account of the lives and writings of the most eminent British writers in medicine, in 2 vols. 8vo. which he did not however complete. Dr. Milward, who had formed a similar design, is said to have purchased what manuscripts were left by him on this subject, of his executors; but neither did he carry his intention into execution. It is probable that, while making this search after ancient British writers, Becket met with accounts of the disease called a brenning, and conceiving that to be a symptom of the venereal disease, he was induced to publish his three dissertations on the antiquity of that complaint, which was known, he says, before the discovery of the West Indies by Columbus. These were first printed in the Philosophical Transactions. Becket died at Abingdon in 1738. His works were collected together, and published in 9 vols. 8vo. in 1740, by the noted Mr. Edmund Curl.

Becket, Isaac, a mezzotinto engraver of some eminence, was born in Kent in 1653, was originally an apprentice to a calico-printer, and obtained the secret of scraping mezzotinto from one Loyd, a print-seller, with whom he lived for some time. He afterwards connected himself with an engraver in mezzotinto, with whom he had been acquainted at an earlier period of his life, and who assisted him, as he drew better and more expeditiously than himself. His mezzotintos are often clear and well scraped; but his middle tints are not sufficiently distinguished, so that his shadows appear flat and heavy. One of his best prints is engraved on a middling-sized upright plate, representing Adrian Beverland drawing from a statue, and having in the back ground monuments, pyramids, and several relics of antiquity. The time of his death is not known. Strutt.

Becket, St. Thomas, *Brotherhood of*, in *Commerce*, a name given to the most ancient company of English merchants of which history furnishes any record, which was established about the end of the 13th century, and thus called in honour of Becket. The design of this company was to export the woollen cloth, which about that time began to be manufactured in considerable quantities in England; and as that manufacture increased, the trade of the brotherhood also increased. Henry IV. A. D. 1406, incorporated this society by a charter, regulating their government and their privileges. By this charter, any merchant of England or Ireland, who desired it, was to be admitted into the company on paying a small fine. As this society was composed of the native subjects of the kings of England, it was favoured both by government and by the people, made gradual encroachments on the trade of the merchants of the staple, and at length ruined that company. Anderf. Comm. vol. i. p. 233, 260, &c. See Staple.

Becket, in *Geography*, a township of America, in Berkshire county, Massachusetts, containing 751 inhabitants, 10 miles east of Stockbridge, and 130 west from Boston.

BECKETS, in the *Marine*, signify large hooks, or circular wreaths of rope, or wooden brackets, used to confine ropes, tackles, oars, or spars, in a convenient place, till they are wanted. And *to put the tacks and sheets in the beckets*, is to hang up the weather-main and fore-sheet, and the lee-main and fore-tack, to a little knot and eye-becket on the fore-mast, main, and fore-shrouds, when the ship is close-hauled, to prevent them from hanging in the water. Some beckets have an eye spliced in one end, and a small walnut-knot crowned at the other, and some have both ends spliced together like a wreath. The noose made at the breast of a block, to make fast the standing part of a fall-to, is also called a becket.

BECKINGTON, Thomas, in *Biography*, an English prelate of the 15th century, was born in the parish of Beckington, in Somersetshire, towards the close of the 14th century, educated at Wykeham's school, near Winchester, and

and finished his studies at New College, Oxford, of which he was admitted fellow in 1408. After several ecclesiastical preferments he became dean of the arches about the year 1429, and was employed by a synod held in St. Paul's church, London, in conjunction with two other persons, to draw up a form of law, by which the prosecution of the Wickliffites, or Lollards, was to be conducted. Whilst he was tutor to king Henry VI. he wrote a book, preserved in manuscript in the Cottonian library, in which he strenuously asserted, in opposition to the salique law, the right of the kings of England to the crown of France; and then gaining the special favour and patronage of that prince, he was made secretary of state, keeper of the great seal, and bishop of Bath and Wells, to which he was consecrated in 1443. He is represented as having been well skilled in polite learning and history, and very conversant in the holy scriptures; as a good preacher, and as a generous patron of ingenious and learned men, so that he was called the Mæcenas of his age. His works of munificence and charity were numerous. He finished Lincoln college in Oxford; procured an endowment for New College, in 1440; laid out a considerable sum of money in repairing houses belonging to his see; and erected the west side of the cloisters at Wells, and also a conduit in the market place of that city. He died at Wells in 1465. A large collection of his letters is preserved in the library at Lambeth; and a volume of sermons and some other treatises are ascribed to him. Biog. Brit.

BECMARE, in *Entomology*, a genus of insects established by Geoffroy. See RHINOMACER.

BECOUYA, in *Geography*. See BEKIA.

BECSANGIL, a name sometimes given to a province of Asia, which is a part of Anatolia, bounded on the north by the Black sea, on the west by the sea of Marmora and the Archipelago, on the south by Natolia Proper, and on the east by the province of Bolli. The capital is Bursa.

BECTIVE, in the county of Meath, Ireland, where are considerable ruins of an abbey which belonged to the Cistercians. It was founded by Murchard O'Melachlin, king of Meath, in 1146; and being richly endowed, the abbot had a place among the peers in the assemblies of parliament, and wore a mitre. The cloisters with a tower are almost entire. It was pleasantly situated on the banks of the Boyne, over which river there was a bridge; and at present a little village, called *Bettive-bridge-end*, has two fairs annually. It is 3 miles from Trim, and about 24 from Dublin. Monastic Hibern. Ware's Antiquities.

BECTASSE, a sect among the Turks denominated from their founder Bectash, preacher to sultan Amurath.

All the Janizaries belonging to the Porte are of the religion of [illegible], and are held to have [illegible] from the founder of this sect. Their habit is white; on their heads they wear white caps of several pieces, with turbans of wool twisted rope-fashion. They observe constantly the hour of prayer, which they perform in their own assemblies, and they make frequent declarations of the unity of God.

BED, a place prepared to stretch and compose the body on, for rest and sleep; made chiefly of feathers inclosed in a ticken case. Of beds there are several sorts: as a feather-bed, a down-bed, a standing-bed, a settee-bed, a tent-bed, a truckle-bed, &c.

In the first and ruder ages of mankind, it was the universal practice to sleep upon the skins of beasts. This was the custom among the Greeks and Romans, and also among the Celtic nations, and ancient Britons. This custom prevailed till modern times among the common people in some parts of Germany. These skins, some of which are worn in the day, were spread at night on the floors of their apartments. In process of time, these skins were changed for loose rushes and heath, and afterwards for straw. Pliny (l. viii. c. 48. l. xvi. c. 36.) says, that the beds of the Roman gentry were generally filled with feathers, and those of the inns with the soft down of reeds. Straw was used even in the royal chambers of England, so late as the close of the 13th century. Beds, filled with chaff, heath, or straw, are used by the common people in many parts of Great Britain and Ireland, and also in France and Italy at this day. Beds were for a long time laid upon the ground; till at length the custom of raising the beds on feet or pedestals, which anciently prevailed in the East, and which was introduced into Italy, was adopted in Britain. But still the materials of which beds are made, and the manner of disposing them, vary among different ranks, and in different nations. By the English statutes, no beds are to be sold, except filled with one sort of stuffing only; e. gr. feather beds with only dry pulled feathers; and down beds with clean down alone. No scalded feathers are to be mixed with the former; nor fen-down with the latter, on pain of forfeiture; the mixture of such things being conceived as contagious for man's body to lie on. Stat. 11 Hen. VII. c. 13.

Also bed quilts, mattrasses, and cushions stuffed with horse-hair, fen-down, goat's hair, and neat's hair, which are dressed in lime; and which the heat of man's body will cause to exhale, and yield a noxious smell, whereby many of the king's subjects have been destroyed, are prohibited by the same statute.

The ancient Romans had various kinds of beds for repose; as their *lectus cubicularis*, or *chamber-bed*, whereon they slept; their *table-bed*, or *lectus discubitorius*, whereon they eat (for they always ate lying, or in a recumbent posture), there being usually three persons to one bed, whereof the middle place was accounted the most honourable, as well as the middle bed. See TRICLINIUM. These beds were unknown before the second Punic war: the Romans, till then, sat down to eat on plain wooden benches, in imitation of the heroes of Homer; or as Varro expresses it, after the manner of the Lacedæmonians and Cretans. An innovation in this practice is ascribed to Scipio Africanus, who brought from Carthage some of those little beds, called "Punicani," or "Archaici," which were of wood, very low, stuffed only with hay or straw, and covered with the skins of sheep or [illegible] These [illegible] of delicacy differed little from the wooden benches; but when the custom of bathing prevailed, the practice of resting themselves more commodiously by lying along than by sitting down, was adopted. As for the ladies, it did not seem at first consistent with their modesty to adopt the mode of lying; accordingly they kept to the old custom all the time of the commonwealth; but, from the first Cæsars, they ate on their beds. As to the youth, who did not yet put on the *toga virilis*, they were long kept to the ancient discipline. When they were admitted to table, they only sat on the edge of the beds of their nearest relations. Never, says Suetonius, did the young Cæsars, Caius and Lucius, eat at the table of Augustus; but they were set "in imo loco," or, as Tacitus expresses it, "ad lecti falera." From the greatest simplicity, the Romans, by degrees, carried their dining beds to the most surprising magnificence. Pliny assures us, it was no new thing to see them covered over with plates of silver, adorned with the softest mats, and the richest counterpanes. Hist. Nat. lib. xxxiii. cap. 11. Lampridius, speaking of Heliogabalus, says, that he had beds of solid silver; and Pompey, in his third triumph, introduced beds of gold. They had also their *lectus lucubratorius*, on which they studied; and

and a *lectus funebris*, or *emortualis*, on which the dead were carried to the pile. See FUNERAL.

BED *of State*. See PARADE.

BED *of Justice*, *Lit de Justice*, in the French *Laws*, denoted a throne on which the king used to be seated in parliament. In this sense, he was said to hold his *lit de justice*, when he went to the parliament of Paris, and held a solemn session, under a high canopy erected for the purpose. The bed of justice was only held on affairs relating to the state; on which occasion, all the officers of the parliament appeared in red robes; at other times they wore black ones. Several authors have treated expresly on the ceremonies of the bed of justice.

BED *of a great Gun*, is a piece of plank laid within the cheeks of the carriage, on the middle transum, for the breech of the gun to rest on.

BED, or *Stool of a Mortar*, is a solid piece of oak, in form of a parallelopiped, bigger or less, according to the dimensions of the mortar, hollowed a little in the middle to receive the breech and half the trunnions. On the sides of the bed are fixed the cheeks or brackets by four bolts of iron.

In ships, when the decks lie too low from the ports, so that the carriages of the pieces, with the trucks, cannot mount the ordnance sufficiently, but that they lie too near the gunwale; the method is to make a false deck for so much as the piece will require for her traversing to raise it higher; and this they call a *bed*.

BED, in *Gardening*, a small elevated plot or compartment of ground, of three, four, or more feet in breadth, which is useful in the culture of many sorts of plants, especially those of the smaller kinds. It is always an eligible practice to sow and prick out different sorts of small plants on beds having narrow alleys between them, for the greater convenience of weeding, watering, gathering, &c. as by this means such operations can be performed without trampling on the crops. Thus the ground intended for asparagus and strawberries should be divided into four feet wide beds, with eighteen inches or two feet alleys between them. Onions are likewise cultivated to the best advantage on four feet wide beds, having ten or twelve inch alleys; the different sorts of lettuce and endive should also be sown and transplanted into separate beds occasionally; and also various sorts of small plants, which can be more conveniently cultivated on beds, or in borders of similar widths. Early radishes are generally sown on beds, or similar compartments, as being more convenient for the purposes of covering them occasionally in frosty nights, and for weeding, thinning, watering, and gathering them.

All sorts of plants that are particularly intended for transplantation, should be sown in beds or narrow borders, so as to admit of standing to weed, water, and draw the plants, without treading upon them; and for the same reason, all plants necessary to be pricked out previously to their final transplanting, should also be put out on such beds; as celery, cabbages, cauliflowers, broccoli, &c. Aromatic and medicinal herbs of all sorts should also, for the greatest part, be disposed in beds with twelve or fifteen inch alleys between, or at least in borders of similar widths; particularly mint, thyme, savory, marjoram, sage, hyssop, balm, penny-royal, tansey, tarragon, feverfew, rue, &c. as this method of bedding all sorts of small plants is not only more commodious for performing the necessary operations without injuring the plants, but has an air of uniformity which is constantly to be observed in garden work.

The most proper dimensions for beds of this sort, as has been observed, is four feet or four feet and a half in width, the length at pleasure, with intervening shallow alleys of from nine, twelve, or fifteen inches to two feet width, according to the different sorts of plants, so that a person in the alleys may easily reach half across them to do the necessary work without trampling the plants down, or treading the surface of the ground hard.

Where flower gardens are wanted to be distinct from the general pleasure ground, the spaces should be divided into regular parallel beds, of three or four feet in width, with eighteen inches or two feet wide alleys, especially when chiefly intended for the curious sorts of bulbous rooted flowers, such as tulips, hyacinths, ranunculuses, anemones, and other choice sorts, where, by being deposited together in beds, having intervening alleys, they admit of passing between them, to perform the necessary business of culture more easily, as well as to view the plants when in flower. Many sorts likewise appear to greater advantage in this way.

The beds, in these cases, should be neatly edged with box or thrift. See EDGING.

The grounds of nurseries intended for raising all sorts of flowers from seeds, slips, cuttings, parting of roots, &c. should also be divided into beds of three or four feet in width. And in large nurseries for trees, the ground intended for the reception of cuttings of most sorts of hardy trees and shrubs, should also be generally divided into three or four feet beds, having twelve or fifteen inch alleys between them.

Beds in common should only be raised a very little higher than the alleys, unless in cases of too much stagnant moisture, three or four inches higher than the level of the alley is mostly sufficient; for when raised considerably, the alleys assume the appearance of trenches, and have a disagreeable effect.

The earth of all sorts of beds should be well broken down, and laid as even as possible in digging them over, being afterwards raked into neat order on the surface.

Beds for raising melons, mushrooms, and the like, are commonly denominated *ridges*.

BEDS, in speaking of hops, denote the floors whereon they are spread to dry.

BED *of Corn*, is a heap, flat at top, three or four feet high; otherwise called a *couch*.

BED-*algense*, a name given by the Arab *Astronomers* to a fixed star of the first magnitude in the right shoulder of ORION. *Bed-algense* is of a ruddy colour, by which it is easily distinguished.

BED, in *Masonry*, denotes a course or range of stones.

BED, *Joint of the*, is the mortar between two stones placed over each other.

BED, in *Sea Language*, a flat, thick piece of timber laid under the quarters of casks, containing any liquid, and stowed in the ship's hold.

BED *of a River*, the bottom of the channel in which the stream flows.

BEDS, in speaking of minerals and fossils, signify certain strata, or layers of matter, disposed over each other.

BEDS, in the *New Husbandry*, denote the spaces occupied by the rows of corn, in contradistinction from the open spaces between them, which are called alleys.

BEDALACH, in the *Materia Medica*, a name given by some writers to the gum bdellium; but particularly to that kind of it which was brought from Arabia, and was of a yellowish colour, like wax.

BED-CHAMBER.—*Lords or Gentlemen of the* BED-CHAMBER, are persons of the first rank, fourteen in number, whose office used to be, each in his turn, to attend a week in the king's bed-chamber, lying by the king on a pallet-

yeomen-bed all night, and to wait on the king when he eats in private. Their salary is 1000l. per annum. The first of these is called *groom of the* STOLE. There are also twelve grooms of the bed-chamber.

BED-MOULDING, in *Architecture*, is a term used by workmen to express those members of a cornice which lie below the corona. A bed-moulding usually consists of these four members, an ogee, a list, a large boultine, and another list under the coronet.

BEDA, or BEDE, distinguished by the epithet *Venerable*, in *Biography*, a learned monk of the eighth century, and one of the best writers of his time, was born in the neighbourhood of Weremouth, in the bishopric of Durham, in 672 or 673. At the age of seven years he was brought to the monastery of St. Peter, founded near the place of his nativity about two years after he was born; and the care of his education was entrusted with abbot Benedict, his successor Ceolfrid, and John of Beverly, for twelve years. Endowed with an excellent genius, and distinguished by assiduous application, his progress in various branches of learning, during this period, was very considerable. At the close of it, or when he had attained the age of 19 years, he was ordained a deacon by the last mentioned preceptor, then bishop of Hexham, and afterwards archbishop of York. About this time he seems to have removed from the monastery of St. Peter's at Weremouth, where he was educated, to that of St. Paul's at Jarrow, near the mouth of the river Tyne, founded, as the former had been, by the abbot Benedict. Here he was employed in the prosecution of his own studies, and in aiding those of others who resorted to this monastery for instruction. His whole life, which he spent in this retreat, was devoted, as he himself informs us, to the exercises of devotion in the church, and to those of teaching, reading, and writing. At the age of thirty, A.D. 702, he was ordained priest by the same person from whom he had received deacon's orders. Although he lived in retirement, the fame of his learning and character soon spread over Europe; so that pope Sergius addressed a letter to abbot Ceolfrid, in which he urged him to send Bede to Rome. The death of the pope, which probably happened soon after this letter was written, prevented Bede from leaving his own country; nor indeed does it appear, with sufficient evidence, that he ever quitted Northumberland, though some have said that he visited the university founded at Grantcheller or Cambridge, and this fact they allege as a proof of the antiquity of this university. Within the walls of the monastery, in which he chose to reside, he was indefatigable in the acquisition of knowledge, and in the communication of it to others. It appears, from his numerous works on a variety of subjects, that his knowledge comprehended every kind of literature and science that was known at the period in which he lived; and from other collateral evidence of unquestionable authority, that he was justly entitled to the appellations of "the wise Saxon," and of "Venerable Bede," conferred on him by his contemporaries, and uniformly retained by posterity. From his never having accepted any preferment above the humble rank of an unbenefiiced priest, we may infer his singular moderation; his letter addressed to his intimate friend, the learned Egbert, archbishop of York, and containing excellent advice, the result of long experience, evinces the purity of his morals and the liberality of his sentiments; and as he was never canonized as a saint, and the legends of the time record no miracle performed by him, we may reasonably conclude, that enthusiasm and the spirit of his order formed no part of his character. He appears indeed, as one of his biographers sums up his account of him, "to have possessed the rare association of learning with modesty, of devotion with liberality, and of high reputation in the church with voluntary and honourable poverty."

The largest and most popular of Bede's works is his history of the church, intitled, "Ecclesiasticæ Historiæ Gentis Anglorum libri quinque," and first published in 731, the year to which he continued his history of Christianity from its first introduction into Britain. In collecting materials for this history, he consulted several chronicles of the English kings before his time; he kept up a correspondence in the several kingdoms of the heptarchy, and he had recourse to various records and archives preserved in several monasteries; and his history has been regarded as containing the most authentic and comprehensive account of the early state of Christianity in this country. The famous Milton, indeed, has objected to this history, that it is deficient with regard to the civil affairs of the country, which are mentioned very cursorily, and which form rather a calendar of dates, than a regular history; but if it be duly considered, that his object was the state of the church, and not the secular transactions of the period which his history comprehends, this objection must appear to be urged against it without sufficient reason. Milton himself confessed, that he travelled with much worse guides after he parted with Beda. The charge that has been alleged against him, of partiality to the Saxons in preference to the Britons, seems to be less exceptionable. But the chief objection to which his history is liable, is the diffuse account which he introduced of legendary miracles and of other trivial and absurd circumstances, extracted without sufficient discrimination and with apparent credulity from the chronicles to which he had access; and yet, when we recollect the period in which he lived, and consider, that the principal transactions of the church upon record consisted of such fooleries and impostures, we may admit some apology for a writer who wished to approve himself a faithful historian. Without adverting to the censures of M. du Pin, which extend to the style and subjects of Bede's works in general, and which are amply stated and satisfactorily obviated in the Biog. Brit., it may not be improper to mention the objection urged by father Pezron against the chronology of Bede. This father, who has taken great pains, after Isaac Vossius and father Morin, to support the chronology of the Septuagint, informs us, that Bede was the first who endeavoured, in the western church, to maintain the shorter chronology of the Hebrew text; and archbishop Usher, in his "Sacred Chronology," observes that Bede was considered as an heretic on account of this innovation. However, his computation was afterwards received, and scarcely any other was admitted in the west till the three learned men above-mentioned appeared in defence of the contrary opinion. If Bede, therefore, was singular in being an advocate for the Hebrew chronology, this singularity affords evidence of his learning, penetration, and good sense. The author's ecclesiastical history is written in easy, though not very elegant Latin; and as to the faults in his style, which some, and particularly Du Pin, have censured, they will not appear to be very great, if compared with contemporary writers; and to compare him with others is certainly unjust. Of the Latin original of this History there have been several editions with notes and commentaries; particularly at Antwerp in 1550, at Heidelberg in 1587, at Cologne in 1601, at Cambridge in 1644, at Paris in 1681, and at Cambridge in 1722. A Saxon version attributed to king Alfred, with learned notes by Abraham Wheloc, was printed at Cambridge in 1644; and an English translation by Dr. Stapleton was printed at Antwerp in 1565. The design of the latter translation was to support the popish religion, and of course it is not deemed very faithful; but the history of Bede,

Bede, even as he has given it in English, might in many passages be shewn to be far enough from favouring the doctrines of the church of Rome.

The last literary labour of venerable Bede, was "A Translation of the Gospel of St. John into the Saxon Language," which he completed with difficulty on the day and hour of his death, which happened on the 26th of May, A. D. 735. The disorder of which he died was an asthma; and he bore the pain that attended it with exemplary fortitude and patience, discharging the duties of his office, and prosecuting the works in which he was engaged, and which he wished to finish, with unabated assiduity. During many sleepless nights, he is said to have sung praises to Almighty God; and in the prospect of dissolution, he did not dissemble his apprehensions of it, though he expressed the utmost confidence in the divine mercy, and was able, on a review of his conduct, to declare seriously that he had so lived, as not to be ashamed to die. During an act of devotion, and whilst he was pronouncing the last word of it, he expired. It would be easy to cite a great number of testimonies to the extent of Bede's learning, as well as to the excellence of his character. William of Malmesbury, after giving him an extraordinary character, tells us, "that it was much more easy to admire him in thought, than to do him justice in expression." Bale assures us, that he was so well skilled in the writings of Pagan authors, that he had scarcely an equal in that age, and that he learned natural philosophy and mathematics from the purest sources, the Greek and Latin authors themselves. Pits says, that he was so well versed in all the branches of learning, that Europe scarcely ever produced a greater scholar in all respects; that even, while he was living, his writings were of such authority, that it was ordered by a council held in England, and approved afterwards by the catholic church, that they should be publicly read in the churches; that from his earliest years, he was remarkable for his piety and love of learning, alternating without interruption his prayers and his studies; and that his intense application furnished him with a complete knowledge of poetry, rhetoric, natural philosophy, metaphysics, astronomy, arithmetic, music, geometry, cosmography, chronology, history, and the whole circle of the liberal arts, and all parts of mathematics, philosophy, and divinity. Camden represents him as the singular light of our England; and many testimonies in his favour may be found in the works of our historians and antiquarians, such as Hollinshed, Stowe, Speed, Selden, sir Henry Spelman, Stillingfleet, Mabillon, Warton, &c.

Besides the History, the translation of St. John's gospel, and the letter to Egbert already mentioned, there are a great many works, both published and in manuscript, that have beeen attributed to Bede; some of which, however, are of dubious genuineness. They are enumerated in the Biographia Britannica, Cave's Hist. Lit. and in the appendix to the fourth volume of Henry's History. They compose a very miscellaneous collection of versions and commentaries upon several books of the Old and New Testament, of legends, and theological dissertations; among which are some of greater value on the scripture chronology, and many elementary compilations, for the use of his scholars, on the subjects of arithmetic, grammar, rhetoric, astronomy, music, and natural philosophy. The first general collection of his works appeared at Paris, in 1544, in 3 vols. folio; and again in 1544, at the same place, in 8 vols.; at Basil, in the same size and number of volumes, in 1563, reprinted at Cologne in 1612, and at the same place in 1688. Several of Bede's works have been separately printed; and those treatises, which are mentioned in his own catalogue of his works, annexed to his ecclesiastical history, were published by the learned and industrious Mr. Wharton, from three manuscripts in the archiepiscopal palace at Lambeth, London, 1693, 4to. Cave's Hist. Lit. vol. i. p. 612, &c. Henry's Hist. vol. iv. p. 26, &c. Wharton's Hist. Poetry, vol. i. diss. 2. Biog. Brit. Gen. Dict.

It is from the *Ecclesiastical History* of this worthy monk, that we know any thing concerning music in our country during the seventh and eighth centuries, the most barbarous period of its annals. In his account of the conversion of the Saxons to Christianity, he speaks of *litanies* and *allelujahs* being sung in the Gregorian manner, according to the Roman ritual, when bishop Stillingfleet thinks that the goodness of the music was the principal incitement to the reception of the mass by the Saxons.

Bede was himself an able musician, and is supposed to have been the author of a short musical tract, "De Musica Theorica, et Practica seu Mensurata." Of the two parts of this treatise ascribed to Bede, the first *may* have been written by him; the second, however, is manifestly the work of a much more modern author; for we find in it, not only the mention of music in two or three different parts, under the name of *discant*, but of instruments never mentioned in writers contemporary with Bede; such as the *organ*, *viole*, *atola*, *&c.* A notation too of much later times appears here, in which the *long*, the *breve*, and *semibreve*, are used, and these upon *five lines* and spaces, with equivalent rests and pauses. The word *modus* is also used for *time* in the sense to which the term *mood* was applied after it ceased to mean *key*. Upon the whole it seems as if this last part of the tract attributed to Bede, was written about the twelfth century: that is, between the time of Guido and John de Muris.

Bede, however, informs us that, in 680, John, præcentor of St. Peter's in Rome, was sent over by pope Agatho to instruct the monks of Weremouth in the art of singing, and particularly to acquaint them with the manner of performing the festival services throughout the year, according to that which was practised at Rome. And such was the reputation of his skill, that "the masters of music from all the other monasteries of the north came to hear him; and prevailed on him to open schools for teaching music in other places of the kingdom of Northumberland."

And it is from Bede's information that we have any knowledge of the social and domestic singing to the harp in the Saxon language, upon our island, at the beginning of the eighth century; which is amply detailed in bishop Percy's essay on the ancient English minstrels. Reliques of Ancient Poetry.

Beda, or Bede, Noel, a doctor of divinity in the university of Paris, was a native of Picardy, and flourished in the beginning of the sixteenth century. His temper was violent and impetuous, and he was a great enemy to every kind of innovation and reform. Erasmus and Faber Stapulensis, who were great promoters of literature, were the objects of his vehement attack. Against the scriptural paraphrases of the former he wrote a book, in which Erasmus detected many misrepresentations and calumnies; and yet such was his influence among his brethren, that he induced the faculty of divinity to censure the works of his antagonist. In his opposition to the design of Francis I. for obliging the Sorbonne to concur with the other universities of France in giving a favourable opinion concerning the divorce of Henry VIII. of England, he acted a more justifiable part; but he injured his character, and ruined his cause, by his passionate and turbulent behaviour, and involved himself in the crime of perjury. After having made the *amende honorable*, by publicly acknowledging that he had spoken against truth and the king, before the church of Notre Dame, he was committed to prison in 1535, and afterwards sentenced to

be banished to the abbey of mount St. Michael, where he died in the year 1537. He was a furious persecutor of the protestants, and one of the chief promoters of the punishment of Lewis de Berguin, the protestant martyr. His Latin works were a treatise "De unicâ Magdalenâ," against Faber, Paris, 1519; "Two books against Faber's Commentaries and Erasmus's Paraphrases," Paris, 1526; "An Apology against the secret Lutherans," Paris; and "An Apology for the Daughters and Grand-children of St. Anne," against Faber. His works in French were "A Restitution of the Benediction of the Paschal taper," and "A Confession of Faith." Gen. Dict. Nouv. Dict. Hist.

Beda, a sacred book of the religion and law of the Brahmins of Hindoostan, called also *Vedam* and *Viedam*, which see; see also Brachmans, and Shastah.

BEDALE, in *Geography*, a market town of England. It is situated in that division of the north riding of Yorkshire called Richmondshire, at the distance of 6 miles from North Allerton, and 223 miles north of London. Seated on the bank of a small river, it enjoys a pleasant and fertile situation; but being at some distance from any public road, its principal trade is derived from a weekly market and five annual fairs. These are abundantly supplied with horses; the buying and selling of which are the chief business of many persons in this part of Yorkshire. The rectory of this town is very valuable; and the church, which is a large handsome structure, contains some ancient monuments, one of which commemorates Brian Fitz Alan, the last male heir of that family. A Roman road passed through this town to Barnard castle, &c.: and some Roman encampments are remaining on the high grounds between this town and Ripon. Here is a charity school; and the township contains 226 houses, with 1205 inhabitants.

BEDANG, a commentary on the Beda of the Brahmins of Hindoostan, called also *Shaster* or *Shastah*; which see.

BEDARIDES, in *Geography*, a town of France, in the department of Vaucluse and chief place of a canton, in the district of Avignon. The place contains 1658 and the canton 6206 inhabitants: the territory includes 107½ kilometres and 4 communes.

BEDARIEUX, a town of France, in the department of the Herault, and chief place of a canton, in the district of Beziers, seated on the Orbe, 5½ leagues north of Beziers. The inhabitants carry on a manufacture of druggets and other woollen stuffs. The place contains 3338 and the canton 8061 inhabitants: the territory includes 142½ kilometers and 7 communes. N. lat. 43° 27′. E. long 3° 24′.

BEDAS, Bedahs, or Vaddahs, a name given to a species of savages, who occupy a small district in the northern part of the island of Ceylon, and who seem to be (says Buffon) of a peculiar race. The spot which they inhabit is entirely covered with wood, where they conceal themselves in such a manner, that it is difficult to discover them. Their complexion is fair, and sometimes red, like that of the Europeans. Their language has no analogy to that of any of the other Indian languages. They have no villages or houses, and hold no intercourse with the rest of mankind. Their arms are bows and arrows, with which they kill a number of boars, stags, and other animals. They never dress their meat, but season it with honey, of which they have great abundance. The wildest of these woodland wanderers recognize no authority, except that of their own chiefs; but others, without formally acknowledging the sovereignty of the king, furnish him with ivory, wax, and deer. Such of them as skirt the European territories, barter their articles with the Cingalese for the simple things which their mode of life requires. To prevent themselves from being surprised or made prisoners, while carrying on this traffic, the method they employ is curious: when they stand in need of cloth, iron, knives, or any other articles of smith's work, they approach by night some town or village, and deposit, in a place where it is likely to be immediately discovered, a certain quantity of their goods, along with a talipot leaf expressive of what they want in return. On a following night they repair again to the same place, and generally find their expected reward awaiting them. For although they are easily satisfied, and readily allow the advantage to the person with whom they deal, yet if their requests are treated with neglect, they will not fail to watch their opportunity of doing him a mischief. The Cingalese, as they can afterward dispose of the articles afforded by the Bedahs, find the traffic profitable; and in some parts frequently go into the woods, carrying with them articles of barter. This trade, however, can only be carried on in the manner already described; for no native of the woods can be more afraid of approaching a stranger than the Bedahs. Few will venture even to converse with other natives; but the wilder class, known by the name of "Ramba-Vaddahs," are more seldom seen even by stealth than the most timid of the wild animals. The origin of this small tribe, who live in detached families, is unknown. These Bedas, as well as the Chacrelas of Java, who are both fair and few in number, appear (says Buffon) to be of European extraction; and he conjectures, that some European men and women have been formerly left on these islands by shipwreck or otherwise, and that, for fear of being maltreated by the natives, they and their descendants confined themselves to the woody and mountainous parts of their country, where they retain a savage life. See Ceylon.

BEDASPES, in *Ancient Geography*, the name given by Ptolemy to the Hydaspes, or modern Behut, a river of Hindoostan. See Hydaspes, and Behut.

BEDAT, Le, in *Geography*, a river of France, which runs into the Allier, near Montferand.

BEDBURG, a town of Germany, in the circle of the Lower Rhine, and electorate of Cologne, seated on the Erfft, 14 miles west of Cologne. N. lat. 51°. E. long. 6° 20′.

BEDDING, *lectoria*, in respect of horses and other cattle, denotes straw or litter spread under them to lie on.

Bedding, in speaking of a roe, is used by sportsmen for the lodging of that beast. A roe is said to *bed*; a hart to *harbour*; a fox to *kennel*.

BEDE Point, in *Geography*, the eastern cape at the mouth of Cook's river, on the north-west coast of North America.

BEDEA, Badeah, or Baideah, the name of a valley near the Red sea, which, according to Niebuhr, is 6 German miles from Suez, and where the sea (Bruce says) is something less than 4 leagues broad, by 50 feet deep. This valley ends in a pass between two considerable mountains, called Gewoube on the south, and Jibbel Attakah on the north; and opens into the low stripe of country which runs along the Red sea. The mouth of this valley, opening to the flat country and the sea, was called "Pihahiroth;" and through this valley it has been supposed that the Israelites made their passage from the pursuing army of Pharaoh to the Red sea; and it is added, that they encamped in the bay which terminated this valley, at Pihahiroth, opposite to Baal-Zephon (which see), betwixt Migdol and that sea. In these circumstances, says Dr. Shaw, the Egyptians might well imagine, that the Israelites could have no possible way of escape; inasmuch as the mountains of Gewoube would stop their flight or progress towards the south, as those of Attakah would prevent their passing towards the land of the Philistines: the Red sea likewise lay before them to the east; whilst Pharaoh closed up the valley behind

them, with his chariots and horſemen. This valley, adds Dr. Shaw, is called "Tiah Beni Iſrael," i. e. the road of the Iſraelites, from a tradition, that is ſtill kept up by the Arabs, of their having paſſed though it. It is alſo called "Baideah," he ſays, from the *new* and unheard-of *miracle*, that was wrought near it, by dividing the Red ſea, and deſtroying in it Pharaoh, his chariots, and horſemen. Bruce obſerves, that Dr. Shaw, by interpreting "Badeah" as the "valley of the miracle," forces an etymology, becauſe there was yet no miracle wrought, nor was there ever any in the valley. But "Badeah," he ſays, means "barren," and "uninhabited;" ſuch as we may imagine a valley between ſtony mountains, a deſert valley. To his tranſlation of "Jibbel Attakah," as the "mountain of deliverance," Bruce objects, that ſo far were the Iſraelites from being delivered, on their arrival at this mountain, that they were then in the greateſt diſtreſs and danger. Attakah means, according to this traveller, to "arrive," or "come up with;" either becauſe they arrived within ſight of the Red ſea; or it might more probably derive its name from the arrival of Pharaoh, or his coming in ſight of the Iſraelites, when encamped between Migdol and the Red ſea. Shaw's Travels, p. 302. Bruce's Travels in Abyſſinia, vol. i. p. 232, &c.

A late writer obſerves, that this hypotheſis of the paſſage of the Iſraelites at Bedea, has been given up by our beſt modern critics; and the "Sinus Heroopolitanus," or gulf of Suez, pitched upon as the ſcene of action. The idea was firſt ſuggeſted by Le Clerc, and ſince adopted and defended by Michaelis, Niebuhr, and almoſt all the German commentators. Mr. Bryant, however (Obſ. on the Plagues of Egypt, p. 378.), ſtill contends for Bedea, and calls the arguments of Niebuhr prejudices and miſconceptions. The writer, to whom we now refer, who excludes from this event every thing that was miraculous, contends, for the paſs at Suez, or not far from Suez, where, he ſays, at this day there are ſhallows fordable at low water, and which might, in former times, have been frequently dry. Geddes's Critical Remarks, vol. i. p. 225. See Suez.

BEDEC, a town of France, in the department of the Ille and Vilaine, and chief place of a canton, in the diſtrict of Montfort, one league N. of Montfort.

BEDEGUAR, in the *Materia Medica*, the name of a fungus, or gall, growing upon the roſe plant (roſa ſilveſtris), which belongs to the claſs of aſtringents, as it is poſſeſſed of and celebrated for its aſtringent power; but it has hardly yet got a place in our diſpenſatories, and we are quite unacquainted with its powers. Cullen's Mat. Med. vol. ii. p. 36.

BEDEL, or Bedeo, *Bay*, in *Geography*, lies in the gulf of the river of St. Lawrence, on the ſouth-weſt coaſt of the iſland of St. John's, in North America, and is ſituated S. by E. from Egmont bay, on the ſame coaſt of the iſland.

BEDELL, William, in *Biography*, an eminent prelate of the Engliſh church in Ireland, was born at Black Notley in Eſſex in 1570; and being deſigned for the church, was educated at Emanuel college in the univerſity of Cambridge. Having been choſen fellow of his college in 1593, and taken his degree of bachelor of divinity in 1599, he removed to St. Edmundſbury in Suffolk, where he continued in high eſtimation for his attention to the duties of his profeſſion till he accompanied ſir Henry Wotton to Venice, as his chaplain. Here he became intimately acquainted with father Paul Sarpi, who taught him the Italian language, into which he tranſlated the Engliſh common prayer book; and in return for the favour conferred upon him by father Paul, he drew up an Engliſh grammar for his uſe, and aſſiſted him in his ſtudies. During his ſtay at Venice, he availed himſelf of the aſſiſtance of Rabbi Leo, in acquiring the knowledge of the Hebrew language, and of Rabbinical learning; and by his means he had an opportunity of purchaſing a very fair MS. of the Old Teſtament, which coſt, it is ſaid, its weight in ſilver, and which he preſented to Emanuel college. He alſo formed an acquaintance with Antonio de Dominis, archbiſhop of Spalato, and communicated to him ſeveral corrections of his book "De Republica Eccleſiaſtica," afterwards printed in London. Upon his leaving Venice, after a reſidence of eight years, he received from father Paul, as tokens of his eſteem and friendſhip, his picture, and ſeveral valuable books, together with a MS. copy of his famous hiſtory of the council of Trent, his hiſtories of the Interdict and Inquiſition, and a collection of letters. At Edmundſbury, where he ſettled upon his return to England, he employed himſelf in tranſlating the hiſtories of the Interdict and Inquiſition, and the two laſt books of the hiſtory of the council of Trent into Latin, the two firſt having been tranſlated by ſir Adam Newton. In 1615, Bedell was preſented by ſir John Jermyn to the living of Horingſheath, in the ſee of Norwich; but having ſcruples about paying the fees of induction, which he regarded as a ſpecies of ſimony, he declined accepting it; however, he was afterwaads admitted without fees, and lived in this pariſh for twelve years unnoticed. To ſuch a degree, indeed, was he diſregarded, that when Diodati, a famous divine of Geneva, came to England, he diſcovered his place of abode by mere accident. Bedell was introduced by Diodati to Morton biſhop of Durham, as the eſteemed friend of father Paul, and was treated by him with peculiar reſpect. In this obſcure retreat he evinced his talents by the publication of ſome letters which had paſſed between him and James Wadeſworth, formerly his fellow-collegian, but ſince become a convert to popery, and a penſioner of the inquiſition at Seville, concerning the authority of the church of Rome. Theſe letters were dedicated to king Charles I. then prince of Wales, in 1624. In this work there was a paſſage which juſtified reſiſtance to tyrannical princes. Whilſt the author lived, the paſſage eſcaped animadverſion; before the treatiſe was reprinted in 1685, in order to be bound up with biſhop Burnet's life of Bedell, it could not obtain the licence of ſir Roger l'Eſtrange, till ſome words were introduced which made the paſſage appear like a reference to arguments that were uſed by others. In 1627, Bedell was elected provoſt of Trinity college, Dublin, which he was conſtrained to accept by the king's ſpecial command. Upon his return to England, for the purpoſe of taking over his family, he had ſerious thoughts of reſigning his poſt; but he was purſuaded to retain it by an encouraging letter from the primate, Uſher. He then engaged in the diſcharge of the duties of his ſtation with vigour and activity, and was eminently uſeful in compoſing diviſions among the fellows, eſtabliſhing diſcipline, and promoting religion by weekly ſermons on the church catechiſm, which he formed into learned lectures of divinity and morals. In this employment he continued about two years, when, by the intereſt of ſir Thomas Jermyn, and the application of biſhop Laud, he was advanced to the ſees of Kilmore and Ardagh. He was conſecrated at Drogheda in September 1629, being then in the 59th year of his age. In this new ſtation he had to encounter many difficulties; but he determined to adopt plans of reformation, and to correct the abuſes and diſorders that had prevailed to a very great degree in his dioceſe. In order to ſecure ſucceſs in his laudable deſign, and the more effectually to aboliſh pluralities, he ſet an example of moderation by ſeparating the ſee of Ardagh from that of Kilmore, though he had been at a conſiderable expence in recovering ſome of its revenues; theſe fees, however, have been ſince re-united, and have ſo continued. After the compromiſe of a diſpute, which had occurred between him and lord Wentworth, afterwards lord Strafford, who was appointed lord deputy of Ireland in 1633, on

on account of his having ſubſcribed a petition addreſſed to him for the redreſs of certain grievances, Bedell proceeded without interruption in his epiſcopal duties and reforms. In the exerciſe of his epiſcopal functions, he adhered ſtrictly to the rubric; but in caſes that depended on his own determination, he appeared to be jealous of all approaches to ſuperſtition. He was extremely aſſiduous in preaching, catechiſing, and employing all means for diſſeminating religious knowledge; and though he never perſecuted the papiſts, he was the moſt formidable opponent they had in Ireland. He converted ſeveral of their clergy by argument; and laboured to bring over the natives by diſperſing among them the ſcriptures, with popular tracts in their own language, and by cauſing the common-prayer in Iriſh to be read every Sunday in his own cathedral. Biſhop Bedell ſeems to have conſidered the theological differences that ſubſiſted among Proteſtants in his time as of little moment; and it was his wiſh to promote the well-intended project of Mr. Drury for effecting a reconciliation between the Calviniſts and Lutherans.

The character of biſhop Bedell was held in ſuch high eſtimation among the Iriſh, that when the rebellion broke out in 1641, the moſt barbarous of them were known to declare, that he would be the laſt Engliſhman whom they would expel the country. His houſe in the county of Cavan was an unmoleſted aſylum for many Proteſtants who were driven from their own habitations; and he treated them with hoſpitality and kindneſs, exhorting them at the ſame time by prayers and religious diſcourſes, to prepare for the diſtreſs that threatened them. His declared reſolution not to diſmiſs theſe refugees from his houſe, and to ſhare the fate that awaited them, occaſioned his being removed, with his two ſons and ſon-in-law, to a ruinous caſtle in the midſt of a lake where they ſuffered much from the ſeverity of the weather. The biſhop and his ſons were inceſſant in preaching and praying with their diſtreſſed companions: and their piety inſpired the bigotted and rude Iriſh who guarded them with ſuch reſpect, that they never diſturbed their devotions. At length they were removed from this place to the houſe of an Iriſh miniſter, and a convert to proteſtantiſm, where the biſhop was ſeized with a fever, which terminated his life, February 7, 1641-2, in the 71ſt year of his age. At the ſolemnity of his interment, the Iriſh attended with great decency, and fired a volley over his grave; exclaiming in Latin, "Requieſcat in pace ultimus Anglorum! May the laſt of the Engliſh reſt in peace!" And a popiſh prieſt who attended on the occaſion, is ſaid to have paid him a tribute of reſpect and veneration, in the following wiſh: "O ſit anima mea cum Bedello! May my ſoul be with that of Bedell!"

The character of Bedell, delineated by Mr. Clogy, who reſided in his family, and recorded in biſhop Burnet's life of this prelate, appears to have been in a very eminent degree exemplary and amiable: ſo that in the moſt appropriate ſenſe of the terms, he was a primitive and apoſtolical biſhop. His venerable and ſimple aſpect and habit; his indefatigable zeal in diſcharging his duty through all the viciſſitudes of his life; his profound and unaffected learning, diſplayed however in various ways, and manifeſted on a particular occaſion at the table of the earl of Stratford, which produced the witticiſm of the primate archbiſhop Uſher, after the biſhop had continued long ſilent, according to his uſual manner, "Broach him, and you will find good liquor in him;" his charity and hoſpitality, exhibited in the ſupply afforded by him to many poor Iriſh families, ſome of whom he entertained at Chriſtmas at his own table, and in the ſeaſonable relief which the perſecuted proteſtants obtained in his houſe; his detachment from worldly intereſt, of which an inſtance, ſelected from many more, has been given in the ſeparation of the ſees of Kilmore and Ardagh; his integrity and honour, and his pious reſignation under all the evils of life, in the obſcurity of his humbler ſtation, and amid the perſecutions which he ſuffered after the attainment of a higher rank;—all theſe qualities, which have been amply illuſtrated in the memoirs of his life, exalted his character to the higheſt degree of profeſſional excellence. His bequeſts at his death correſponded to the uniform tenor of his life; for out of his very limited fortune he allotted ſome legacy to every place to which he had any relation. He thus obtained the eſteem of the moſt bitter enemies of his faith and country, while he lived, and he has alſo ſecured the veneration of poſterity, and left a model for the imitation of all his ſucceſſors. He ſtudied and wrote much on the controverſy between the papiſts and proteſtants, and he had compoſed a large treatiſe in anſwer to the two queſtions, addreſſed by the former to the latter with a kind of triumph; "Where was your religion before Luther? and, What became of your anceſtors who died in popery?" But this treatiſe, which the biſhop intended to have printed, together with many other MSS., were loſt in the confuſion of the times. His Hebrew MS. Bible was preſerved, and is now repoſited in Emanuel college, Cambridge, to which the author bequeathed it.

As biſhop Bedell objected to burial in churches, partly becauſe it indicated ſuperſtition and pride, and partly becauſe the putrid effluvia of dead bodies annoyed the living, he gave orders for burying his wife in the leaſt frequented part of the church-yard of Kilmore, and directed by his will that he ſhould be placed near her. By his wife, who was of the ancient and honourable family of L'Eſtrange, he had one daughter and three ſons, of whom two ſurvived him; one provided for by a ſmall benefice of 80l. a year, beſides the entailed eſtate of the family in Eſſex, and the other by a ſmall eſtate of 60l. a year, the only purchaſe made by the father. Biog. Brit.

BEDENGIAN, in *Botany*, a name given by Avicenna and Serapion to the *poma amoris*, or *love-apples*, a ſort of fruit uſed in food by the Italians, and ſome other nations, and ſeeming to be the third kind of the *ſtrychnos*, or *ſolanum*, mentioned by Theophraſtus. That author firſt deſcribes two kinds of this plant, the one of which occaſioned ſleepy diſorders, and the other threw people who eat of it into madneſs. After theſe, which he properly accounts poiſonous kinds, he mentions a third, which was cultivated in gardens, for the ſake of the fruit, which, he ſays, is large and eſculent. This is certainly the ſame with *bedengian*, or *poma amoris*.

BEDER, in *Ancient Geography*. See Bedr.

Bedar, in *Geography*, a fortified city of Hindooſtan, in the territory of the Nizam, about 80 road miles N.W. of Hydrabad; was formerly the capital of a conſiderable kingdom, and is now celebrated for the number and magnificence of its pagodas. N. lat. 18°. E. long. 78°.

BEDFORD, Arthur, in *Biography*, was the ſon of Richard Bedford, and was born at Tiddenham in Glouceſterſhire, 1668. Having received the rudiments of learning from his father, he was, in 1684, at the age of ſixteen, admitted a commoner of Brazen Noſe college, Oxford, where he acquired ſome reputation as an orientaliſt. In 1688 he received holy orders from the biſhop of Glouceſter. About this time he removed to Briſtol, where the mayor and corporation preſented him to the vicarage of Temple church. At Briſtol he ſtaid a few years, devoting a great portion of his time to the ſeconding Mr. Collier's attack upon the ſtage; he was involved, indeed, in a very briſk controverſy with ſeveral of the greateſt wits and ableſt writers of the age, but acquitted himſelf

himſelf with ſo much force and vivacity, as actually to produce both repentance and amendment, and was a great cauſe of that decorum which has for the moſt part been obſerved by the modern writers of dramatic poetry. From Briſtol he went to a ſmall living in Somerſetſhire, where he employed himſelf in a work on ſcripture chronology, which, in conſequence of ſir I. Newton's labour, he afterwards relinquiſhed for a time, and was engaged to aſſiſt in correcting an Arabic verſion of the Pſalter and New Teſtament, for the benefit of the poor Chriſtians in Aſia. In 1719, he communicated his thoughts to Dr. Charlet, in regard to the foundation of a Syriac profeſſorſhip at Oxford. The letter which contained them is a moſt excellent production, and is printed at length in Mr. Ellis's Hiſtory of Shoreditch, where he became chaplain to Aſke's hoſpital, in 1724. About 1730, he renewed his attack upon the ſtage, particularly directed againſt a new playhouſe in Goodman's fields, where Garrick made his firſt appearance. From this period, to the time of his death, we know few particulars of conſequence; but the 15th of September, 1745, cloſed a life that had been very uſeful. Beſides many ſingle ſermons, and his tracts upon the playhouſe, his chief publications were, "The Temple of Muſic:" 1706, 8vo. "The abuſe of Muſic;" 1711, 8vo. "Eſſay on ſinging David's Pſalms;" 1708. "Animadverſions on Sir Iſaac Newton's Chronology;" 1728, 8vo. "Scripture Chronology;" 1730, fol. "The Doctrine of Juſtification by Faith, in Nine Queſtions and Anſwers;" 1741, 8vo: and "Horæ Mathematicæ vacuæ;" 1743, 8vo.

Bedford, in *Geography*, the county town of Bedfordſhire, in England, is ſeated on the banks of the river Ouſe, nearly in the centre of the county, at the diſtance of 51 miles N.W. from London. It is a place of ſome antiquity, and was called by the Saxons *Bedan-ford*, or Bedician Forda, ſignifying the fortreſs on the ford. At the time of Offa, that powerful king of the Mercians, Bedford was probably of ſome note, as this monarch directed his corpſe to be interred in a ſmall chapel here, which, being ſeated on the river Ouſe, was carried away by the floods during an inundation. In the year 572, a pitched battle was fought here between Cuthwolf the Saxon, and the Britons; when the latter were defeated, and obliged to deliver up ſeveral of their towns to the haughty conqueror. During the Daniſh wars, this town ſuffered materially by the ravages of theſe plundering marauders; but in the year 911, they were ſeverely beaten, and driven from this neighbourhood. A ſtrong Norman caſtle was erected here by Pagan de Beauchamp, the third baron of Bedford, who fortified it with a deep intrenchment and lofty wall. "While it ſtood," ſays Camden, "there was no ſtorm of civil war which did not burſt upon it." King Stephen laid ſiege to, and conquered this caſtle; and, according to Camden, ſlaughtered the inhabitants; but other hiſtorians aſſert that he granted them honourable terms. During the conteſts between king John and his barons, it was ſeized by the latter, but reconquered again by the forces under Fulco de Brent, to whom it was given by the king as a reward for his ſervices. This rebellious villain occaſioned his own deſtruction with that of the caſtle, by oppoſing Henry III. who laid ſiege to the fortreſs, and after a conteſt of ſixty days, made himſelf maſter of this "nurſery of ſedition." De Brent was ſent to London and impriſoned, but his brother and twenty-four other knights were executed on the ſpot. (For an account of this ſiege, ſee Beauties of England and Wales, vol. i. p. 6.) The embankments of the caſtle form a parallelogram; ſome of which may be eaſily traced; but the walls are entirely raſed to the ground.

The *government* of the town is veſted in a mayor, recorder, deputy recorder, an indefinite number of aldermen, two bailiffs, and thirteen common councilmen. The bailiffs are lords of the manor, and have the right of fiſhing in Ouſe for an extent of nine miles each way from Bedford. Henry III. granted the *borough* to the burgeſſes for 40l. yearly: Edward I. ſeized it for the crown rents, which the burgeſſes had neglected to diſcharge. The laſt renewal of their charter was in the reign of James II. when the mayor and aldermen were removed from their reſpective offices by a royal mandate, for not electing two burgeſſes to ſerve in parliament. The members were in conſequence choſen by his majeſty's miniſters. The right of election is now veſted in the burgeſſes, freemen, and inhabitant houſeholders not receiving alms, amounting to nearly 1400.

This town is ſeated in a fertile tract of land, called the vale of Bedford, which accompanies the Ouſe, and produces abundant crops of wheat, barley, turnips, &c. The land on the north ſide of the river is a ſtrong clay, that on the ſouth ſide is much lighter, yet very productive, and its natural fertility is much increaſed by the overflowing waters of the Ouſe. This river flows through, and divides the town, which is connected by a ſtrong old ſtone bridge. On the centre of this ſtood the old town gaol, which was taken down about thirty-three years ſince. The river was made navigable to Lynn in Norfolk, by act of parliament. Bedford contains five diſtinct pariſhes, and an equal number of churches, two of which are on the ſouth ſide of the river, and three on the north ſide. Of theſe St. Paul's is the principal for ſize and architecture, having a handſome octagonal ſtone ſpire. It was collegiate before the conqueſt. Here are four meeting-houſes, appropriated to different religious ſects, beſides one for the Methodiſts, and another for Moravians. To the latter is attached a dwelling-houſe for maiden ladies of this ſect, called the ſingle ſiſters' houſe.

This town is diſtinguiſhed by many charitable endowments. The hoſpital of St. John is ſuppoſed to have been founded in 980 by Robert Deparis, who was the firſt maſter. It now conſiſts of a maſter, who is rector of St. John's, and ten poor men. St. Leonard's hoſpital was built and endowed towards the end of the reign of Edward I. The hoſpital of Grey Friars was founded in the reign of the ſucceeding monarch by the lady Mabilia de Paterſhall, who was buried in the cemetery. Mr. Thomas Chriſty repaired the old town-hall, founded an hoſpital for eight poor people, and endowed a charity ſchool for forty children. But the moſt conſiderable charity of this town, and one whoſe augmented revenues have been aſtoniſhingly great, was bequeathed by Sir *William Harpur*, whoſe name and benevolence it perpetuates. This gentleman was a native of Bedford, and made lord mayor of London in 1561. He purchaſed for 180l. thirteen acres and one rood of land lying in the pariſh of St. Andrew, Holborn, London. This, with his dwelling-houſe in Bedford, he gave to the corporation of that town, for the endowment of a ſchool and for apportioning young women of the town upon marriage. The annual rent of the above land was only 40l. at firſt; in 1668 it was leaſed for forty-one years at the annual rent of 99l. A reverſionary leaſe was granted for a further term of fifty-one years at the increaſed rent of 150l. A number of ſtreets, rows, and courts, were then built on the leaſed ground, and the annual rent is now 4000l. which in three or four years is expected to increaſe at leaſt another thouſand. In conſequence of this almoſt unparalleled augmentation of revenue, the truſtees have applied to parliament for two different acts, to extend the objects of the charity, and regulate the application of the receipts. The ſchool endowed by it is ſituated near St. Paul's church, having over the door a ſtatue in white marble of the founder, and a Latin inſcription beneath. Beſides the above charities a *houſe of induſtry* has lately been opened for the reception of all the poor of the five

five consolidated parishes. A new town gaol has lately been erected, and a county gaol is just finished; towards the completion of which the late Mr. Whitbread left a legacy of 500l. This town contains 800 houses and 3948 inhabitants.

Bedford was made a dukedom by Henry the fifth, who constituted John Plantagenet, third son of Henry the fourth, the first duke. After being enjoyed by a Nevil, and a de Hatfield, it was bestowed on John Russell, in whose family it still continues. See Russel.

At Elstow, about one mile from Bedford, was an abbey of benedictine nuns, founded by Judith, niece to the conqueror. At the dissolution its revenues were valued at 284l. 12s. 11¾d. The church of Elstow is a very fine ancient building, with a detached tower. This place gave birth to John Bunyan in the year 1628. His allegory of the Pilgrim's Progress was written during confinement in the county gaol. See Bunyan. Beauties of England and Wales, vol. i.

Bedford, a township of America, in Hillsborough county, New Hampshire, incorporated in 1750, and containing 898 inhabitants. It lies on the west bank of Merrimack river, 56 miles west of Portsmouth.

Bedford, a township in Middlesex county, Massachusetts, containing 523 inhabitants, 13 miles northerly from Boston.

Bedford, *New*, a flourishing town of Bristol county, in Massachusetts, containing 3313 inhabitants, lying at the head of navigation on Accushnet river, 58 miles southward of Boston. N. lat. 40° 41′. W. long. 70° 52′.

Bedford, a township of West Chester county, in the state of New York, containing 2470 inhabitants, including 38 slaves. It lies contiguous to Connecticut, 12 miles N. from Long Island sound, and 35 from the city of New York. In the census of 1796, it appeared to have 322 electors.

Bedford, a town on the west end of Long Island in New York, 4 miles N. W. from Jamaica bay, and 6 E. from the city of New York.

Bedford, a village near the Georgia side of Savannah river, 4 miles above Augusta.

Bedford, a county of Pennsylvania, lying on Juniatta river, and having part of the state of Maryland on the south, and Huntingdon county north and north-east. It contains 13,124 inhabitants, including 46 slaves; half of its lands is settled, and it is divided into nine townships. Bedford, the chief town of this county, lies on the south side of Raystown branch of the same river, 25 miles E. of Berlin, and 210 W. of Philadelphia. It is regularly laid out, and has a stone gaol, and a market-house, court-house, and record-office built of brick. It was incorporated in 1795. N. lat. 40°. W. long. 78° 50′.

Bedford, a county of Virginia, is separated from that of Amherst on the north by James river, and has Campbell on the east, Botetourt on the west, and Franklin county on the south. It is 34 miles long, 25 broad, and contains 10,531 inhabitants, including 2,754 slaves. Its soil is good, and it is agreeably diversified with hills and vallies. In some parts chalk and gypsum have been discovered. The chief town is New London.

Bedford's *bay*. See Torrington's *bay*.

Bedford, *Cape*, is more than 80 leagues E. by N. from the west entrance of Baffin's straits, and the S. E. point of James's island; its latitude is more than 68°, and it forms one of the western limits of Davis's straits.

Bedford, *Cape*, is also the extreme north-east point of the coast of New Holland, opening to the south-west into Endeavour river, in S. lat. 15° 18′. E. long. 145° 15′. The sea to the east and north is almost every where full of shoals and reefs.

Bedford Level, is the name given to a large tract of fenny, boggy land in England, which remained a steril waste for many ages. It was calculated to contain 400,000 acres, distributed through the several counties of Cambridge, Huntingdon, Northampton, Lincoln, Norfolk, and Suffolk. The chief part of this extensive tract appears, from the various phenomena noticed by different authors, to have been formerly a dry and cultivated land; but either from injudicious embankments, which prevented the waters from the uplands issuing at their proper outlets, or from sudden and violent convulsions of nature, it was reduced to the state of a morass; where the waters, stagnating and becoming putrid, filled the air with noxious exhalations; and not only destroyed the health of the inhabitants, but likewise impeded their endeavours to obtain the necessaries of life; the country being almost rendered impassable even to boats, by the sedge, reeds, and slime with which it was covered. The name given to it originated with Francis earl of Bedford, who having large possessions in the fens, mostly granted him by Henry the eighth, upon the dissolution of monasteries, engaged, in conjunction with thirteen other gentlemen, to drain the whole upon the condition of having 95,000 acres in the result of successful accomplishment. These terms were acceded to by the commissioners and the country at large, and in 1634 the king granted these adventurers a charter of incorporation. In the course of three years and a half this Herculean task was completed to the satisfaction of the commissioners, who, with the king's surveyor, set out the allotted land to the corporation. Above 100,000l. was expended upon this work. The king, and some persons devoted to his interest, afterwards opposed the right of the earl of Bedford, and dispossessed him of his property. Other persons engaged in the concern, but the civil wars breaking out frustrated all their schemes, and in 1649, William earl of Bedford, the heir and successor of Francis, was restored by the convention-parliament to all the rights of his father. A new act was obtained to repair the decayed works, and extensive operations were adopted. In 1653 the level was adjudged to be fully drained, and after the adventurers had expended 400,000l. more, the 95,000 acres were confirmed to them. In 1697 the Bedford level was divided into three districts, called north, middle, and south, having one surveyor for each of the former, and two for the latter. This distribution, intended for its better government, proved a cause of considerable opposition and contention, and it was many years before the whole was settled in a systematic and equitable manner. To pursue the history of those litigations, charters, and laws, originating in, and made for this great concern, would lead us into a narrative too extensive for the limits of our work: we must therefore refer those persons, desirous of further information, to the "Beauties of England and Wales," vol. ii. and to a work recently published, entitled "An historical Account of the Bedford Level," with the laws, &c. relating to the same, 8vo.

That this vast tract was at some former period dry habitable land, is evident from the quantity of trees and various other natural and artificial substances that have been dug from different depths in various parts of it. Dugdale, in his "History of Embanking," states that many oak, fir, and other trees, were found in draining the isle of Axholm. These were at the depths of three, four, and five feet from the surface, lying close to the roots, which were in firm earth below the moor. The bodies or boles of the trees appeared to have been burnt asunder (not cut down with saws or axes) as the ends of them being *coaked* do manifest. The oaks were lying

lying in multitudes, and of an extraordinary size, being five yards in compass, and sixteen yards long; and some smaller of a great length, with a great quantity of acorns and small nuts near them. Other authors relate similar facts; and Mr. Elstob, in his "Historical Account of the Bedford Level," states that in the year 1764 many roots of trees, standing as the trees had grown, were found near Boston in Lincolnshire at the depth of eighteen feet below the thin pasturage surface. Tacitus, in his life of Agricola, relates, that "the Britons complained of their hands and bodies being worn out and consumed by the Romans, in *clearing the woods* and *embanking the fens*." This sentence seems particularly applicable to the forementioned circumstances, and alludes to the period when some great operations of this nature were exacted from the enslaved Britons. The emperor Severus is said to have been the first who intersected the fens with causeways: one of which is described by Dugdale as extending about 24 miles from Denver in Norfolk to Peterborough. It was composed of gravel three feet in depth and sixty feet wide, and about five feet beneath the surface. In 1635 some workmen discovered, at eight feet below the bottom of Wisbech river, a second stony bottom, with seven boats lying in it covered with silt; and at Whittlesea, on digging eight feet beneath the surface, a perfect soil was found with swaths of grass on it; as they lay when first mowed. Near Boston, at the depth of sixteen feet, were discovered a smith's forge, with many of his tools, some horse shoes and other iron articles. Various other things have been found at different times, and in different places, all tending to prove the extraordinary effects that nature has produced here in one of her revolutions. The cause and time of this event are not recorded. Henry of Huntingdon, who wrote in the time of king Stephen, describes this part of the country as then "very pleasant and agreeable to the eye, watered by many rivers which run through it, diversified with many large and small lakes, and adorned with many woods and islands." William of Malmsbury, living in the first year of Henry II. describes the district in glowing colours, as "a very paradise; for that in pleasure and delight it resembled heaven itself; the very marches abounding in trees, whose length without knots do emulate the stars. There is not any *waste* place in it; for in some parts thereof there are apple trees; in others vines, which either spread upon the grounds, or run along the poles." From these testimonies it appears that the *great inundation* of the fens must have occurred after the time of the latter historian. The first attempt at draining them was in the reign of Edward I.; since which time numerous schemes have been proposed, and tried to render this large tract of country subservient to agriculture.

BEDFORDSHIRE, one of the inland counties of England, bounded on the north by Huntingdonshire and Northamptonshire, on the west by Buckinghamshire, on the south by Hertfordshire, and on the east by part of the latter, and Cambridgeshire. Its limits are very irregular and artificial, having only two short spaces of the Ouse as natural boundaries on the east and west.

This part of the kingdom, with the districts now called Hertfordshire and Buckinghamshire, were inhabited at the time of the Roman invasion, by a tribe of Britons called Catticuchlani, whose chief or governor Cassivellaunus, was chosen by unanimous consent to lead them against the arrogant invading Cæsar. In the year 310 the emperor Constantine divided this island into five Roman provinces, when Bedfordshire was included in the third division, called Flavia Cæsariensis. At the establishment of the Mercian kingdom it was made part of that government, and continued so till the year 827, when, with the other divisions of the island, it became subject to the west Saxons under Egbert. Alfred having subdivided his kingdom into shires, hundreds, and tythings, and marked the limits and name of each division, this was called Bedefordscire, since contracted to its present name. Its length is computed at 35 miles, and breadth at 20. It contains an area of about 260,000 acres, which are divided into nine hundreds, containing ten market towns, 124 parishes, 58 vicarages, 550 villages, about 12,000 houses, and nearly 64,000 inhabitants.

The face of the country, though not characterised by high hills and deep vallies, is considerably diversified with some inequalities of surface, and on the southern side is a range of chalk hills. Beneath these is an extensive tract of cold, steril land. The western side of the county is mostly sandy and flat, yet, from the improvements adopted and recommended by the duke of Bedford, lord Ossory, &c. the greatest part is appropriated to some species of agriculture. On the north and north-east the soil is a deep loam, famous from the skill employed in its cultivation, for producing large crops of corn, particularly barley. A large proportion of the land in this county had long continued in open or common fields, but within the last five or six years great quantities have been inclosed, and farther inclosures are intended. The chief employment for the lower classes of persons in this county arises from agriculture, making of lace, and the manufacturing of straw hats. In the two latter, numbers of women and children are constantly occupied, and from them derive a bare subsistence. There is no such thing as *bone lace* made in the county, and the *fuller's earth* pits are all in Buckinghamshire. Bedfordshire is watered by the rivers Ouse and Ivel, and some smaller streams. The former enters the county on the western side, and after a devious course through many fine meadows, passes through the town of Bedford, where it becomes navigable. Flowing eastward it leaves the county at St. Neot's, on the confines of Huntingdonshire. (See Ouse). The river Ivel rises in Hertfordshire, and passing Baldock and Biggleswade, falls into the Ouse a little above Tempsford.

Bedfordshire is in the Norfolk circuit, in the province of Canterbury, and bishopric of Lincoln. It is crossed by two Roman roads, the Watling-street and the Ichnild-way, and contains some encampments attributed to that people: one at Sandy, near Potton, called Salenæ, and another near Dunstable, called Maiden-bower, supposed to be the magiovinum of Antoninus. The duke of Bedford has a magnificent seat at Wooburn Abbey in this county. Luton Hoo, the marquis of Bute's; Ampthill Park, lord Ossory's; and Wrest-house, lady Lucas's, are very fine seats in the county. Beauties of England and Wales, vol. i.

BEDIRUM, or Bedeiron, in *Ancient Geography*, a town of Africa, in the interior of Libya. Ptolemy.

BEDKA, in *Geography*, a town of European Turkey, in the Sangiakship of Belgrade, seated on the Kolubra.

BEDNORE, or Biddanore, a fine province of Hindoostan, lying north-west of the Mysore country, and deriving its name from Bednore, the capital. Hyder Ally took possession of this province about the year 1763; and it was afterwards comprehended within the dominions of his son Tippoo Sultan, who styled himself regent of Mysore, and who retained it till the time of his death in 1799, when, after the capture of Seringapatam by the British troops, his dominions were distributed among the conquerors. Part of Biddanore was assigned to the Mahrattas; the sons and relations of Tippoo were removed into the Carnatic; and a descendant of the ancient rajahs of Mysore, about five years old, was placed upon the throne, under certain conditions.

Bednore, a city of Hindoostan, and capital of the forementioned province. N. lat. 13° 47′. E. long. 75° 7′.

Bednore,

Bednore, Ranny, a town of Hindoostan, seated on the Toombuddra river, in the territory belonging, by the treaty of 1792, to the Mahrattas. N. lat. 14° 35′. E. long. 75° 42′.

BEDOWEENS or Bedouins, in Arabic *Bedouai*, formed of *bid*, desert, or country without habitations, a denomination given to a wandering tribe of Arabs, who retain the customs and manners of their ancestors, the "Arabes Scenitæ," and who are said to be descended from Ishmael. They originate from the deserts of Arabia, where they live in tents, and are separated into distinct tribes, subject to their scheiks, who direct and superintend in every transaction: and they have migrated with their flocks and herds into Egypt and Syria, and other countries both of Asia and Africa, inhabiting the vast deserts which extend from the confines of Persia to Morocco. They select those spots which afford them springs and pastures, and they are in the strictest sense a race of rovers or wanderers, without any permanent abode.

Although they are divided into independent communities, or tribes, not unfrequently hostile to each other, they may still be considered as forming one nation. The resemblance of their language is a manifest token of this relationship. The only difference that exists between them is, that the African tribes are of a less ancient origin, being posterior to the conquest of these countries by the caliphs or successors of Mahomet: while the tribes of the deserts of Arabia, properly so called, have descended by an uninterrupted succession from the remotest ages.

The Arabs, says M. Volney, seem to be especially condemned to a wandering life, by the very nature of their deserts. To paint to himself these deserts, the reader must imagine a sky almost perpetually inflamed, and without clouds, immense and boundless plains, without houses, trees, rivulets, or hills, where the eye frequently meets nothing but an extensive and uniform horizon like the sea, though in some places the ground is uneven and stony. Almost invariably naked on every side, the earth presents nothing but a few wild plants thinly scattered, and thickets, whose solitude is rarely disturbed but by antelopes, hares, locusts, and rats. Such is the nature nearly of the whole country, which extends 600 leagues in length, and 300 in breadth, and stretches from Aleppo to the Arabian sea, and from Egypt to the Persian gulf. The soil, however, varies considerably in different places; and this variety in the qualities of the soil is productive of some minute differences in the condition of the Bedoweens. In the more sterile countries, or those which produce few plants, the tribes are feeble and very distant; which is the case in the desert of Suez, that of the Red Sea, and the interior of the Great Desert, called the Najd. Where the soil is more fruitful, as between Damascus and the Euphrates, the tribes are more numerous and less distant from each other; and in the cultivable districts, such as the pachalics of Aleppo, the Hauran, and the neighbourhood of Gaza, the camps are frequent and contiguous. In the former case the Bedoweens are merely pastors, and subsist only on the produce of their herds, and on a few dates and flesh-meat, which they eat, either fresh, or dried in the sun, and reduced to a powder. In the latter they sow some land, and add cheese, barley, and even rice to their flesh and milk. Such is the situation in which nature has placed the Bedoweens, to render them a race of men equally singular in their physical and moral character. This singularity is so striking, that even their neighbours, the Syrians, regard them as extraordinary beings; especially those tribes which dwell in the depths of the deserts, such as those of Anaza, Kaibar, Tai, and others, which never approach the towns. In general, the Bedoweens are small, meagre, and tawny; more so, however, in the heart of the desert, than on the frontiers of the cultivated country; but they are always of a darker complexion than the neighbouring peasants. They also differ among themselves in the same camp: the scheiks, that is, the rich, and their attendants, were always taller, and more corpulent than the common class. Some of them are more than five feet five inches high; though in general they do not exceed five feet two inches. This difference can only be attributed to their food, with which the former are more abundantly supplied than the latter. The Bedoweens of the lower class live in a state of habitual wretchedness and famine: and it is an undoubted fact, that the quantity of food consumed by each of them does not exceed six ounces a day. This abstinence is most remarkable among the tribes of the Najd and the Hedjaz. Six or seven dates soaked in melted butter, a little fresh milk, or curds, serve a man a whole day, and he thinks himself happy when he can add a small quantity of coarse flour, or a little ball of rice. Meat is reserved for the greatest festivals, and they never kill a kid but for a marriage or a funeral. A few wealthy and generous scheiks only can kill young camels, and eat baked rice with their victuals. In times of dearth the vulgar, half-famished, eat locusts, rats, lizards, and serpents, which they broil on briars.

It has been already observed, that the Bedoween Arabs are divided into tribes, which constitute so many distinct nations. Each of these tribes appropriates to itself a certain tract of land, and is collected in one or more camps, which are dispersed through the country, and which make a successive progress over the whole, in proportion as it is exhausted by the cattle. Such is the law among them, that if a tribe, or any of its subjects, enter upon a foreign territory, they are treated as enemies and robbers, and a war ensues. Moreover, as all the tribes have affinities to each other by alliances of blood or treaties, leagues are formed which render these wars more or less general. As soon as the offence is made known, they mount their horses, and seek the enemy; when they meet, they enter into a parley, and the dispute is frequently compromised; if not, they attack either in small bodies, or man to man. They encounter each other at full speed with fixed lances, which they sometimes dart, notwithstanding their length, at the flying enemy; the victory is rarely contested; it is decided by the first shock, and the vanquished fly off at full gallop over the naked plain of the desert. The tribe which has been defeated strikes its tents, removes by forced marches to a distance, and seeks an asylum among its allies. The enemy, satisfied with their success, drive their herds further on, and the fugitives soon after return to their former situation. Dissensions, however, are often perpetuated by the slaughter that is made on these occasions; and they have established laws among themselves, that the blood of every man who is slain must be avenged by that of his murderer. This vengeance is called "Tar," or retaliation; and the right of exacting it devolves on the nearest of kin to the deceased. If any one neglects to seek his retaliation, he is for ever disgraced. He therefore watches every opportunity of revenge. If his enemy perishes in any other way, he seeks satisfaction by inflicting vengeance on the nearest relation. These animosities are transmitted, as it were, by inheritance, from father to children, and never cease but by the extinction of one of the families, unless they agree to sacrifice the criminal, or purchase the blood for a stated price, in money or in flocks. Such being the condition of society, most of the tribes live in an habitual state of war; and this circumstance, together with their mode of life, renders the Bedoweens a military people, though they have made no great progress in war as an art. Their camps are formed in a kind of irregular

gular circle, compoſed of a ſingle row of tents, with greater or leſs intervals. Theſe tents, made of goat's or camel's hair, are black or brown, or ſtriped black and white, and thus differ from thoſe of the Turkmans, which are white. They are ſtretched on three or four pickets, only five or ſix feet high, which gives them a very flat appearance; ſo that at a diſtance one of theſe camps appears like a number of black ſpots. To the colour of theſe tents, ſays Dr. Shaw, there is a beautiful alluſion, (Cant. i. 5.) "I am black, but comely like the tents of Kedar." For nothing, adds this writer, can afford a more delightful proſpect than a large extenſive plain, in its verdure, or even ſcorched up by the ſunbeams, with theſe moveable habitations, ſituated in circles upon them. Theſe tents are the ſame with what the ancients called "Mapalia," (Sil. Ital. l. xvii. 90. Lucan. l. iv. 684.) and are repreſented by Salluſt, (Bell. Jug. § 21.) as reſembling the bottom of a ſhip turned upſide down. The length of theſe tents is much greater than their breadth; and they are entirely open on one of their long ſides, that is ſheltered from the wind, and on that which is expoſed they are cloſed. The tent of the ſcheik is in ſome of their encampments diſtinguiſhed from the others merely by a large plume of black oſtrich feathers placed upon its top. Each tent, inhabited by a family, is divided by a curtain into two apartments, one of which is appropriated to the women. In theſe tents the Bedoweens, when they take their reſt, lie ſtretched out upon the ground, without bed, mattreſs, or pillow; wrapping themſelves in their hykes or blankets, and lying upon a mat or carpet, in any part of them, where they can find room. A number of theſe tents, from 3 to 300, are arranged in a circle, and called Douwar. The empty ſpace within the large circle ſerves to fold their cattle every evening. As the ſhade of trees is very agreeable in torrid regions, the Bedoweens in the deſert take pains in ſelecting ſhaded ſituations for their encampments: but thoſe of Egypt encamp on ſpots deſtitute of trees; and when any happen to be there, it is no conſideration with them in the pitching of their tents. They never have any entrenchments, their only advanced guards and patroles are dogs: their horſes remain ſaddled and ready for being mounted on the firſt alarm; but being ſtrangers to all order and diſcipline, theſe camps, always open to ſurpriſe, afford no defence in caſe of an attack. Accidents, therefore, frequently happen, and cattle are carried off every day. The tribes which live in the vicinity of the Turks, are ſtill more accuſtomed to alarms and attacks; for theſe ſtrangers arrogating to themſelves, in right of conqueſt, the property of the whole country, treat the Arabs as rebel vaſſals, or as turbulent and dangerous enemies; and on this principle they never ceaſe to wage ſecret or open war againſt them. The Arabs, on their ſide, regarding the Turks as uſurpers and treacherous enemies, watch every opportunity to do them injury. On the ſlighteſt alarm, the Arabs, confounding the innocent with the guilty, cut their harveſts, carry off their flocks, and interrupt their communication and commerce. Theſe depredations produce a miſunderſtanding between the Bedoweens and the inhabitants of the cultivated country, which renders them mutual enemies. Such is the external ſituation of the Arabs.

As to their internal conſtitution, each tribe is compoſed of one or more principal families, the members of which have the title of ſcheiks, that is, chiefs or lords. One of theſe ſcheiks has the ſupreme command over the others. He is the general of their little army, and ſometimes aſſumes the title of "Emir," which ſignifies commander and prince. The more relations, children, or allies he has, the greater is his influence. To theſe he adds other adherents, whom he attaches to himſelf by ſupplying their wants. Beſides, a number of ſmall families, who, not being ſtrong enough to maintain their own independence, and needing alliances and protection, range themſelves under the banner of this chief. Such an union is called "Kabila," or tribe. Theſe tribes are diſtinguiſhed by the names of their reſpective chiefs, or by that of the ruling family; and when they ſpeak of any of the individuals that compoſe them, they call them the "children" of ſuch a chief; as, e. g. "Beni Temin," "Oulad Tai," the children of Temin and of Tai.

The ſcheiks and their ſubjects are born to the life of ſhepherds and ſoldiers. The more conſiderable tribes rear many camels, which they either ſell to their neighbours, or employ in the carriage of goods, or in their military expeditions. The ſmaller tribes keep flocks of ſheep. Among thoſe tribes which apply to agriculture, the ſcheiks live always in tents, and they leave the culture of their ground to their ſubjects, whoſe habitations are wretched tents. The peculiar diſtinctions which characteriſe their different tribes reſult from their different modes of living. The genuine Arabs diſdain huſbandry, as an employment by which they would be degraded. They maintain no domeſtic animals but ſheep and camels, except, perhaps, horſes. Thoſe tribes which are of a pure Arab race, live on the fleſh of their buffaloes, cows and horſes, and on the produce of ſome little ploughing. The former tribes, diſtinguiſhed as noble, by their poſſeſſion of lands, are denominated "Abu el Abaar;" and the ſecond "Moædan," which are eſteemed a middle claſs, between genuine Arabs and peaſants. Theſe are ſometimes mentioned contemptuouſly, becauſe they keep buffaloes and cows. The "Moædan," tranſport their dwellings from one country to another, as paſturage fails; ſo that a village ſprings up ſuddenly in a ſituation where, on a preceding day, was not to be ſeen a ſingle tent. The genuine Bedoweens, living always in the open air, have a very acute ſmell; and the fetid exhalations produced by cities are one cauſe of their diſlike of them. So acute is their ſmell, that, according to Niebuhr, if they are carried to the ſpot from which a camel has ſtrayed, they will follow the animal by ſmelling its track, and diſtinguiſh the traces of its footſteps from thoſe of other animals that have paſſed the ſame way. Thoſe Arabs who wander in the deſert will ſubſiſt five days without drinking, and diſcover a pit of water by examining the ſoil and plants in its environs. Like other people that lead an erratic life, they are addicted to robbery, and of courſe are formidable enemies to thoſe who traverſe the deſerts; but they never murder thoſe whom they rob, unleſs travellers in their own defence ſhould chance to kill a Bedoween, in which caſe the others are eager to revenge his death. Upon all other occaſions they act in a manner conſiſtent with their natural hoſpitality. Of their hoſpitality Niebuhr has recorded ſeveral very pleaſing inſtances. The pillaging of the caravans, he ſays, is not always owing merely to their propenſity for robbing, but their expeditions for this purpoſe are commonly conſidered by themſelves as lawful hoſtilities againſt enemies, who would defraud the natives of their dues, or againſt rival tribes, who have undertaken to protect thoſe illegal traders.

The government of the Bedoweens is at once republican, ariſtocratical, and even deſpotic. It is republican, as the people have great influence, and nothing can be tranſacted without a majority: it is ariſtocratical, becauſe the families of the ſcheiks poſſeſs ſome of the prerogatives which every where accompany power: and it is deſpotic, becauſe the principal ſcheik has an indefinite, and almoſt abſolute authority, which he may abuſe; though the ſtate of the tribes confines this abuſe within very narrow limits; for if he ſhould kill an Arab, it would be almoſt impoſſible for him to

eſcape

escape punishment, and the law of retaliation would be in force. His subjects, harassed by severity, would abandon him and join another tribe; his own relations would depose him, and advance themselves to his station. The dignity of scheik is hereditary, but not confined to the order of primogeniture; the petty scheiks, who form the hereditary nobility, chuse the grand scheik out of the reigning family, without considering his immediate relation to his predecessor. Little or no revenue is paid to the grand scheik. In fact, the principal scheik in every tribe defrays the charges of all who arrive at or leave the camp. His rank subjects him to great expence by the entertainment of his allies, and of the principal men, who assemble to deliberate concerning encampments and removals, peace and war, and the litigations between individuals. To these he must give coffee, bread baked on the ashes, rice, and sometimes roasted kid or camel. In a word, he must keep open table. On his generosity depend his credit and his power. To provide for these expences, the scheik has nothing but his herds, a few spots of cultivated ground, the profits of his plunder, and the tribute he levies on the high roads, the total of which is very inconsiderable. The most powerful scheiks among the Bedoweens, though sometimes denominated princes and lords, may be compared to substantial farmers, whose simplicity they resemble in their dress, as well as in their domestic life and manners. A scheik, who has the command of 500 horse, does not disdain to saddle and bridle his own, nor to give him his barley and chopped straw. In his tent, his wife makes the coffee, kneads the dough, and superintends the dressing of the victuals. His daughters and kinswomen wash the linen, and go with pitchers on their heads, and veils over their faces, to draw water from the fountain. These manners agree precisely with the description in Homer, and the history of Abraham in the book of Genesis.

The simplicity, or rather poverty of the lower class of the Bedoweens, corresponds to that of their chiefs. The whole wealth of a family consists of moveables, of which the following is a pretty exact inventory. A few male and female camels, some goats and poultry, a mare with her bridle and saddle, a tent, a lance 16 feet long, a crooked sabre, a rusty musket, with a flint or matchlock, a pipe, a portable mill, a pot for cooking, a leathern bucket, a small coffee-roaster, a straw mat, which serves equally for a seat, a table, and a bed, some clothes, which are put up in leather bags hung up in their tents, a mantle of black woollen, and a few glass or silver rings which the women wear upon their legs and arms. But the principal and most important article in the possession of a Bedoween is his mare, which serves in making his excursions against hostile tribes, or seeking plunder in the country or on the highways. The mare is preferred to the horse, because, as Volney, Chenier, and others say, she does not neigh, is more docile, and yields milk, which occasionally satisfies the thirst, and even the hunger of her master.

The Bedoweens of the desert preserve their butter in a leathern bag; and their water in goat skins. Their hearth consists of a hole made in the ground, and laid with stones; instead of an oven they use an iron plate in preparing their bread, which is made into small cakes. In their excursions, they carry with them a supply of meal, and their other provisions are dates, milk, cheese, and honey. They are dressed much like their brethren in Egypt, except that they wear shoes of undressed leather, and of a peculiar shape; and that many of them walk bare-footed over the scorching sand, which renders their skin at length insensible. Their women appear less shy and scrupulous than the other females of the east, converse more freely with strangers, and expose themselves with their faces unveiled.

The arts of the Arabs, whose wants are few, consist in weaving their clumsy tents, and in making mats and butter. Their whole commerce only extends to the exchanging of camels, kids, stallions, and milk, for arms, clothing, a little rice or cotton, and money, which they bury. They are totally ignorant of all science, and have not even any idea of astronomy, geometry, or medicine. They have not a single book; and nothing is so uncommon among the scheiks as to know how to read. Their whole literature consists in reciting tales and histories, in the manner of the Arabian Nights Entertainments. For such stories they have a peculiar passion; and in the evening they seat themselves on the ground, at the door of their tents, or under cover, if it be cold, and there, ranged in a circle, round a small fire of dung, with their pipes in their mouths and their legs crossed, after indulging for some time in silent meditation, they amuse themselves with the recital of tales of this kind. They have likewise, besides their love-stories, their love-songs, which have in them more nature and sentiment than those of the Turks and the inhabitants of the towns.

It has been observed, that the Bedoweens, though their condition in the depths of the desert resembles, in many respects, that of the savages of America, have not the same ferocity. So that, accustomed to endure hunger, they have never been addicted to the practice of eating human flesh; and their manners are in general much more sociable and mild. Volney attributes this difference of manners to the difference of their situation. The American savages have been induced by the nature of their country to become hunters rather than shepherds; and their habits have contributed to produce and cherish a ferocity of character. But the Bedoweens, whose naked plains, without water or forests, are destitute of fish or game, and possessing the camel, have been determined to a pastoral life, and hence they have acquired manners which have influenced their whole character. Finding at hand a light, but constant and sufficient nourishment, they have acquired the habit of frugality. Content with the milk of the camel and dates, they have not desired flesh; they have shed no blood; their hands are not accustomed to slaughter; nor their ears to the cries of suffering creatures, and they have preserved a sensible and humane heart. Nevertheless, when the Arab shepherd became acquainted with the use of the horse, his mode of life was considerably changed. The facility of passing over extensive tracts of country rendered him a wanderer. He became greedy from want, and a robber from greediness: and such is his present character. A plunderer rather than a warrior, the Arab possesses no sanguinary courage; he attacks only to despoil; and if he meets with resistance, never thinks a small booty is to be put in competition with his life. To irritate him, you must shed his blood; and then he is found to be as obstinate in his vengeance as he was cautious in avoiding danger. The spirit of rapine, with which the Arabs have been often reproached, is exercised only towards reputed enemies, and is accordingly founded on the acknowledged laws of almost all nations. Among themselves they are remarkable for a good faith, a disinterestedness, and a generosity, which would do honour to the most civilized people. What can be more noble than the right of asylum so respected among all the tribes? A stranger, nay even an enemy, touches the tent of the Bedoween, and from that instant his person becomes inviolable. It would be reckoned a disgraceful meanness, an indelible shame,

to ſatisfy even a juſt vengeance at the expence of hoſpitality. Has the Bedoween conſented to eat bread and ſalt with his gueſt, nothing can induce him to betray him. The power of the ſultan himſelf would not be able to force a refugee from the protection of a tribe but by its total extermination. The Bedoween, ſo rapacious without his camp, has no ſooner ſet his foot within it, than he becomes liberal and generous. What little he poſſeſſes he is even ready to divide; and when he takes his repaſt, he takes his ſeat at the door of his tent, in order to invite paſſengers; and this act of generous hoſpitality he regards as a matter of duty; and of courſe he himſelf takes the ſame liberty with others. So far does this reciprocal generoſity prevail, that one would imagine that Arabs poſſeſſed all their goods in common. Nevertheleſs, they are no ſtrangers to property; but without that ſelfiſhneſs which the increaſe of the imaginary wants of luxury has given it among poliſhed nations. Among the Arabs there exiſt a kind of equality in the partition of property, and a variety of conditions, which have appeared, ſays Volney, to the wiſeſt legiſlators as the perfection of human policy. From this ſtate of things, it becomes difficult for their ſcheiks to form a faction for enſlaving and impoveriſhing the body of the nation. Each individual, capable of ſupplying all his wants, is better able to preſerve his character and independence; and private property becomes at once the foundation and bulwark of public liberty. This liberty extends even to matters of religion. Whilſt the Arabs of the towns crouch under the double yoke of political and religious deſpotiſm, thoſe of the deſert, or the Bedoweens, live in a ſtate of perfect freedom from both. On the frontiers of the Turks, indeed, the Bedoweens from policy preſerve the appearance of Mahometaniſm; but ſo relaxed is their obſervance of its ceremonies, and ſo little fervour has their devotion, that they are generally conſidered as infidels, who have neither law nor prophets. They ſcruple not to ſay, that the religion of Mahomet was not made for them; for, they add, "how ſhall we make ablutions, who have no water? How can we beſtow alms, who are not rich? Why ſhould we faſt in the Ramadan, ſince the whole year with us is one continued faſt? And what neceſſity is there for us to make the pilgrimage to Mecca, if God be preſent every where?" In ſhort, every man acts and thinks as he pleaſes; and the moſt perfect toleration is eſtabliſhed among them. Volney obſerves, that there are few poliſhed nations, whoſe morality is, in general, ſo much to be eſteemed as that of the Bedoween Arabs. If this be the fact, we may reaſonably aſcribe it to a variety of circumſtances altogether independent of that ſingularity which he mentions in connection with it, and which ſerve to counteract its effects. Among theſe Bedoweens, as well as the Turkmans and Curds, religion is the freeſt from exterior forms, inſomuch that no man has ever ſeen among theſe claſſes of people either prieſts, temples, or regular worſhip. We can ſcarcely imagine, that even Mr. Volney himſelf, though we are not unapprized of his mode of thinking on the ſubject of religion, would preſume to aſcribe the excellence of the morality of theſe tribes to their total want or diſuſe of all the outward means of producing and maintaining it; but he would probably ſuggeſt the inefficacy, in a moral view, of thoſe forms and modes of worſhip which are eſtabliſhed and practiſed among the Mahometans. The manners of theſe people are preſerved pure and ſimple, and ſuch as are deſcribed in their ancient hiſtories, as Sonnini obſerves, by the abſence of luxury and factitious pleaſures, bringing immorality in their train, which have made no attempt to fix their abode on the parched and barren lands occupied by the Bedoweens.

The Bedoweens, who live in tents in the deſert, have never been ſubdued by any conqueror; but thoſe who have ſettled near towns, and fertile provinces, are reduced, in ſome meaſure, to a ſtate of dependence on the ſovereigns of thoſe provinces. Such are the Arabs, in the different parts of the Ottoman empire; ſome of whom pay a rent or tribute for the towns or paſturages which they occupy; and others frequent the banks of the Euphrates only in one ſeaſon of the year, and in winter return to the deſert. Theſe laſt acknowledge no dependence on the Porte, neither are, properly ſpeaking, ſubject to the Turks; but the police of the latter occaſions frequent, but neither long nor bloody, wars among the Bedoweens. Whenever the Turks interfere in their quarrels, all the tribes combine to repulſe the common enemy of the whole nation. Every grand ſcheik conſiders himſelf as abſolute lord of his whole territory, and accordingly exacts the ſame duties upon goods carried through his dominions as are levied by other princes. The Europeans, therefore, are wrong in ſuppoſing the ſums paid by travellers to the grand ſcheiks to be merely a ranſom to redeem them from pillage. The Turks, who ſend caravans through the deſert to Mecca, have ſubmitted to the payment of theſe duties, paying a certain ſum annually to the tribes who live near the road to Mecca; and theſe in return keep the wells open, permit the paſſage of merchandiſe, and eſcort the caravans. If the Bedoweens ſometimes pillage theſe caravans, the haughty perfidious conduct of the Turkiſh officers is always the firſt cauſe of ſuch hoſtilities. The tribes of Bedoweens on the confines of the deſert, are thoſe who have preſerved the national character in its greateſt purity, and who have maintained their liberty unimpaired. Of theſe, that denominated "Beni Khaled" is one of the moſt powerful, on account of its conqueſts and wealth, and the number of other tribes ſubject to it. It has advanced from the deſert of Nedsjed to the ſea, and conquered the country of Lachſa. That of the tribe of "Kiab" inhabits north from the Perſian gulf, and rarely encamps. Theſe have poſſeſſions in the province of Chuſiſtan in Perſia, in which province there are five different conſiderable tribes of independent Bedoweens. Thoſe of the tribe "Beni Lam," inhabiting between Korne and Bagdad, upon the banks of the Tigris, receive duties upon goods carried from Baſſora to Bagdad, and ſometimes pillage caravans. "The Montefidſi," or "Montefik," are the moſt powerful tribe north from the deſert, with reſpect to extent of territory and number of ſubaltern tribes, acknowledging their authority. They poſſeſs all the country on both ſides of the Euphrates, from Korne to Ardje. The Arabs of this tribe often plunder travellers paſſing between Helle and Baſſora, and are frequently chaſtiſed by the pacha of Bagdad, who depoſes their ſcheik, and ſubſtitutes another in his room. This tribe derives its appellation from one Monteſik, who came from Hedjaz, and was deſcended from a family, illuſtrious before the days of Mahomet. All theſe tribes, that live on the confines of the deſert, are genuine Arabs, who breed ſheep and camels, and live in tents. This, however, is the caſe with reſpect to the reigning tribes; though ſome of the ſubaltern ones have loſt their nobility, by intermixing the practice of agriculture with the habits of paſtoral life.

The rich plains of Meſopotamia and Aſſyria, which were once cultivated by a populous nation, and watered by ſurpriſing efforts of human induſtry, are now inhabited, or rather ravaged, by wandering Arabs. The lands between the Tigris and the Euphrates are occupied by tribes practiſing agriculture, or "Moædan." All travellers complain of the robberies of the Bedoweens of Aſſyria. The reſtleſs and thieviſh diſpoſition of theſe people ſeems to increaſe the farther they recede from their native deſerts, and to approach

[illegible] the country inhabited by the plundering Curds and Turkmans. The pachas of Syria are as much interested in guarding against the depredations of the wandering Arabs, as the Turkish governors on the Persian frontier. As it is of great consequence to the cities of Aleppo and Damascus (which see) that their caravans travelling to Bagdad or Bassora should be suffered to pass in safety through the desert, the pachas, in order to protect them from insult and pillage, artfully venture to employ one tribe of Arabs against the rest; and with this view they give the title of Emir to the most powerful scheik in the neighbourhood. To him they pay an annual sum, or the produce of a certain number of villages, for guiding the caravans, for keeping the other Arabs in awe, and for levying the dues from those who feed their cattle on the pacha's grounds. The most powerful tribe near Aleppo, is denominated "Mauali," besides which, there are many other tribes, amounting to twenty, or more, who pay a trifling sum to the Emir for liberty to hire out or sell their camels, and to feed their cattle through the country. Other tribes pay a tax for the privilege of gathering salt in the "Desert of Salt." In the vicinity of Damascus there are numerous tribes, one of which, named "Abu Salibe," it is said, consists solely of Christians. The greatest tribe in the desert of Syria is that called "Anæse," which is spread into Nedsjed, and reckoned the most numerous tribe in the heart of Arabia. The caravans of Turkish pilgrims pay the Bedoweens of this tribe a considerable duty for their free passage through the country; when dissatisfied, they plunder the caravans, and they often make war on the pacha of Damascus. The Bedoweens, who occupy those countries that are usually comprehended under the appellation of "Arabia Petræa," or the deserts that lie between Egypt, Syria, and Arabia, properly so called, are distributed into several tribes which wander among dry sands and rocks, seeking some few interspersed spots, that afford scanty food for their cattle. The Arabs of Palestine seem to be poor neglected hordes, who inhabit that barren and dismal country; and the pilgrims that visit the Holy Land have given exaggerated relations of the molestations and injury which they have suffered from them.

Of the Bedoweens, there are several tribes, who arrive every year in Egypt after the inundation, from the heart of Africa, to profit by the fertility of the country, and who in the spring retire into the depths of the desert. Others of these are stationary in Egypt, where they farm lands, which they sow, and annually change. All of them observe among themselves stated limits, which they never pass, on pain of war. They all lead nearly the same kind of life, and have the same manners and customs. Ignorant and poor, they preserve an original character distinct from surrounding nations. Pacific in their camp, they are everywhere also in an habitual state of war. Some of these, dispersed in families, inhabit the rocks, caverns, ruins, and sequestered places where there is water; others, united in tribes, encamp under low and smoaky tents, and pass their lives in perpetual journeyings, sometimes in the desert, sometimes on the banks of rivers; having no other attachment to the soil, than what arises from their own safety, or the subsistence of their flocks. The husbandmen, whom they pillage, hate them; the travellers whom they despoil, speak ill of them; and the Turks, who dread them, endeavour to divide and corrupt them. It is calculated that the different tribes of them in Egypt might form a body of 30,000 horsemen; but these are so dispersed and disunited, that they are only considered as robbers and vagabonds. The young women among the Bedoweens of Egypt might be reckoned not destitute of beauty, says Sonnini; though they have a tawny hue, and indelible compartments, not easily reconcilable to the eyes of an European, which they painfully mark on the lower part of the face with a needle, and a black dye. The men are, in general, very handsome. A simple and uniform mode of life, uninjured by excess, prolongs their existence to the period fixed by nature. They live to be very old, and at an advanced age, they are remarkable for their truly venerable and patriarchal physiognomy. Those, however, who are wandering, predatory, and wretched, are for the most part of a slender make and mean appearance. Some of the Egyptian Bedoweens have among them a tradition, that their ancestors were Europeans and Christians, one of whose ships having been wrecked on the coast of Egypt, the crew had been plundered, and reduced to the necessity of living in the desert. The only remnant they have of the supposed Christianity of their forefathers is the sign of the cross, which they traced with their fingers upon the sand. In the plans that have been adopted in Egypt, under Ali Bey, for preventing robbery and establishing public tranquillity, the extermination of the Bedoweens has been a principal object. Several hordes fell victims to the policy of the governor; and whole tribes retired into the desert. However, the people of Egypt, far from approving those means of protecting their property, murmured aloud at the scarcity of camels, sheep, and other animals, with which the Bedoweens had been accustomed to supply them in great abundance, though it was their practice to steal the property which they had sold. It has since appeared, that the prosperity of Egypt is intimately connected with the preservation of the Bedoweens.

To the above accounts of the Bedoweens, extracted from modern travellers, we shall subjoin the description given of their ancestors above 1800 years ago by Diodorus Siculus, l. xix.

"The wandering Arabs dwell in the open country, without any roof. They themselves call their country a solitude. They do not chuse for their abode places abounding in rivers and fountains, lest that allurement alone should draw enemies into their neighbourhood. Their law or their custom forbids them to sow corn, to plant fruit-trees, to make use of wine, or to inhabit houses. He who should violate these usages would be punished infallibly with death, because they are persuaded, that whoever is capable of subjecting himself to such conveniences, would soon submit to masters in order to preserve them. Some lead their camels to graze, some their sheep. The latter are the wealthiest; for, besides the advantages they derive from their flocks, they go to sell in the sea-ports frankincense, myrrh, and other precious aromatics, which they have received in exchange from the inhabitants of Arabia Felix. Extremely jealous of their liberty, at the news of the approach of an army, they take refuge in the depth of the deserts, the extent of which serves them as a rampart. The enemy, in fact, perceiving no water, could not dare to traverse them, whilst the Arabs, being furnished with it by means of vessels concealed in the earth, with which they are acquainted, are in no danger of this want. The whole soil being composed of clayey and soft earth, they find means to dig deep and vast cisterns, of a square form, each side of which is the length of an acre. Having filled them with rain-water, they close up the entrance, which they make uniform with the neighbouring ground, leaving some imperceptible token, known only to themselves. They accustom their flocks to drink only once in three days, so that when they are obliged to fly across these parched sands, they may be habituated to support thirst. As for them-

themſelves, they live on fleſh and milk, and common and ordinary fruits. They have in their fields the tree which bears pepper; and a great deal of wild honey, which they drink with water. There are other Arabs who cultivate the earth. They are tributary, like the Syrians, and reſemble them in other reſpects, except that they do not dwell in houſes. Such are pretty nearly the manners of this people." Volney's Travels in Egypt and Syria, vol. i. Niebuhr's Travels through Arabia, &c. vol. ii. p. 158—183. Sonnini's Travels in Upper and Lower Egypt, p. 303. 317—322. 399. Savary's Letters in Egypt, vol. ii. p. 274, &c. See Arabia.

BEDR, or Bedder Houneine, in *Geography*, a place of Arabia, 20 miles from Medina, and 40 from Mecca, lying in the high road of the caravan of Egypt. The fertile vale of Bedr is rendered famous by the battle fought between Mahomet and the Koreiſh of Mecca, in the ſecond year of the Hegira, A. D. 623. In this vale Mahomet was informed by his ſcouts of the caravan that approached on one ſide, and of the Koreiſh, conſiſting of 100 horſe, and 850 foot, who advanced on the other. After a ſhort debate, the holy prophet ſacrificed the proſpect of wealth to the purſuit of glory and revenge; and a ſlight intrenchment was formed to cover his troops, and a ſtream of freſh water that glided through the valley. "O God," he exclaimed, as the Koreiſh deſcended from the hills, "O God, if theſe are deſtroyed, by whom wilt thou be worſhipped on the earth? Courage, my children, cloſe your ranks; diſcharge your arrows, and the day is your own." At theſe words he placed himſelf, with Abubeker, on a throne or pulpit, and inſtantly demanded the ſuccour of Gabriel and 3000 angels. His eye was fixed on the field of battle: the Muſſulmans fainted and were preſſed: in that deciſive moment the prophet ſtarted from his throne, mounted his horſe, and caſt a handful of ſand into the air: "Let their faces be covered with confuſion." Both armies heard the thunder of his voice; their fancy beheld the angelic warriors; the Koreiſh trembled and fled; ſeventy of the braveſt were ſlain; and ſeventy captives adorned the firſt victory of the faithful. The dead bodies of the Koreiſh were deſpoiled and inſulted; two of the moſt obnoxious priſoners were puniſhed with death; and the ranſom of the others, 4000 drams of ſilver, compenſated in ſome degree the eſcape of the caravan. Herbelot. Bib. Orient. p. 180. Gibbon's Hiſt. vol. ix. p. 300.

BEDRIACUM, in *Ancient Geography*, a village of Italy, ſituate, according to Tacitus, between Verona and Cremona, or about 16 miles from the confluence of the Adda and Po. Cluvier places it between Cremona and Mantua, and ſuppoſes it to have been the preſent Caneto, a large village on the left of the Oglio. M. d'Anville thinks that it was the place now called Cividale on the right ſide of that river. It is famous for two battles fought within a month by Romans againſt Romans, A. D. 69; in the firſt of which the emperor Galba was defeated by Otho, and in the ſecond Otho was defeated by Vitellius.

BEDRIEGER, Groote Bedrieger, in *Ichthyology*, a name given by ſome to the *ſparus inſidiator* of Pallas and Gmelin. Vide *Ruyſch, theatr. &c.*

BEDRIP, or Bedrepe, or Bederape, the cuſtomary ſervice which inferior tenants anciently paid their lord, by cutting down his corn, or doing other work in the field. The word is formed from the Saxon *biddon, to pray*, and *repe, to reap*, or *cut corn*.

BEDROLA, in *Geography*, a town of Spain, in Arragon; 8 leagues from Sangueſa.

BEDSTRAW, in *Botany*. See Galium.

BEDUSTA, in *Ancient Geography*, the ancient Hindoo name of the river Hydaſpes, or the modern Behut.

BEDWIN, Great, in *Geography*, is an ancient borough town ſituated on the eaſtern ſide of the county of Wilts, in England; at the diſtance of 70 miles weſt of London, and 17 miles north from Saliſbury. It is an ancient borough by preſcription, and ſent members to all the parliaments of Edward the firſt. During ſome parts of the ſubſequent reigns, it intermitted ſending; but from the 9th of Henry V., two members have conſtantly repreſented the borough. Theſe are elected by about eighty perſons who poſſeſs freeholds, or inhabit ancient burgage-houſes. The town is governed by a port-reve, aſſiſted by a bailiff, and ſome inferior officers, all of whom are choſen by the former. Bedwin had formerly a market on Tueſday, but this has been diſcontinued for ſome years, in conſequence of its proximity to the larger market town of Marlborough.

Dr. Stukely and ſome other antiquaries have given to this place the honours of a Roman ſtation, and a Saxon city; but there is little proof or probability, that it was ever the former. There are ſome entrenchments remaining on a hill ſouth of the town, where it is ſaid Ciſſa erected a caſtle, and where he ſeated himſelf as viceroy of Wiltſhire and Berkſhire. Towards the end of the ſeventh century, a ſevere and deſtructive battle was fought near this town, between Wulfhere, king of Mercia, and Æſcuin, a powerful Saxon nobleman, when, as Mr. Turner in his Anglo-Saxon Hiſtory, characteriſtically obſerves, "mutual deſtruction was more conſpicuous, than the deciſion of the battle."

The church of Bedwin is a large ancient ſtructure, built moſtly with flints, and ſhaped in the form of a croſs. Among the monuments it contains, is one to ſir John Seymour, who was father of the protector, and of the unfortunate lady Jane Seymour. According to the tradition of the neighbourhood, this lady was married to the tyrannic monarch at a place called Wolf-hall, near Bedwin, where ſir John Seymour then reſided.

Here are two annual fairs. The pariſh contains 316 houſes, and 1632 inhabitants, moſt of whom are employed in agriculture. The famous Oxonian phyſician, Dr. Thomas Willis, was born here.

About two miles weſt of the town is Tottenham park, a ſeat of the earl of Ayleſbury. The houſe was built by the celebrated earl of Burlington, on the ſite of an ancient palace belonging to the marquis of Hertford, who was afterwards created duke of Somerſet. Tottenham-park is part of the foreſt of Savernake, which is the only private foreſt in England independently belonging to a ſubject. It is a large tract of wild ground, profuſely wooded, and containing much fine old oak timber.

BEE, Apis, in *Natural Hiſtory*, a genus of the *Hymenopterous* order, in the Linnæan claſſification of inſects; in *Phyſiology*, and in *Huſbandry*, more commonly expreſſive of the common honey-bee (*apis mellifica*), although likewiſe applicable to the various other ſpecies of honey-bees; and in a ſtill more general ſenſe to thoſe which do not, as well as thoſe which do, produce honey; thoſe which live in ſocieties, as well as thoſe which lead a life of ſolitude, or independence from their kindred kinds; all which have a certain appearance and caſt of character, which, in the common acceptation of the word, claim the diſtinctive epithet of *bee*, or *honey-bee, humble bee, wild bee, &c.*

The bee, or apis tribe, characteriſed in the Linnæan ſyſtem as having, in common with other hymenopterous inſects, four membranaceous wings, and the female being armed

armed with a ſting. This genus comprehends an amazing number of diſtinct ſpecies, many of which are clearly aſcertained; ſome are doubtful; and many, if we may be allowed to reaſon by analogy, are moſt likely yet unknown. Upon the whole, there are ſcarcely any genera of inſects that comprehend a greater number or variety of ſpecies than the *apes*. The majority of thoſe correctly known have been already enumerated under the article APIS, to which the reader is requeſted to refer. The principal ſubdiviſions, or natural families of the genus under which they have been deſcribed by Linnæus, and by various writers before and ſince the time of that naturaliſt, will be alſo found there. Deſcending from the minutiæ of critical inquiry into the complicated characters of thoſe ſubdiviſions, it reſts with us in this place to ſpeak of the *apes* in another point of view:—as a race of animals highly entertaining, for their manners, habits, and inſtinctive properties, to the naturaliſt; important to the œconomiſt in rural life; and familiar to every one by the trivial appellation of "a bee."

Under this head, the common honey, or domeſticated bee, demands the firſt conſideration, as it will ſerve to elucidate the peculiarities of the whole tribe, at leaſt ſo far as they are of material conſequence in the concerns of human life. By the indiſcriminate term of the common honey-bee, we comprehend what are individually named the *queen bee*, or female; *male bee*, or drone; and *working bee*, or neuter. The natural hiſtory of the common bee has been more fully and impartially conſidered than that of any other creature of the inſect tribe; with the exception of the ſilk-worm, and the coccus employed in dyeing, there appears to be none more deſerving of the regard paid to it. As an object of advantage, the honey-bee has been deemed, by the common conſent of mankind in all ages, of ſufficient conſequence to be particularly attended to. We are not to forget the occaſional recurrence of claſſic writers of antiquity to the bee: the paſtoral poets celebrate its praiſe; nor was the cultivation of this uſeful creature overlooked even by the earlieſt Britons, of whom we poſſeſs any record. Its preſervation and its culture were recognized in their laws; the bee itſelf was conſidered as a moſt ſerviceable domeſtic, and the honey one of the greateſt delicacies the bounty of heaven had granted them. In modern days, the importance of the bee has ſuffered a very ſenſible diminution in this country: ſtill it is cultivated, and with advantage, by the thrifty agriculturiſt. But in the warmer regions of Europe, ſuch as the ſouth of France, Italy, and the neighbouring parts of Aſia, its cultivation is attended with more ſucceſs than with us; the climate of thoſe countries, mild, invigorating, and abundantly productive of luxuriant vegetation, is perfectly congenial with the nature of the bee; there it requires but little care from the hand of culture, and amply repays that little beſtowed with the ſpontaneous produce of its induſtry.

Whilſt we are ſpeaking on this particular topic, it will not be thought ſuperfluous to advert to a few remarks that have lately fallen from the pen of M. Latreille, an ingenious French naturaliſt, in an introductory diſcourſe to the ſtudy of bees publiſhed laſt year in Paris. "Dans la grande ſérie des animaux appélés insectes (ſays that writer), il n'en eſt pas dont l'hiſtoire préſente une auſſi grande richeſſe de faits, et une auſſi prodigieuſe fécondité de merveilles, que celle des abeilles. Sous les rapports de l'induſtrie, ces insectes ſont le chef d'œuvre de la toute-puiſſance du Créateur; et l'homme lui-même, ſi fier de ſes dons naturels, eſt, en quelque ſorte, humilié à la vue de l'intérieur d'une ruche. Ceſſons de nous extaſier ſur la cabane ſingulière du caſtor, ſur la conſtruction ingénieuſe du nid de quelques oiſeaux; tout cela eſt oublié, lorſqu'on voit les travaux de l'abeille. Quoi! un animal, qui échappe preſque à la vue, dont l'organiſation, comparée avec celle des êtres des claſſes ſupérieures, eſt ſi imparfaite, ſe réunit en ſociété pour fonder une ville, s'y gouverner par des loix invariables, y vivre dans une harmonie que ni une population exceſſive, ni la diverſité d'humeurs et des caractères des individus qui la compoſent, ne ſauroient altérer! Quoi! une insecte ſi vil en apparence, travaillera ſans relâche pour raſſembler atomes par atomes, les matériaux de ſon habitation, les pétrira, les façonnera avec tant d'art, élévera ces ſuperbes edifices, dont l'architecture a été le ſujet des méditations des plus grandes géomètres, recoltera avec tant de peine cette liqueur ſi agréable, cette eſpèce de nectar connu ſous le nom de miel; et votre ame ne ſeroit pas ravie d'étonnement! vous ne ſeriez pas en contemplation! L'abeille n'a pas ſeulement des droits à votre admiration, elle en a auſſi ſur votre cœur. Si elle travaille avec tant de zèle, c'eſt moins pour la converſation de ſa frêle exiſtence, que pour celle de ſes ſemblables, pour la proſpérité de l'etat." In purſuing this lofty ſtrain of comment, we are leſs inclined to admit the accuracy of his reaſoning, than the energy of diction with which it is advanced. The philoſophy of his arguments is loſt in emphaſis; and that which requires coolneſs to diſarm us of prejudices, is placed in a moſt flattering and glowing light, more likely to miſlead than to inform. We may reply to nearly all that he has ſaid in this reſpect, in the preciſe words of the late Mr. John Hunter, who, after a patient inveſtigation of the bee, its operations, and mode of life, has given his opinion, in the Philoſophical Tranſactions, upon this point to the following effect.—"From theſe animals forming colonies, and from a vaſt variety of effects being produced, and with a degree of attention and nicety that ſeem even to vie with man; man, not being in the leaſt jealous, has wiſhed to beſtow on them more than they poſſeſs, *viz.* a reaſoning faculty; while every action is only inſtinctive, and what they cannot avoid or alter, except from neceſſity, not from fancy. They have been ſuppoſed to be legiſlators, even mathematicians: indeed, on a ſuperficial view, there is ſome ſhew of reaſon for ſuch ſuppoſitions; but people have gone much farther, and have filled up from their own imagination every blank, but in ſo unnatural a way, that one reads it as if it were the deſcription of a monſter." The prevailing ſentiments of this latter writer preciſely correſponding with thoſe of a well-known moralizing poet, may be ſtill more elegantly enforced;—

* * * * * * * The realm of bees
* * * * * * * * * * * * *
* * theſe, for ever, though a monarch reign,
Their ſeparate cells and properties maintain.
Mark what unvaried laws preſerve each ſtate;
Laws wiſe as nature, and as fix'd as fate."

POPE.

To a certain extent this opinion is inadmiſſible. The unerring laws by which the bees are governed, imply rather the inſtinctive compliance of the creature with the appointed ordinance of the Creator, than the reſult of any reaſoning faculty. We are "to look through nature, up to nature's God." We admire, we are wrapt in aſtoniſhment at the wonderful order preſerved amidſt ſuch a vaſt ſociety of contemptible animals: their ſkill is worthy of our contemplation, their induſtry of our imitation; but when we hear of the prudence, the ſagacity, or wiſdom of a bee, compared, nay analyſed, by the ſame criterion as the ſtupendous powers of intellect in man, the wild conjectures of the enthuſiaſtic obſerver ſink into contempt beneath the calm reflection of the mind, and beneath the pen of criticiſm. Much as we are amuſed with the perfection of its works, with the prevailing order, the policy, and aſſiduities of the bee, in its ſocial

mode of life, we cannot perceive the benefit likely to refult to the architect, the geometrician, or the ftatefman, by making thefe the fubjects of their contemplation.

Thus far we have proceeded only in a general manner; in defcending to particulars, the fubject before us naturally divides itfelf into a variety of diftinct branches, under every one of which it is neceffary the Bee fhould be confidered. The line of difcrimination is to be firft drawn between thofe which herd in focieties, and are moft conducive to the intereft of mankind: thofe which, living in focieties, are rather injurious than of utility; and thofe which are folitary, and of courfe, like the latter, live in a ftate of wildnefs. Bees of the firft defcription confift only of a few fpecies; the fpecies of wild affociated bees are rather more numerous; but the far greater number are folitary.

While we are fpeaking of thofe included in the firft clafs, our attention again reverts with much propriety to the common bee, between which, and the other forts of honey-bees, the line of parallel is fo intimately connected, that they cannot eafily, and need not neceffarily be regarded feparately. Of the common bee we are to confider the queen bee, male bee, and working bee; their ftructure and anatomy; their economy, generation, prefervation, and varieties; the other analogous fpecies productive of honey; the general habits of thofe bees which live in focieties; and of thofe which are of a folitary difpofition. The *architecture* of Bees, fo far as it relates to the common honey bee, will fall under notice in the article Honey-Comb;—*Colonies* of Bees, under Hive and Hiving;—the *fwarming* of Bees, their Wax and Honey, under their refpective articles.

Bee, *Sexes of.* There are in every hive or colony three forts of bees, which Linnæus calls regina (fœmina), fuci, (mares), and operariæ (fpadones). The firft is the *queen*, or female; the fecond the *drones*, or males; and the laft the *working* bees, or neuters. The queen is larger than the others; fhe is armed with a fting, and has thirteen joints in the antennæ, including the radicle; thofe of the male have one joint more in the antennæ; the eyes in this fex are large, and it is deftitute of a fting: the working bees are armed with a powerful fting, and have fifteen joints in the antennæ. And here it will be proper to obferve, that the circumftance of the antennæ in the female and neuter bee, containing the fame number of articulations, were not obferved till lately. Linnæus tells us the antennæ of the female has ten joints, the male eleven, and the working bee fifteen; the difcovery to the contrary is due to Mr. Kirby, who, to ufe his own language, fays; "In every one of thefe affertions, with due deference to a name fo great be it fpoken, Linnæus is miftaken."

Bees, *Structure and Anatomy of.* There is nothing particularly ftriking in the ftructure of the bee. In their form they vary in different fpecies, and in different fexes, but generally fpeaking they are uniformly bulky animals, having the head large, the eyes oval and confpicuous, the thorax broad and thick, as well as the body, and moft are commonly covered with hair or down; the fexes diftinguifhable by the number of articulations in the antennæ (being one more in thofe of the male than the female), and the mouth furnifhed with ftrong *inftrumenta cibaria.* The jaws and lip of the apis mellifica are membranaceous at the tip, the former bidentated; as in other bees, the jaws open to the right and left, and ferve to carry out of the hives any thing that incommodes them. To thofe which have no fting, the teeth of thefe jaws are of effential fervice in their wars with fuch as poffefs that formidable weapon; and it is believed, but on what foundation is uncertain, that the wounds inflicted by means of thefe teeth inevitably prove mortal to the other, or ftinging bees, when they bite. The tongue in different kinds of bees is very different in fhape. It has been obferved, that in the more induftrious fpecies, this inftrument, when ftretched out, is fhorter than in the others: be this as it may, the tongue of the common honey-bee is long, inflected, and extremely pliant; by means of this, the bee not only procures itfelf neceffary fubfiftence, but it is alfo employed by the animal to collect the honey, which we appropriate to ourfelves. The parts of which the tongue confifts in different bees are not uniformly diftinguifhed by the fame terms in the works of entomological writers. Proboftis is that by which Mr. Kirby, after the example of Linnæus, when defining the Apis genus, calls the tongue, together with all the machinery that belongs to it, inclufive of the fheath or vagina. This is more fully illuftrated in his diffections of the proboftis of the male, the female, and the neuter of the common honey-bee, wherein the ftructure of this inftrument, and the feveral parts of which it confifts, are correctly difcriminated. It may not be altogether irrelevant to our purpofe to follow this agreeable writer, in fome degree, whilft explaining the ftructure of the proboftis or tongue. This part of the bee is faid to confift of feven pieces; Mr. Kirby fpeaks of more, *viz.* the fulcrum, tubus, valvulæ, cardo, lora, palpi exteriores, palpi interiores, laciniæ exteriores, laciniæ interiores, and lingua. The *fulcrum* is that part upon which the tube is feated, and has been noticed both by Swammerdam and Reaumur; the latter of whom calls it le pivot. *Tubus* is that part called by Fabricius the bafe of the tongue, and by Swammerdam and others the fheath of the tongue, including the bafe of that organ; and in a certain meafure anfwering the fame purpofe as the valvulæ. The latter, or *valvulæ*, form the exterior fheath of the tongue. As to the *cardo*, cardines intervene between the valvulæ and the lora, and feem to perform the office of hinges. Reaumur mentions thefe as "filets tendineux par les quels les tiges font attachées a leurs appuis." *Lora* are fo named by Mr. Kirby from their ufe, which feems to be to let out or pull in the proboftis, being thofe parts which Reaumur calls "les leviers;" when the proboftis is extended, the angle on which the fulcrum of the tube fits, is obferved to point towards the breaft, but when retracted, its pofition changes, and it points towards the mouth. *Palpi exteriores* are organs noticed in the rude fketch of the proboftis of the hive bee by Swammerdam, who does not, however, fpeak of them. In this kind they are fmall, and confifting only of a fingle joint, efcaped the obfervation of Reaumur; in fome bees they are large, and contain from one to fix joints. *Palpi interiores* are thofe parts of the proboftis which Reaumur diftinguifhes by the term "barbes;" in the common bee, thefe confift only of two articulations; in other fpecies they are known to contain a greater number. De Geer calls thefe little organs, "les petit barbillons." *Laciniæ exteriores* are to be met with in almoft every family of the apis genus. *Laciniæ interiores* are peculiar to the apis, and embrace and defend the tongue where it enters the tube; thefe are called by Swammerdam the third pair of joints or the proboftis; Reaumur mentions them as "piéces qui embraffent et fortifient la trompe;" Latreille, in his *Nomada* family, names them "foies laterales." *Lingua*, or the true tongue, called fometimes by De Geer "le levre inferieur," or inferior lip, is occafionally mentioned by Fabricius under the term of labium, or lip. Roemer, in a work entitled "Genera Infectorum, &c." lays down the character of apis thus:—"Jaws dentated, with an inflected proboftis, with two bivalve fhells, in which the tongue is included." Latreille, in a work recently publifhed, divides the apis genus into two families, the firft, corresponding

corresponding with the *melitta* of Kirby, has these characters: "Mâchoires et langue très alongées, deux ou trois fois plus longues que la tête, dirigées en avant dans l'inaction, et dont la base resort inférieurement de la cavité ou elles sont logées. Partie saillant de la langue évasée, a trois divisions plus courte que la gâine: celle-ci longue et cylindrique." The two Fabrician genera, *hylæus* and *andrena*, are arranged under this family; the tongue in *hylæus* is thus described, "langue large; divisions du milieu échancrée, dentelée, ciliée." In *andrena*, "langue oblongue; division au milieu en point renfendue." La gâine, or sheath of the tongue, is not invariably cylindrical in this division (*melitta*) of *apes*; it is sometimes conical.

In the family which includes the true *apes* of Kirby, the tongue is thus described by Latreille: "langue très prolongée, etroite, lineaire presque, cylindrique, un peu coriacée, a papilles vers l'extrémité, fléchie à la sortie de la gâine." *Nomada*, *apis*, and *eucera* of Latreille are included under this head. His *nomada* is thus characterised still further: "langue d'une piece avec deux très petites soies latérales." *Apis*, "langue de trois pièces (organes de la nutrition plus petits dans les mâles)." *Eucera*, "langue de cinq pièces." We have deemed it requisite to be thus minute in following the observations of Kirby, Latreille, and others, who have dissected and examined the structure of the proboscis in different bees, with the aid of microscopic glasses, for the purpose of shewing the fallacy of the commonly received opinion, that in all bees the structure of this organ must be the same. For instance, we see that in one family the tongue is very long, more than twice or thrice the length of the head, with the extremity opening into three divisions, the whole of which is contained within a sheath of a cylindrical form; in others this part is conical. Some have a large tongue, with the middle division of it sloping, jagged, and ciliated, and the end truncated; again, others have an oblong tongue, the middle piece of which is cleft or lacerated at the tip. In many, the tongue is very long, straight or linear, almost cylindrical and papillous at the extremity; while the tongue in others consists of a single piece, having two lateral laciniæ of a small size; and sometimes, on the contrary, the tongue is formed of five pieces; in the *hylæus*, *andrena*, and *nomada* families, the tongue is three-cleft, in *apis* five-cleft, and in *eucera* seven-cleft.

In the formation of the proboscis, the purpose for which nature has designed this curious instrument is very apparent. That of the common bee has been examined with attention. First, the sheath or external parts are observed to protect and strengthen the organs of nutrition which they contain; the valves of the sheath are disposed on each side of the tongue in pairs; with the tongue itself, which is pervious, the bee extracts and gathers the nectareous juices from flowers, which are shortly after converted into honey. The two pieces of the exterior sheath are horny or membranaceous; those of the inner sheath are placed higher above the base than the exterior ones. The proboscis is partly membranaceous, and partly of a gristly nature, and has the lower part formed in such a manner that it is capable of considerable distension, by means of which the internal cavity may be prodigiously enlarged, and rendered capacious enough to receive a great quantity of native honey. When the proboscis is shut up, and inactive, it is very much flattened, and broader than it is thick. The lower and membranaceous parts of the trunk at the base have no hairs upon them, but are covered with little transparent protuberances that are placed in regular order, and at equal distances from each other; these are supposed to be glandules, and may have a considerable share in changing or preparing the honey that is swallowed or taken up by the proboscis. Down the middle of the proboscis there is a tube of a much harder nature than the sides which becomes rather tapering towards the apex, where the proboscis is very thick set with small hairs, which may serve to keep it in a proper situation when in use.

The proboscis is not cylindrical, but rather a kind of convex blade, terminating to all appearance in a point; and the sheaths are so contrived as to cover little more than the upper part of it. These exterior sheaths lap over each other on the upper part, so that the outside of the proboscis is protected by a very strong double case; a covering that was unnecessary for the under part, because, when this instrument is in use, the sheaths are opened, but when inactive, it is so folded, that the under part is protected by the body of the bee. Within the exterior sheath, and near the bottom, are two levers, which are fixed to the end of the proboscis, and by the motion of which it is raised or lowered. If a bee is attentively observed when it alights upon a full blown flower, the activity and address with which it employs this apparatus will prove highly entertaining. The tongue is first protruded, then lengthened, then shortened, and continually kept in motion, bending and turning in every possible direction to adapt itself to the form of the flower.

The sting of the Bee is a curious weapon, adapted to the industrious habits of its life, which expose it to a multitude of dangers. It is truly an instrument in every manner calculated for offensive or defensive operations in the annoyance of its enemies. The wound which the bee inflicts with its sting is severe, to its little antagonists it oftentimes proves mortal, because it not only strikes deeply into their bodies, but conveys at the same time a powerful poison into the wound which it occasions. In the queen or female bee, the sting is longer as well as stouter than in the working bee, and is bent a little under the belly. The female and the working bees are those only which are furnished with a sting; for the male, as before observed, has none. The sting in both is put in motion by means of certain muscles attached to its base, and contained within the abdomen, where also the glands for the secretion of the poison is concealed. This internal apparatus for the preparation of the poison has been misconceived: every writer, except the late Mr. Hunter, considers it as a single receptacle; whereas it appears, from the observations of that judicious anatomist, to consist not of one, but of two small ducts, although those two seem to unite into one: these are situated in the region of the abdomen among the air vessels, and when pressed, inject into the passage of the sting the poisonous fluid drop by drop. The sting is apparently thick and solid at the base, and at the extremity remarkably acute; such is its appearance to the common observer: but strictly speaking, this is nothing more than the sheath or case in which the genuine sting is contained; the latter is an apparatus consisting of two extremely slender bearded darts, each of which has five or six recurved teeth or barbs placed near their extremity, or, according to Derham, they amount to eight recurved teeth on each dart. The sheath is of an horny substance, round at the base, and on the sides grooved, ending in a sharp point, and has an opening near the tip, through which the two bearded darts are protruded beyond the sheath, when the bee is in the act of stinging. When the two barbed darts, of which the true sting consists, are united, they easily enter the flesh, and then opening a little, become for a moment most securely fixed by means of the teeth with which they are beset. Some say one of these darts is rather longer than the other, and fixes its beards, or teeth, first; and the other instantly following, they penetrate alternately deeper and deeper, holding themselves firmly in the flesh with their beards,

 till

till the whole ſting is buried in the wound, and the poiſon injected. When once the bee has completely transfixed its ſting into the fleſh, the acrid cauſtic liquor, called the poiſon, is preſſed from the glands in which it is ſecreted, and paſſing down the channels of the darts, diſcharges its malignant contents into the wound, occaſioning an acute pain and ſwelling of the part, the inflammation of which continues not unfrequently for ſeveral days after. Dr. Hunter, being deſirous of aſcertaining the force of this poiſonous fluid, dipped needles into it, with which he pricked the back of his hand; the like experiment he tried on the ſame part with needles that were not dipped into it, and found that the punctures occaſioned by the former grew ſore and inflamed, while the others did not.

But if the wound which the bee inflicts be painful to thoſe who receive it, to the bee it is attended often with more ſerious harm, for it inevitably proves fatal if by any accident the ſting is broken off in the act of inflicting it. When the creature ſtrikes its ſting deep into the fleſh, and the perſon ſtarts, and diſcompoſes the bee before it can diſengage itſelf, the ſting is almoſt certain of being broken off, and left ſticking in the wound. On the contrary, if he has patience to ſtand quiet, the bee will bring the two ſlender darts cloſe together, and withdraw the whole, in which caſe the wound is always leſs painful. A waſp is not ſo liable to leave its ſting in the wound as a bee; the beards of the darts being ſhorter, and the inſect more nimble and vigorous in its operations. When the bee means to ſting, it flies about the object of its anger very quickly, and by the velocity of its motions, ſeems to evade being ſtruck or attacked to advantage, while preparing for the aſſault. The ſound emitted at this time is alſo peculiar, and to thoſe accuſtomed to bees, is perfectly well underſtood. "The danger of being ſtung by bees (it has been ſaid), may be in a great meaſure prevented by a quiet compoſed behaviour. A thouſand bees will fly and buzz about a perſon without hurting him, if he will but ſtand ſtill and forbear diſturbing them, even when near his face; in which caſe he may obſerve them for hours together without danger; but if he moleſts or beats them away, he uſually ſuffers for it." In the "Edinburgh Medical Commentaries" it has been affirmed, that a perſon is in perfect ſafety in the midſt of myriads of bees, if he were to keep his mouth carefully ſhut, and breathe gently through the noſtrils only; the human breath, it would ſeem, being peculiarly offenſive to their delicate organs: and merely with this precaution, it is ſaid, the hives may be turned up, and even part of the comb cut out while the bees are at work.

Reaumur made uſe of no other remedy for the ſting of the bee than to bathe the part affected with cold water, a remedy which in moſt caſes will allay the pain and inflammation only during the time of its application. Oil of olives, or ſweet almonds, applied to it alleviates the pain. Lombard, a late French writer, in his "Manuel neceſſaire au villageois pour ſoigner les abeilles," preſcribes a better remedy. He recommends that the wound be preſſed, to cleanſe it as much as poſſible from the venomous fluid, and then rubbed with alkali, or with a little diluted quick lime, by means of which the properties of the poiſon will be neutralized; the wounded part, after the application of this remedy, muſt be well waſhed with cold water, when both the pain and ſwelling will be found to have received conſiderable relief.

Bees, *Voice of.* The bee is capable of emitting either by the mouth or motion of the wings, a variety of ſounds, expreſſive of its anger, fear, contentment, and other paſſions; a circumſtance hitherto but very ſlightly regarded by thoſe writers who have, in other reſpects, entered moſt minutely into the hiſtory of this animal. Mr. Hunter, in his paper on the honey-bee, inſerted in the Philoſophical Tranſactions, ſays a few words on this ſubject. Bees, he tells us, may be ſaid to have a voice; or at leaſt, that they are able to form ſeveral diſtinct ſounds. They give a ſound when flying, which they can vary according to circumſtances. One accuſtomed to bees can immediately tell when a bee intends to make an attack by the ſound, moſt likely of the wings, but that is not certain; it may iſſue from the mouth. The bees may be ſeen ſtanding at the door of their hive, with the belly rather raiſed, and moving their wings, by which means a noiſe is occaſioned. But they produce a noiſe independent of that made by the wings; for if a bee be ſmeared all over with honey, ſo as to cauſe the wings to adhere together, the bee will be perceived to make a ſhrill and peeviſh ſound while the wings remain motionleſs. To aſcertain this matter with a ſtill greater degree of accuracy, Mr. Hunter held a bee by the leg with a pair of pincers, and very clearly obſerved that the creature made the ſame peeviſh noiſe while the wings were perfectly ſtill. After this, he even cut the wings off, when the poor bee continued to make the ſame noiſe as before. He immerſed the bee in water, but it did not then produce any noiſe, till it was much teized, when the ſame ſound was heard as in the former inſtance: during this experiment, he could obſerve the water, or rather the ſurface of contact of the water with the air, vibrating at the orifice of an air-hole ſituated at the root of the wing. The ſame writer remarks, that the bees, or ſome kinds of them at leaſt, make a noiſe the evening before they ſwarm, which is a kind of ring or ſound reſembling that of a ſmall trumpet; and by comparing it with the notes of the piano-forte, it ſeemed to be the ſame with the lower *A* of the treble.—When the bees return from their daily excurſions in the fields, to their hives at evening, loaded with farina and honey, they are well known to ſing or hum a ſoft melodious tone expreſſive of their contentment. Entomologiſts are well aware that the ſound emitted by the bee is ſuſceptible of certain modulations. Some of theſe proceed undoubtedly from the motion of the wings, and vary in tone as they are moved with greater or leſs velocity, juſt as we obſerve in other inſects furniſhed with tranſparent wings; and in ſome degree throughout the whole of the inſect race, with the exception of thoſe which have very ſmall wings, or are entirely deſtitute of them. From the obſervation of Mr. Hunter on the emiſſion of air from the lateral trachea, or air veſſel in the ſide, it would ſeem, that a certain ſound may be cauſed by means of theſe little organs: the remark of this anatomiſt deſerves more conſideration than he appeared to be himſelf purſuaded of, ſince we know that the ſinging of the *cicadæ*, a noiſy tribe of inſects, proceeds not from the mouth, but from two lateral openings, one on each ſide of the abdomen; the ſound being produced by means of a moſt ſingular internal organization, and tranſmitted through thoſe openings at the pleaſure of the creature. It is not unlikely, that many inſects may be furniſhed with lateral organs for the purpoſe of making a certain noiſe, although not exactly of the ſame ſtructure in the *cicadæ*, and certainly upon a much ſmaller ſcale. That a bee emits a ſound from the mouth, is alſo believed. A gentleman within our knowledge, who has made the manners of bees his particular ſtudy, can with the utmoſt facility declare the ſex of any bee that may chance to paſs near him, by attending only to the motion and ſound emitted by it whilſt in flight.

Bees, *Age of.* Writers are not agreed as to the duration of the term of life in the honey-bee. Among the ancients it

it was thought to extend to nine or ten years. Virgil and Pliny limit it to seven. Some suppose that they are annual; others, that they live many years, but the latter idea is almost exploded at this time. On the other hand, although they may be considered as annual, a few of the females certainly live through the winter, and lay the foundation for a new society in the ensuing summer. In the month of August, Mr. Hunter imagines the queen, or queens, to be impregnated by the males, and as the males do not provide for themselves, they become burdensome to the working bees, and are therefore destroyed as useless, and thrown out of the hives. When the bees set about the business of providing their winter store, every operation ceases, excepting that of collecting honey and bee-bread for the future subsistence of the colony. At this particular crisis, it would seem as if the males were conscious of their approaching danger, for they do not rest as before on the mouth of the hive either when going in or coming out; activity is apparent in all their actions. But this avails them little, nor does it avert, though it may protract, their fate, for a short time: they are commonly attacked by the labouring bees, one, two, or three together, and seeming to be incapable of making any resistance, or anxious to avoid the contest, attempt only to ensure their safety by hastening out of the way of their cruel enemies as speedily as possible. The labourers do not sting the males, Mr. Hunter tells us, but only pinch, torment, and pull them about, as if to wear them out, and hasten, by such violent treatment, the death of these hapless creatures, who would die naturally in the space of a little time after.

Bees, *Economy of.* When we speak in a familiar manner of the economy of bees, such as the secreting of wax, the constructing of honey combs, ranging the fields and gardens to collect farina and nectareous juices for the preparation of wax and honey; attending, nurturing, and feeding the maggots or larvæ, covering in the chrysalises or pupæ, &c. the labouring bee alone is meant, for the females and the males are only implicated in the common concern, so far as relates to the well government of the colony, and generation of the future brood. Among those who have minutely treated on this subject, (the economy of bees,) many have related very wonderful and incredible circumstances; the moral virtues (as it has well been said) have all, at one time or other, been attributed to the bees. They have been celebrated for their prudence, industry, mutual affection, unity, loyalty to their sovereign queen, public spirit, sobriety, and cleanliness. The sagacity of bees in foreseeing rain, or cold has been often mentioned: this is not very questionable: for a short time, at least, before we are sensible of the alteration in the state of the weather, their conduct proves that they are not ignorant of it. Mr. Hunter frequently observed their return home in great numbers before rain or cold was coming on, without being able to perceive himself, till some time after, the change in the temperature of the atmosphere. Bees require a considerable degree of heat; the eggs must be kept warm, and neither the larvæ nor chrysalises, it is asserted, will live in cold of 60° or 70°. "Bees (says one writer) seem to be warned of the appearance of bad weather, by some particular feeling. It sometimes happens, even when they are very assiduous and busy, that they on a sudden cease from their work: not a single one flies out; and those that are abroad hurry home in such prodigious crowds, that the doors of their habitations are too small to admit them. On this occasion, look up to the sky, and you will soon discover some of those black clouds which denote impending rain. Whether they see the clouds gathering for it, as some imagine, or whether (as is much more probable) they feel some other effects of it upon their bodies, is not yet determined; but it is alleged, that no bee is ever caught even in what we call a sudden shower, unless it have been at a very great distance from the hive, or have been injured by some accident, or been sickly, and unable to fly so fast as the rest. Cold is a great enemy to them. To defend themselves against its effects during a hard winter, they crowd together in the middle of the hive, and buzz about, and thereby excite a warmth that is often perceptible by laying the hand upon the glass window of the hive. They seem to understand one another by the motion of their wings: when the queen wants to quit the hive, she gives a little buzz; and all the others immediately follow her example, and retire along with her."

Although many of the accounts that have been given of the bee are fabulous, an intimate acquaintance with them in their domestic operations, has furnished many real facts that are as surprising as those which are apparently, or perhaps wholly, groundless. It is not to be disputed, that at certain times, when they think their stores likely to fall short, they make no scruple to kill and throw out of the hives their own offspring; the larvæ and young bees of the male or drone kind, scarcely extricated from their pupa state, have been carried away and left to perish. They may be just in some respects in their own kingdom, and to those who are to be considered as their fellow subjects, but they rob and plunder strangers whenever they have power and opportunity; and they have frequently battles in committing depredations on neighbouring colonies and hives, or in repelling the aggressions of other invaders, in their own defence, which always terminate fatally to many of their number. This indeed does not often happen, except early in the spring, or late in autumn, when honey is scarce in their hives, and there are no flowers abroad to furnish them with more. In this case, when they have ranged the fields without success, they endeavour to supply themselves at the hazard of their lives, from the stores of other bees. However, in all these conflicts, if the queen of either hive that happens to be engaged is killed, the battle ceases, and both parties unite under the survivor.

The industry and activity of bees in their domestic labours, afford a very instructive and amusing spectacle; all are busily engaged in their several departments. While some are employed in gathering honey and wax, others repair the rotten combs; others carry out the dead, and cleanse the filth; others keep guard, placing themselves in five or six files eight or ten deep upon the floor of the hives, so that all the bees when they enter must pass between them; some are even said to serve for bridges or ladders for others to pass over; and when they are tired with labour, they recruit themselves with rest. For this purpose, they form larger or smaller clusters in the following manner: each bee with its two fore-legs lays hold of the hinder legs of the bee that is next above it, and thus a chain is formed by the successive application of one to another, and the first bee supports the weight of all the rest to the bottom of the chain. The larger clusters are only a multitude of these chains, of which there are sometimes an hundred together. The bees, it is said, never lay hold of any part of one another, except the legs. In this way, they likewise guard themselves from the effects of cold, and continue for several weeks together in a state of torpidity.

Bees, we are told, when they begin to work in their hives, divide themselves into four companies; one of which roves in the fields, in search of farina for the wax; another is employed in laying out the bottoms and partitions of the cells; a third in making the inside smooth from the angles

and corners; and the fourth in collecting and bringing food for the ſupport of the reſt, or in relieving thoſe who return heavily laden. Neither of theſe four companies is kept conſtantly to one employment; they often change the taſks aſſigned them: thoſe that have been at work, for example, in the conſtruction of the cells, are permitted to go abroad, and thoſe which have been in the fields already, are allowed to take their places in the hive. They are believed, and not without reaſon, to have certain ſigns, by means of which they underſtand each other, and one ſtriking inſtance is adduced in proof of this: when any one of the bees is in want of food, the creature bends down its trunk to the bee from whom it is expected, the latter immediately opens its honey-bag, and lets ſome drops of honey fall into the mouth of the other, which is at that time obſerved open to receive it. Many other circumſtances might be likewiſe mentioned, were they neceſſary to confirm this idea. Theſe particulars relate almoſt excluſively to the operations of the neuter or labouring bee: the males anſwering no other purpoſe than ſimply that of males in their ſexual capacity; and the queen or female breeder only attending to the diſcharge of her more important duties, the laying of eggs, and influencing, by her preſence, the working bees, to perſevere in their reſpective labours.

Bees, *Generation of.* Theſe inſects begin to breed in the upper part of the hive, in the cells adjoining to thoſe which are filled with honey, and they deſcend gradually into the lower parts, as the flowers which furniſh them with wax increaſe in plenty. The cells deſigned for the working bees, are commonly half an inch deep; thoſe for the drones, three quarters of an inch; and thoſe intended to contain the honey only, ſtill deeper. The queen bee is generally concealed in the moſt ſecret part of the hive, and is never viſible, except when ſhe happens to lay her eggs in ſuch combs as are expoſed to ſight. When ſhe does appear, ſhe is always attended by ten or a dozen of the common ſort, who form a kind of retinue, to follow and guard her wherever ſhe goes. Before ſhe lays her eggs, ſhe examines the cells where ſhe deſigns to lay them; and if ſhe finds they contain neither honey, wax, nor embryo, ſhe introduces the poſterior part of her body into the cell, and fixes to the bottom of it a ſmall white egg, which is compoſed of a thin membrane, filled with a whitiſh liquor. In this manner ſhe proceeds on, till ſhe fills as many cells as ſhe has eggs to lay, which are generally many thouſands. Sometimes more than one egg has been depoſited in the ſame cell; when this is the caſe, the working bees remove the ſupernumerary eggs, and leave only one in each cell. On the firſt or ſecond day after the eggs are lodged in the cells, the drone bee is ſuppoſed by many to inject a ſmall quantity of whitiſh liquid, which in about the courſe of a day is abſorbed by the egg. On the third or fourth day is produced a maggot, which, when it is grown ſo as to touch the oppoſite angle of the cell, coils itſelf up in the ſhape of a ſemicircle, and floats in a certain liquid whereby it is nouriſhed, and enlarged in its dimenſions: this liquid is of a whitiſh colour, of the thickneſs of cream, and of an inſipid taſte, like flour and water. The origin and qualities of this liquid are not correctly explained: ſome have ſuppoſed that it conſiſts of ſome generative matter injected by the male or drone bee into each cell, in order to give fecundity to the egg: a more probable opinion is, that it is the ſame with what ſeveral writers call the *bee-bread*; and that it is a mixture of water with the juices of plants and flowers, collected merely for the nutrition of the young while they are in a weak and helpleſs ſtate. Whatever may be the nature of this aliment, it is certain the bees are very induſtrious in ſupplying the worms with it. The larva, or maggot, is fed by the working bees for about eight or ten days, till one end touches the other in the form of a ring, and when it begins to find itſelf uneaſy in its firſt poſture, it ceaſes to eat, and begins to unroll itſelf, thruſting the head forwards towards the mouth of the cell. The attendant bees, obſerving theſe ſymptoms of approaching transformation, deſiſt from their labours in carrying food, and employ themſelves in faſtening up the top of the cell with a lid of wax formed in concentric circles, and by their natural heat aſſiſt in cheriſhing the brood, and haſtening the birth. In this ſtate, the larva extends itſelf at full length, and prepares a kind of ſilky covering, which forms a complete lining for the cell, and affords a convenient receptacle for the transformation of the larva to the pupa ſtate. Some naturaliſts ſuppoſe, that as each cell is deſtined to the ſucceſſive breeding of ſeveral larvæ, the whole web, which is compoſed of many cruſts or doubles, is, in reality, a collection of as many webs as there have been larvæ. M. Maraldi apprehends, that this lining is formed of the ſkin of the larva, thrown off at its entrance into the nymph or pupa ſtate; but it is urged by others, that if the cells are opened when recently covered by the bees, the larva within will be found in its own form, and detected in the act of ſpinning its web; and by means of glaſſes, it will be found compoſed of fine threads, regularly woven together, like thoſe of other ſpinning animals.

In the ſpace of eighteen or twenty days, the whole proceſs of transformation is finiſhed, and the bee endeavours to diſcharge itſelf from confinement, by forcing an aperture with its jaws through the covering of the cell; the paſſage is gradually dilated; ſo that one of the maxillæ or jaws appears firſt; then the head, and afterwards the whole body; this is uſually the work of three hours, and ſometimes of half a day. The bee, after it has diſengaged itſelf, ſtands on the ſurface of the comb, till it has acquired its natural complexion, and full maturity and ſtrength, ſo as to become fit for labour. The reſt of the bees gather round it in this ſtate, congratulate its birth, and offer it honey out of their own mouths. The exuviæ, and ſcattered pieces of wax which are left in the cell, are removed by the working bees; and the cavity is no ſooner cleanſed, and fit for new fecundation, but the queen depoſits another egg in it; inſomuch, that M. Maraldi ſays, he has ſeen five bees produced in the ſame cell, in the ſpace of three months. The young bees, it is ſaid, are eaſily diſtinguiſhed from the others by their colour: they are grey inſtead of the yellow brown of the common bees, the reaſon of which is, that their body is black, and the hairs that grow upon it are white; from the mixture of theſe that are ſeen together, reſults a grey; but this colour forms itſelf into browniſh by degrees; the rings of the body becoming more brown, and the hairs yellower.

Reaumur ſuppoſed, before the time of Linnæus, the queen bee to be the only female in the hive, and conſequently, the mother of the next generation: that the drones are the males by which ſhe is fecundated; and that the working bees, or thoſe which collect wax on the flowers that knead it, and form the combs and cells, and afterwards fill them with honey, are the neuters.

Schirach, in his "Hiſtoire Naturelle de la Reine des Abeilles, &c." publiſhed in 1772, has advanced a different opinion upon this ſubject. He ſuppoſes, that all the common, or honey bees, are females in diſguiſe, in which the organs that diſtinguiſh the ſex, and particularly the ovaria, are obliterated, or at leaſt from their extreme minuteneſs, have eſcaped the obſerver's eye; that every one of theſe bees, in the earlier period of exiſtence, is capable of becoming a queen bee, if the whole community ſhould think proper to nurſe it in a particular manner, and raiſe it to that rank;

rank; in ſhort, that the queen bee lays only two kinds of eggs, thoſe which are to produce the drones, and thoſe from which the working bees are to proceed. This author made his experiments not only in the ſpring months, but even as late as November. He cut off from an old hive a piece of the brood comb, taking care that it contained larvæ (or *worms* as they are termed) which had been hatched about three days. This he fixed in an empty hive, together with a piece of honey-comb for food to his bees, and then introduced a number of common bees into the hive. As ſoon as the bees found themſelves deprived of their queen, and liberty, a dreadful uproar took place, which laſted twenty-four hours. On the ceſſation of this tumult, they betook themſelves to work, firſt proceeding to conſtruct a royal cell, and then taking the proper meaſures for feeding and hatching the brood incloſed within them; ſometimes, even on the ſecond day, the foundations of one or more royal cells were to be perceived, which proved a certain indication that they had elected one of the incloſed larvæ to the ſovereignty.

The final reſult of theſe experiments ſeemed to be, that the colony of working bees being thus ſhut up with a piece of brood comb, not only hatch, but at the end of eighteen or twenty days, produce from thence one or two queens, which, it was ſuppoſed, proceeded from the larvæ of the common working bee, and which had been converted by the colony into a queen, merely becauſe they wanted one. —From theſe, and other experiments repeated, Mr. Schirach concluded, that all the common working bees muſt be originally of the female ſex; although, if they are not fed, lodged, and brought up in a particular manner while in the larva ſtate, their organs are not developed; and that it is this circumſtance attending the bringing up of the queen, that allows the full extenſion in the female organs in the firſt inſtance, and produced afterwards that difference in her ſize and aſpect, ſo diſſimilar to that of the working bee.

Mr. Debraw, an ingenious apothecary of Cambridge, made many experimental remarks on bees, which are inſerted in the Philoſophical Tranſactions for 1776. He profeſſes to have detected the impregnation of the eggs by the males, as well as to have diſcovered the difference in ſize among the drones or males, of which Maraldi and Reaumur, beſides ſome others, had conceived there might be two diſtinct kinds. Mr. Debraw ſays, he watched the glaſs hives with indefatigable attention from the moment the bees (among which he took care there ſhould be a large number of drones) were put into them, to the time of the queen's laying her eggs, which generally happens the fourth or fifth day. He obſerved, that on the firſt or ſecond days, (always before the third) from the time the eggs are placed in the cells, a great number of bees faſtening themſelves to one another, hung down in the form of a curtain from the top to the bottom of the hive. They had done the ſame at the time the queen bee depoſited her eggs, an operation which ſeems contrived on purpoſe to conceal what is tranſacting; however, through ſome parts of the veil he was enabled to ſee ſome of the bees inſerting the poſterior part of their bodies, each into a cell, but continuing there only a ſhort time. When they had retired, it was eaſy to diſcover a whitiſh liquor left in the angle of the baſis of each cell which contained an egg. In a day or two this liquor was abſorbed into the embryo, which, on the fourth day, aſſumes its larva ſtate, and is attended by the working bees, who bring it a little honey for nouriſhment, and continue to feed it for the ſpace of eight or ten days after its birth. When the bees find that the larva has attained its full ſize, they deſiſt from bringing any more food, knowing that the larva has no more occaſion for it while in that ſtate; but they have ſtill another ſervice to beſtow upon it, in which they never fail to perform their duty: this is to ſhut up the top of the cell in which the larva is encloſed; for eight days longer it remains within the cell after being thus immured, during which time a further change takes place; the larva, which was before idle, begins to work as ſoon as the bees commence their operation of cloſing up the cell; while the latter are employed in making the covering of wax, the larva is at work within the cell, which it lines with a fine ſilk. The larva thus concealed, voids its excrements, quits its ſkin, and aſſumes the pupa form; at the end of ſome days, the young bee acquires ſufficient ſtrength to quit the covering of the pupa, tear through the waxen encloſure of its cell, and proceed from thence a perfect winged inſect.

To prove ſtill further that the eggs are fecundated by the males, and that their preſence is neceſſary at the time of breeding, Mr. Debraw made the following experiments: he left in the hive the queen, with only the common or working bees, without any drones, to ſee whether the eggs ſhe laid would be prolific: for this purpoſe, he took a ſwarm, and ſhook all the bees into a tub of water, leaving them there till they were quite ſenſeleſs, by which means he was able to diſcover the drones without any fear of being ſtung by the others; he then reſtored the queen and working bees to their former ſtate by ſpreading them on a brown paper in the ſun, after which he placed them in a glaſs hive, and they began very ſoon to work as uſual. The queen laid eggs, which to his great ſurpriſe were impregnated; for he imagined he had ſeparated all the drones, or males, and therefore omitted watching them. At the end of twenty days, he found ſeveral of the eggs had, in the uſual courſe of changes, produced bees, while ſome had withered away and others were covered with honey. Hence he inferred that ſome of the males had eſcaped his notice, and impregnated part of the eggs. To convince himſelf of this, he took away all the brood comb that was in the hive, in order to compel the bees to provide a freſh quantity, being determined to watch narrowly their motions after the new eggs ſhould be laid in the cells. On the ſecond day after the eggs were placed in the cells, he perceived the ſame operation that was mentioned before, namely, that of the bees hanging down in the form of a curtain, while others thruſt their poſterior end of the body into the hive. He broke off a piece of the comb in which were two of theſe inſects, and found in neither of them any ſting; (a circumſtance peculiar to the drones;) upon diſſection, with the aſſiſtance of a microſcope, he diſcovered the four cylindrical bodies which contain the glutinous liquor, of a whitiſh colour, as obſerved by Maraldi in the large drones. He was therefore now under the neceſſity of repeating his experiments, after deſtroying the males, and even thoſe which might be ſuſpected to be ſuch.

He once more immerſed the ſame bees in water, and when they appeared to be in a ſenſeleſs ſtate, he gently preſſed every one, in order to diſtinguiſh thoſe armed with a ſting from thoſe which had none, and which of courſe he ſuppoſed to be males. He replaced the ſame ſwarm in a glaſs hive, where they immediately applied themſelves again to the work of making cells, and on the fourth and fifth day, very early in the morning, he had the pleaſure to ſee the queen bee depoſit her eggs in thoſe cells; he continued watching moſt part of the enſuing days, but could diſcover nothing of what he had ſeen before.

The eggs, after the fourth day, were found in the ſame ſtate as on the firſt day, except that ſome of them were covered with honey. A ſingular event happened next day about

about noon; all the bees left their hive, and were ſeen attempting to get into a neighbouring one, on the ſtool of which the queen bee was found dead, being, no doubt, ſlain in an engagement. This event Mr. Debraw ſuppoſes to have ariſen from the deſire of the bees to perpetuate their ſpecies, to the concurrence of which the males were neceſſary, and that this conſideration alone induced them to deſert their habitation where no males were left, and to fix their reſidence in a new one, where there was a ſtock of them.

To be more fully ſatisfied in this reſpect, Mr. Debraw took the brood comb which had been impregnated, and divided it into two parts; one of which he placed under a bell glaſs with honey-comb, for the food of the bees, taking care to leave a queen, but no drones among the bees confined in it; the other piece of brood-comb, he placed in another bell glaſs with a few drones, a queen, and proportionable number of common bees. The reſult was, that in the piece put into the firſt glaſs there was no impregnation, the eggs remaining in the ſame ſtate as they were when firſt placed in it, and on giving the bees their liberty on the ſeventh day they all flew away; whereas in the other glaſs, which contained the ſecond piece of brood-comb, the very day after the bees had been put into it, the eggs were impregnated by the drones, and the bees did not ſhew the leaſt inclination to abandon their new habitation when the glaſs was left open to allow them to eſcape.

Such are briefly the different opinions of thoſe experienced obſervers of the bee, Reaumur, Maraldi, Schirach, and Debraw, whoſe ſeveral ideas founded, as it muſt appear, upon the moſt laborious, indefatigable, and minute inveſtigation, have met with many advocates. On a ſubject of this intereſt we ought not to aſſume any opinion haſtily, or in an affair ſo myſterious, obtrude our own without a conſiderable degree of caution. Some writers of no mean celebrity have treated, ſince the time of theſe obſervers, upon the ſame topic, whoſe remarks deſerve to be impartially conſidered. To the foregoing obſervations, and ſome others made by Schirach in particular, the late Mr. Hunter has replied, in a paper written by him expreſsly on bees, and inſerted in the Philoſophical Tranſactions for 1792, of which we are to avail ourſelves. The experiments performed by Schirach, Mr. Hunter is diſpoſed to think inaccurate, and the reſult inferred from them of courſe unworthy of credit: how far the arguments of the latter are likely to refute the obſervations of Schirach, remains to be decided, when we have conſidered them in his own words. The criticiſms of this anatomiſt are introduced to notice, in ſpeaking of the queen bee. "The queen bee, as ſhe is termed, (ſays Mr. Hunter) has excited more curioſity than all the others, although much more belongs to the labourers. From the number of theſe, and from their expoſing themſelves, they have their hiſtory much better made out; but as there is only one queen, and ſhe is ſcarcely ever ſeen, it being only the effect of her labour we can come at, an opportunity has been given to the ingenuity of conjecture, and more has been ſaid than can well be proved. She is allowed to be bred in the common way, only there is a peculiar cell for her in her firſt ſtage, and Reaumur ſays, "her food is different when in the maggot ſtate;" but there is probably but one queen, and that the whole might not depend on one life, it is aſſerted that the labourers have a power of forming a common maggot into a queen. If authors had given this as an opinion only, we might have paſſed it over as improbable, but they have endeavoured to prove it by experiments, which require to be examined; and for that purpoſe I ſhall give what they ſay on that head, with my remarks upon it."

Abſtracts from Schirach.—"In twelve wooden boxes were placed twelve pieces of the comb; in each box was ſhut up a handful of working bees. Knowing that when bees are forming a queen, they ſhould be confined, the boxes were kept ſhut for two days. When examined at the end of that period," (ſix boxes only were opened) "in all of them royal cells were begun, one, two, or three in each, all of theſe containing maggots four days old. In four days, the other ſix boxes were opened, and royal cells were found in each containing maggots five days old, ſurrounded by a large proviſion of jelly, and one of theſe maggots, examined in the microſcope, in every reſpect reſembled a working bee."

"This experiment was repeated, and the maggots ſelected to be made queens were three days old; and in ſeventeen days there were found in twelve boxes fifteen lively handſome queens. Theſe experiments were made in May, and the bees were allowed to work great part of the ſummer. The bees were examined one by one, but no drone could be diſcovered, and yet the queens were impregnated, and laid their eggs." [Here is a wonder! queens laying eggs, (which we muſt ſuppoſe Mr. Schirach meant we ſhould believe) and they hatched without the influence of the male.]

"The above experiment was repeated with pieces of comb, containing eggs only, in ſix boxes, but no preparation was made towards producing a queen.

"The experiment of producing a queen bee from a maggot was repeated every month of the year, even in November."

"A maggot of three days old was procured from a friend encloſed in an ordinary cell, and ſhut up with a piece of comb containing eggs and maggots. That, three days old, was formed into a queen, and all the other maggots and eggs were deſtroyed.

"In above a hundred experiments a queen bee has been formed from maggots three days old. [The working bees, as all females, although the ovaria is too ſmall for examination," &c. Vide Phil. Tranſ.]

Mr. Hunter next proceeds to ſpeak of another author who repeated the experiments of Schirach. "Wilhelmi (he ſays) obſerves that a queen cell, which is made while the bees are ſhut up, is formed by breaking down three common cells into one, when the ſides are repaired."—"A young queen was put into a hive which had been previouſly aſcertained to contain no drones, and whoſe queen was removed, and yet the young queen laid eggs." [Probable.] In repeating Mr. Schirach's experiment, he ſhut up four pieces of comb with one maggot in each: after two days the maggots were all dead, and the bees had deſiſted from labour. [There is no myſtery in this: but did they hatch?]—"A piece of comb, from which all the eggs and maggots had been removed, was ſhut up with ſome honey, and a certain number of workers: in a ſhort time they became very buſy, and upon the evening of the ſecond day 300 eggs were found in the cells. [This would ſhew that labourers can be changed into queens at will, and that neither they nor their eggs require to be impregnated; if this was the caſe, there would be no occaſion for all the puſh in making a queen or a male.] He repeated this experiment with the ſame reſult, and the bees were left to themſelves: they placed the queen maggots in the queen cells newly conſtructed, and others in male cells, the reſt was left undiſturbed. He again took two pieces of comb, which contained neither eggs nor maggots, and ſhut them up with a certain number of workers, and carried the box into a ſtove; next evening one of the pieces of comb contained ſeveral eggs, and the beginning of a royal cell was empty."

Beſides theſe ſhort obſervations contained in the brackets, Mr. Hunter tells us he has his doubts reſpecting the whole of

of thefe experiments of Schirach, &c. from feveral circumftances that occurred in the courfe of his experiments. The three following facts appear, in his mind, much againft their probability. Firft, a fummer's evening in England is commonly too cold for fo fmall a parcel of bees to be lively, fo as to fet about new operations; they get fo benumbed that they could hardly recover in the day, and he fufpects, where thefe experiments were made, it alfo was too cold; and indeed fome even are faid to have been tried in this country. Secondly, if the weather fhould be fo warm as to prevent this effect, then they are fo reftlefs that they commonly deftroy themfelves, or weary themfelves out; at leaft, after a few days confinement we find them moftly dead; and, thirdly, the account given of the formation of a royal cell, without mentioning the above inconvenience, which is natural to the experiment, leads him to fufpect the whole to be fabricated. To obviate the firft objection, which he found from experiment would prevent any fuccefs that might otherwife arife, he put parcels of bees with their comb, in which were eggs and maggots, (and in fome trials chryfalifes befides) into a warmer place, fuch as a glafs frame over tan, the furface of which was covered with mould to prevent the ill effects of the unwholefome effluvia arifing from it; but from knowing that the maggot was fed with bee-bread, or farina, he took care to introduce a cell or two with this fubftance, and alfo the flowers of plants that produce a great deal of farina, together with fome honey for the old bees. In this manner his bees were preferved from the cold, and alfo provided with neceffaries; but after being confined for feveral days, upon opening the doors of the hive, thofe which remained alive came to the door-way, walked and flew about, but gradually left it, and on examining the combs, &c. he found the maggots dead, and nothing like an operation going on. He chofe to have fome chryfalifes in the comb, fuppofing that if the bees died or flew away, thofe newly hatched afterwards from thofe chryfalifes, which would happen in a few days, not knowing where to go, might ftay and take care of the maggots that would be hatched from the eggs; but to his furprife he found on opening the box that neither the eggs hatched; nor the chryfalifes came forth, all died; from which he began to fufpect that the prefence of the bees was neceffary for both. "The queen, the mother of all, (he concludes with faying) in whatever manner produced, is a true female, and different from the labourers and the male." He defcribes the difference between the female and the male, obferves that he believes a hive has only one queen; and mentions Riem, who afferts that there are fupernumerary queens, which he has feen killed both by labourers and the males.

With due refpect to the memory of fo great a man, we had expected better reafoning, and a more copious and extenfive inveftigation of this myfterious affair, from the pen of Mr. John Hunter. After following him through his various remarks, we are almoft at a perfect lofs to conceive their tendency. He fets forwards with expreffing his doubts as to the accuracy of Schirach's experiments, who had, it feems, endeavoured to prove, that a queen bee might be reared from the humble condition of the larva of a common worker: the fuggeftion meets his ridicule, a ftrong vein of which is apparent throughout his notes; and in the true fpirit of critical analyfis, he proceeds to examine the experiments by which this fuggeftion has been fupported. Some few inadvertencies of expreffion in the ftatement of particulars, are mentioned by him, and after relating two or three unfatisfactory experiments, made in order to invalidate the obfervations of Schirach, he tells us, that "the queen bee, the mother of all, in whatever manner produced, is a true female," an inference fo logical, that no one would be inclined, we may prefume, to difpute it; but furely it could require no matter of argument, nor criticifm, nor feries of experiments, to prove, that the mother of all muft be a female; nay, ftill lefs was it incumbent upon him to fupport, by the ufe of many words, that this female was produced in fome manner or another; this is apparent enough; we need not be therefore folicitous to enquire whether fhe is produced, but to know in what manner that production is accomplifhed; and here we are left in uncertainty. If Mr. Hunter was convinced that the obfervations of Schirach were erroneous, he could not, we apprehend, be ignorant of the manner in which fhe is produced; or, if he was, he muft have been unauthorifed to cenfure Schirach. In a word, it ought to be acknowledged in candour, between the two parties, that we had expected, in the outfet, Mr. Hunter would have fairly controverted the arguments of his opponent, but in the conclufion perceive, too evidently, that he is content to contradict them only.

But the experiments of Schirach have been found in many refpects confiftent with the difcoveries of later naturalifts; experience has proved that in many points he is correct. It is almoft enough to fay that they are in part confirmed by Huber. The latter writer, after profeffing his opinion, that there are no fuch creatures as mules or neuters in the fociety of bees, endeavours to fhew that the working bees are all originally of the female fex; and that each is confequently provided with an *ovaria*, or womb, which neither Swammerdam, Reaumur, and perhaps no other before him, had ever feen, although they had conjectured it muft be fo. He cites in proof of the pofition that they muft be females, the difcovery of Schirach; who, although he had not detected the ovaries, had feen the larvæ of the working bees converted into queens, when the neceffities of the ftate required it; a fact of which Huber had been occafionally himfelf a witnefs. Huber is perfuaded, that however ftrange it may appear, it depends entirely on the manner in which the larva is treated while remaining in the comb, whether the individual will become a perfect female, fitted for the purpofe of perpetuating the race, the mother of the future fwarm; and of being invefted with the powers of fovereignty; or be doomed to a life of labour as a common working bee. If the larva be intended for the latter condition, the egg is lodged within the confines of a narrow cell; which, when the larva hatched from it attains a certain fize, effectually prevents the diftenfion of thofe organs of the ovaria that are neceffary to the great purpofe of rendering the creature prolific in the laft ftage of being. Thus it happens, that unlefs the larva be allowed fufficient room for thefe organs to expand, they continue to be crippled, compreffed, and afterwards incapable of that expanfion which is abfolutely requifite in impregnation. Hence we perceive the motives for that efpecial care which the working bees beftow on the enlargement of the cells of thofe larvæ which any fortuitous accident may induce them to adopt for the female parent of the future brood. If the larva of a working bee is to be converted into a prolific female, the cell in which it has been lodged is broken into and made more capacious than before; this permits the creature to attain its full and proper fize; the ovaria, no longer ftraightened by the compreffion of its cell, affumes a new and more expanfive form; and when the infect comes forth in the winged ftate, the fexual organs are found to have acquired that degree of maturity which can alone render it capable of fulfilling the ordinary functions for which they were defigned. There is alfo another caufe to which the barrennefs of the working bee is attributed, the quantity of aliment which it receives in the larva form. At this time the creature is pent up within its narrow cell, and is allowed only a certain portion of the

paſte deſtined for food; the queens, on the contrary, are more liberally ſupported; they are cheriſhed with the utmoſt care, and their growth is promoted by every means poſſible. There are ſometimes ſeveral worms, or at any rate two or three reared in every comb for queens; and for the reception of which, if the royal chambers had not been before conſtructed, ſeveral common cells are broken down to effect an enlargement ſuitable for the purpoſe. Theſe larvæ are ſupplied with what is called by ſome the royal jelly, the powerful properties of which are ſometimes obſerved to operate on the larvæ of the common workers; for when it happens that the eggs and worms of ſuch, contained within the cells adjacent to the royal chambers, receive by accident a quantity of this jelly, we are told they produce prolific working bees, although ſuch are very rarely obſerved; but the reaſon of which is obvious; the queen bees are no ſooner hatched than they attack theſe prolific workers without mercy, and deſtroy them. The ſame fate, as is well known, attends all the queen bees, with the exception of the queen bee elect, who muſt ſupport her claim in the firſt inſtance by conquering and deſtroying her rivals, who would aſpire to the ſame honours.

There have been many very ſtrange conceits indulged reſpecting the impregnation of the eggs of bees by the drones, or male bees. Among the ancients, as well as the moderns, it was, and is ſtill believed, that the eggs are fecundated like thoſe of fiſhes by the males diffuſing a prolific fluid over them, correſponding with the milt in the finny tribe. Butler, Swammerdam, Maraldi, &c. carried matters to a much higher pitch of extravagance; they imagined even that it was ſufficient for the female to be for ſome ſhort time in the company of the males to become fruitful, conceiving that the fumes ſhe would imbibe from them would vivify the eggs within her womb. Reaumur thought he diſcovered the union of the drone with the female, as in moſt other animals; his obſervations are not however completely ſatisfactory on this head, although his conjecture has received at length the ſanction of indubitable authority. The diſcoveries of Huber prove him to have been in the right. Huber, diſſenting from the abſurd conceptions of ſome preceding writers, affirms that the intimate aſſiſtance of the male is required in this affair. He tells us, that the eggs are impregnated by the male, while in the ovaria of the female bees: and gives as a reaſon why this connection of the ſexes has not been obſerved before, that it never takes place within the hive. For this purpoſe the bees reſort into the fields, firſt the female eſcapes from the hive upon a certain ſignal, and the ſwarm immediately follows. If in the firſt flight the female be not impregnated by ſome one of the male attendants, ſhe returns to the hive, and takes a ſecond flight preciſely in the ſame manner, but does not afterwards return without being fecundated. Huber ſuppoſes that this ſingle conſummation of its deſire is ſufficient to vivify all the eggs ſhe may lay for the ſpace of two years after, or even of thoſe laid by her during life, which muſt amount to many millions, ſince ſhe lays four or five thouſand at once, or even ten thouſand in a month. But the male, who contributes his aſſiſtance to give life to this numerous brood, has never the pleaſure of ſeeing his poſterity, for he dies in the accompliſhment of the duty impoſed on him by nature; the ſexual organs remaining too firmly fixed in the body of the female to be withdrawn, he is deprived of them in his ſeparation from her, and left to periſh miſerably.

One of the moſt perſuaſive arguments in favour of Huber's idea reſpecting the working-bees being originally of the female ſex, and not neuters, as is almoſt univerſally believed, may be drawn from the recent diſcovery of Mr. Kirby, who found that the antennæ in both the female and the neuter contain the ſame number of joints. While we tacitly admitted the aſſertion of Linnæus, that there were no leſs than five articulations more in the attennæ of the neuter than the female bee, it required no ſmall ſhare of credulity to believe that ſuch an aſtoniſhing difference in the formation of theſe organs could be produced by the mere effect of feeding the creature under the larva form in one particular manner inſtead of another; but this miſtake being aſcertained, removes one difficultly moſt certainly, namely, the impoſſibility of the working bee having been transformed into a queen, if it does not go very far to prove the fact itſelf. There are, it muſt be owned, however, ſome other objections of a ſimilar nature, which ſtill remain to be removed. Mr. Kirby, than whom we know no firmer advocate for the opinion of the working bees being ſtrictly neutral from their origin, does not appear to have been aware, when he corrected this miſtatement of Linnæus, that his remark would tend, in one material point, to ſupport an idea ſo contrary to that which he entertains himſelf in this reſpect.

Mr. Wildman, who, from his conſtant habit of rearing bees, was perfectly converſant with their attachment to the female, or queen bee, relates one curious particular; the manner in which he could cauſe a ſwarm of bees to follow him, and alight in any particular ſpot he might think proper. "Long experience," ſays this writer, "has taught me, that as ſoon as I turn up the hive, and give it ſome taps on the ſides and bottom, the queen immediately appears to know the cauſe of this alarm, but ſoon retires again among her people. Being accuſtomed to ſee her ſo often, I readily perceive her at firſt glance; and long practice has enabled me to ſeize her inſtantly with a tenderneſs that does not in the leaſt endanger her perſon; this is of the utmoſt importance; for the leaſt injury done to her brings immediate deſtruction to the hive, if you have not a ſpare queen to put in her place, as I have too often experienced in my firſt attempts. When poſſeſſed of her, I can, without injury to her, or exciting that degree of reſentment that may tempt her to ſting me, ſlip her into my other hand, and returning the hive to its place, hold her there, till the bees, miſſing her, are all on wing, and in the utmoſt confuſion. When the bees are thus diſtreſſed, I place the queen wherever I would have the bees to ſettle. The moment a few of them diſcover her, they give notice to thoſe near them, and theſe to the reſt; the knowledge of which ſoon becomes ſo general, that in a few minutes they all collect themſelves around her, and are ſo happy in having recovered this ſole ſupport of their ſtate, that they will long remain quiet in their ſituation. Nay, the ſcent of her body is ſo attractive to them that the ſlighteſt touch of her along any place or ſubſtance, will attach the bees to it, and induce them to take any path ſhe takes."

Bees, *Preſervation of.* The preſervation of theſe induſtrious and uſeful creatures deſerves every conſideration. This depends chiefly on ſupplying them with a ſufficient quantity of food, guarding them from their enemies, and deſpoiling them of the produce of their labour without deſtroying them. Beſides the attention which ſhould be beſtowed upon the neceſſities of bees, in the choice of an eligible ſituation for the Apiary, it may be neceſſary to feed them towards the cloſe of autumn, in the winter, or in the ſpring, when they have conſumed their winter ſtock. This ſhould be done, eſpecially in cloudy, miſty weather, when they go abroad but little, and when ſeveral days of bad weather immediately follow their ſwarming. Mr. Thorley directs, that no hive ſhould be kept which does not weigh twenty pounds; and that the ſupply ſhould be given in quantities of honey, which

which is their proper food, not less than a pound and a half or two pounds at a time. The honey should be first diluted with water, or small beer, and then poured into an empty comb. A drone comb is the strongest and best for the purpose; and in the evening, when the bees are quiet, the hive should be gently raised on one side, and the comb put under it, the contents of which will be conveyed away the next day into the several magazines.

Reaumur recommends a plate of liquid honey unmixed with water, crossed with straws, and covered with a paper full of holes, through which the bees will suck the honey without daubing themselves. But care should be taken that the hive be well guarded from robbers, whenever it is provided with a fresh supply. The winter quarters of the bees should likewise be well secured, both against the weather and the enemies that would annoy them. Mild winters, as well as severe cold, are injurious; sunshine in winter tempts them to go abroad, and exposes them to the fatal effects of sudden changes either of cold or rain. Bees are most likely to survive in cold winters, because they are then in a torpid state, and require very little nourishment, provided the apiary be well secured from the keen effects of northerly and easterly winds; whereas a small degree of warmth enlivens them, when they too often consume their winter stock, and are left destitute of food in a wet unfavourable spring. When bees are chilled with cold, and to all appearance dying with cold, and the clusters of them are broken, so that they drop down in the hive, they may be recovered oftentimes by the means of heat. Some have advised the application of hot or warm ashes to be laid about the hives, or sprinkled over the clusters of bees which lie seemingly dead at the bottom of the hive. A sufficient warmth may be given them by putting them into an handkerchief, and breathing upon them, or by laying them before a fire. This precaution should be taken immediately when the symptoms of disease are shewn, otherwise their vitals may be impaired, and the bees be irrecoverably lost. Reaumur made many attempts to preserve the bees from the ill effects of cold in the winter without removing the hives out of the places where they stand in the summer. With this view, he covered some of the hives with straw, by means of sticks fixed round them, and reaching a few inches above the top; but the most successful method he found to be that of preserving them in large tubs, with earth or hay, contriving at the same time to convey air to them through a square tube of wood two inches in width, and half an inch in depth, which passed through the side of the tub, and was of such a length as to reach the mouth of the hive, projecting at the same time three or four inches beyond the sides of the tub. Since the time of Reaumur many ingenious contrivances have been devised to obviate this, and other objections, against the hives that were formerly in use. A new kind of hive contrived by M. Huber of Geneva, seems to have obtained celebrity upon the continent at this time. There are also others constructed by Palteau, Maffee, Boisjagan, Blangy, Saint de Foy, Rarenal, &c. well deserving the attention of the farmer. The agricultural committee in Paris has been recently engaged in the examination of the best, most oeconomical, and advantageous kinds of hives, when M. Lombard, a gardener near that city, presented one for their inspection on a plan entirely new, under the name of "*ruche villageoise*," the contrivance of which was very much approved. For the sake of preserving the bees, due attention should be paid to the situation in which the hives are placed: they ought to be stationed in gardens stored with sweet-scented plants, fruit trees, and the like. The hives should not be placed too near to these, because they harbour vermin injurious to the bees, and still more, weeds must not be allowed to flourish close to the hives, since they nourish others far more detrimental to the bees than the former.

It is no unusual circumstance for one colony of bees to attack and plunder the hive of another. This happens chiefly in the spring and autumn. The most effectual way to guard against their incursions, is to lessen the entrance into the hive, so as to leave room for only two or three bees to pass a-breast, or to stop up the hives that are attacked, till the rovers disappear; or if strangers have gained admittance, the proper inhabitants of the hive may be roused to self-defence by disturbing them with a bunch of stinking madder fastened to the end of a small stick, which will instantly raise their resentment, and make them seize upon the robbers. This is indeed needless while the queen of the hive attacked is safe.

Bees, *Enemies of.* In the domestic state the bee has many enemies: but in a state of nature these are far more numerous. While in the apiary, wasps and hornets are among the most formidable of those enemies; they will often contrive to enter the hive, and build their nests in it, and harass the bees without mercy, till they leave their habitation, unless proper care be taken to prevent such encroachments. The fox is a dangerous enemy in the winter, as he is able to make a passage into the hive, and devour the honey. Rats are equally injurious; the house and field-mice should also be guarded against, by diminishing the entrance into the hive, as the cold comes on, when the bees become less able to defend themselves. The hives may be placed in such a manner that it will be impossible for the mice to reach them. Birds are bitter enemies to the bees; the sparrow, house-lark, and swallows in particular. Toads and frogs will place themselves at the entrace of the hive, and devour many. Spiders will expand their snares near the hive, and entrap numbers. The species *aranea calcina* lies in ambush for the bees in the corolla of flowers, and fastens upon them when they come to sip the nectareous fluids. Ants of almost every kind penetrate into the hive, attack the young brood, and plunder the combs of the honey. The stink of certain species of ants is so offensive to bees, that they will quit their hives to avoid it, or if they remain, become sickly. Some larvæ, or caterpillars, are likewise exceedingly injurious to the bees, the honey, the comb, and hive. *Phalæna mellonella*, or honey moth, too frequently secures its residence in the hive, and deposits its eggs; which hatching produces a larva of a pale flesh colour, that subsists entirely on the honey. The eggs of another phalæna, the wax moth, *P. cerella*, give birth to far more destructive larvæ than the former: for these no sooner burst from the eggs, than their operations commence; they attack the comb, which they perforate in a variety of intricate passages, burrowing and feeding as they proceed, till they reach the bottom of the cells in which the bees are lodged; here they remain in security, and not uncommonly compel the colony of bees to leave their residence. The old combs are those that are generally infested by this creature. A third sort of moth, *phalæna sociella*, breeds likewise in the honey-combs of some bees. Hives of bees that have swarmed more than once, and such also as contain but little honey, are most exposed to the depredations of these insects; for the half-exhausted combs serve to shelter them, and the scanty store of honey or wax supplies them at least with food to the detriment of the colony. Bees are subject also to a peculiar species of *pediculus*, called the bee-louse. Hives of bees that have swarmed more than once, and such as contain but little honey, are most exposed to those troublesome vermin. The hives in this case should be cleaned at the farthest once every week, and the stools on which they stand every morning, for the latter are likely to harbour the larvæ and moths, or other insects, as well as the hive.

hive. But these obnoxious creatures cannot be entirely extirpated without taking away the infected hive, removing the bees, and cleansing it, before it is restored to the former station. The lice of bees are of a slender shape, or filiform, and of a ferruginous colour, and may be destroyed by strewing tobacco over the bees. In a wild state the common honey-bee inhabits the cavities of hollow trees, where they are unavoidably exposed to a prodigious host of enemies, especially field and wood-mice of every description, rats, and birds. Of the bird tribe in particular, some species are supposed to feed exclusively on bees, such as the honey-buzzard (*falco apivorus*), the European bee-eater (*merops apiaster*), &c. woodpeckers, the kingfisher, and many others: they do not feed, indeed, exclusively on them, as is imagined, but they are formidable enemies to the bees in a wild state. The animals and birds which prey upon exotic honey-bees are numerous likewise; of this kind we might instance the various species of ant-eaters (*myrmecophagæ*), the black bear (*ursus arctos*), the honey cuckow (*cuculus indicator*), peacocks, &c.

Bees, *Maladies of.* In the spring the bees are subject to a kind of dysentery, which proves often fatal. The matter which they void at this time, when so affected, instead of being of a reddish yellow colour, is of a muddy black, and has an intolerable smell. Columella supposed this annual distemper to be occasioned by the bees extracting too freely the juices from the blossoms of the spurge and elm trees, or, as others believe, from the lime tree. There are writers who, dissenting from this opinion, attribute it to the quantity of new honey, of which they are known to eat to excess at that season of the year. Again, others imagine that it is caused only by their long stay in the hive during the winter, when they are constrained to feed on the coarse wax, if their honey fails to afford them a sufficient quantity of food. Madame Vicat, in the "Memoires, &c." of the Berne Society for 1764, ascribes this distemper to the honey which the cold has candied in the hive during winter. The true cause of this distemper seems to be unknown; but it is certainly contagious and very destructive. A good remedy for it was long unknown. Aristomachus recommends the removal of the vitiated combs. For the recovery of the bees affected with this distemper, a new remedy has been adopted upon the continent: they prepare a syrup composed with an equal quantity of good wine and sugar, which is administered to the bees in every hive, either by pouring it into the cells, or placing it within the hive in a saucer, or any other shallow vessel; this has been found an excellent restorative.

About the end of the spring, another disorder sometimes makes its appearance, which Du Carne de Blangy calls a "vertige," or vertigo. This is supposed to be occasioned by the venomous properties of certain plants on which they feed. The symptoms are manifested by a dizzy manner of flight, by their involuntary startings, falls, and other gestures, in attempting to perform their usual operations, or in approaching the hive, and by the lassitude that succeeds these symptoms. This distemper has been hitherto found incurable.

Bees are liable to a third distemper, the symptoms of which are a swelling at the extremity of the antennæ, which becomes also much inflamed, and of a yellow colour; the head assuming shortly after the same tint, the bees lose their vivacity, and languish till they die, unless a proper remedy be applied. In France, they give them Spanish wine for this disorder.

There is still another distemper which sometimes makes its appearance among bees, for which the continental agriculturalists administer Spanish wine, as in the former cases. This is a kind of pestilence by which many bees are cut off. It happens when the queen bee has placed the eggs carelessly in the comb, so that the larvæ perish in the cells, or that they are killed by the cold, or bad management in nourishing and feeding them; when numbers die, and infect the rest. The only attention requisite in this case is to take away the infected combs, scent the hive with the perfume of aromatic plants, and give them the wine to sip, as above mentioned, in order to strengthen and restore them from their sickness.

For the methods of preserving bees in hives and boxes, and for collecting the produce of their labour, see Hive, Honey, and Wax.

Honey-Bees, *Varieties and Species of.* The cultivation of the common honey-bee, in the warmer countries of Europe, being an object of the utmost consequence to the farmer, every means that ingenuity could devise to improve the breed and management of these profitable creatures have been adopted, and with success. They distinguish three kinds or varieties of the common bee (*apis mellifica*). The first is large, and of a deep brown colour; the second is smaller and blackish: those of the third sort called "the little Flemings," or "little Hollanders," are much smaller than either, and of a fine glossy yellow colour. It is the latter that is very generally cultivated on the continent at this time. Apis mellifica is an European insect. Mr. Hunter supposes it an inhabitant of Asia and Africa also; its appearance in America may be accounted for on the presumption that it was originally introduced there from Europe, and in the course of time has become completely habituated to that climate. It is said to have been originally peculiar to the continent of Europe, but this will admit of doubt. In those parts of Asia and Africa nearest to the south of Europe, they cultivate the same kind as ourselves. There are some other species of bees domesticated like the common bee with us, in different parts of the world; and others again, whose wax and honey are sought after by the natives, who do not care to take the charge and trouble of domesticating them. In Cayenne and Surinam, the species called by Olivier *amalthea*, is an abundant and most profitable creature. This little bee is of a black colour, with white wings and long posterior feet. They build their nest, in the shape of a bag-pipe, upon the tops of the highest trees. The honey is very sweet and agreeable, and thin, and of a reddish colour. From the latter the Indians extract a spirituous liquor, of which they are passionately fond; of the wax they make candles. This is supposed to be the small black innoxious wood-bee of Barrère, which is called *ouano* in Cayenne. M. Latreille mentions this species, and also another, which he calls "l'abeille sociale" (*apis socialis*), among his "apiares domestiques," an insect rather smaller than the common honey-bee (*mellifica*), that is found in India. Specimens of it, he tells us, were received at the museum of natural history in Paris, among a collection of other insects from Bengal. If we are not mistaken in the species, the same kind was likewise introduced into the cabinets of the curious in this country, about twelve months since by Mr. Fichtell, who found it to be very commonly cultivated by the inhabitants in the vicinity of Bengal.

Wild Bees. Except those species of the bee tribe which are subservient to the purposes of human life, mankind has shewn a manifest degree of inattention to this curious race of creatures. Some few naturalists have regarded them as objects of amusement: and what the common observer is content to name a wild bee, without further inquiry, is discriminated by them as forming many distinct families; each of which have their peculiar manners and mode of life, and display a greater or less proportion of economy, skill, industry, &c. by no means unworthy of being more minutely attended to. Of the wild bees there are certain natural families, whose distinctive characters, in a scientific point of view, have been described already; they are distinguished also by their man-

ners of life, the formation of their nests, and many other particulars. Some are called leaf-cutters, others wood-piercers, masons, earth-diggers, &c. corresponding with what the French call "abeilles coupeuses, abeilles pierce-bois, abeilles maçonnes, abeilles qui creusent la terre," &c. Under each of these families many species are arranged by entomologists. A similar mode of nidification (it has been well remarked) may be, and indeed very often is, the characteristic of a family, or rather that of a species; thus the cells of the different species of bombinatrices are composed of similar materials, and resemble each other in form; and the various genuine species of the genus Vespa *(Wasp)* construct cells, for the most part, of the same figure, and employ the same kind of materials, according to Reaumur; the mode of nidification, therefore, should never be assumed as characteristic of a species, but after the most mature consideration, and the closest investigation of its history; for it generally happens that those insects which agree together in habit, and belong to the same natural divisions or subdivisions of a genus, are connected likewise by their mode of life.

Of the leaf-cutters there are several species; these are so named because they cut the leaves of trees, chiefly those of the rose, into pieces of a convenient size to compose their little cells, in which the eggs of the future brood are deposited. This description of bees is injurious; the female perforates the solid timber of trees in a surprising manner in order to place her eggs (which are carefully wrapped up in these cylindrical pellets, if they may be so termed, of leaves), within the cavity. The hollow or pipe which she bores for their reception is usually about the thickness of a small finger, but the depth is very various, being from a few inches to a foot or more; the whole cavity is filled with those little pellets, each of which contains an egg, with a provision of honey for the larva when hatched; so nicely are these pellets formed that they precisely fit the cavity in diameter, and are placed one above the other from the opening to the very bottom of the cavity. Apis centuncularis is one of the species belonging to this natural family. There are others which belong to it likewise, that construct their cells in the same manner, of leaves, but place them in cylindrical cavities in the earth, instead of timber. Some line or envelop their nidus with the downy substance collected from the woolly leaves of particular plants; the tapestry bee employs the tender petals of the rose to line its cells, &c. The mason bees are also singular for the mode of nidification which they adopt. Reaumur has entered at length into its history, a brief account of which must close our general remarks upon the subject for the present, since these must be again repeated when speaking of the respective species, or of the families to which those habits are peculiar.—"The female of these bees (for the males, like the drones of the hive-bee, do not work, and these insects have only two sexes) undertakes the whole labour of the building, and is at the same time both architect and mason. Her first step is to fix upon an angle, sheltered by any projection, on the south side of a stone wall. Sometimes she contents herself with a more exposed part of the surface, where the stone happens to be uneven, and fit for her purpose. Having chosen a spot proper to receive the foundations of the future mansions of her offspring, her next care is to provide materials. As her house is to be built entirely of a kind of mortar, the basis of which must be sand; she is very curious in her choice of it, selecting it grain by grain, from such as contains some mixture of earth. To soften her labour, before she transports it for use, by means of a kind of saliva, which is very viscid, she glues as many grains as she can carry into a little mass, about the size of a small shot. Taking this up with her mandibles, she conveys it to the spot she has fixed upon for the seite of her cottage. A circular plane, composed of many of these little masses, forms the basis on which it is to be erected; it contains from three to eight cells, which are similar to each other in their form, and equal in dimensions. Each cell is about an inch in length, and six lines in diameter; and, before its orifice is closed, in form resembles a thimble. When its walls are raised to a sufficient height, our little mason lays up in it a store of pollen seasoned with honey, for the sustenance of its future inhabitants; sometimes the proportion of honey is so great that this provision is entirely liquid. This business settled, she deposits her egg, finishes and covers in the cell, and then proceeds to the erection of a second, which she furnishes and finishes in the same manner, and so on with respect to the whole nest. These cells are not placed in a line, or any regular order; some are parallel with the wall, others are perpendicular to it, and others are inclined to it at different angles; this occasions some empty spaces between the cells, which this laborious architect fills up with the same kind of cement, and then bestows on the whole group a common covering, made with coarser grains of sand; so that at length the nest becomes a mass of mortar, very hard, and not easily penetrated, even by the blade of a knife; its form is more or less oblong; its colour depends on the colour of the sand employed in its construction."—Another species forms its nidus, with earth intermixed with chalk, upon stone walls; and a third for the sake of greater security prefers the hollows and cavities in the stone itself for this purpose.

Bees, Wild Honey, *Hunting of.* In the Philosophical Transactions, No. 376, Mr. Dudley speaks of a method of hunting bees in order to discover the spot in which their nests are secreted, as practised some years ago in the woods of New England in America. It consists merely in catching a bee, then letting it fly, and duly observing the way to which it directs its course; this points out to the hunter the direction in which the nest is to be sought after. To find the distance, he takes an off-set of an hundred perches, and then lets fly another bee, but which must be of the same nest; and it is asserted, that the angle or point where these two courses intersect, is the spot in which the nest is concealed.

Bees, *Swarming of.* See Swarm.

Bees, *Writers on.* Many authors have written on bees. Among the ancients, Aristomachus is said to have studied them sixty years. Phillisius retired into a desert wood, that he might have the opportunity of observing them to better advantage; Aristotle made a great number of curious observations on this insect, which Virgil has put into Latin verse: they have been enlarged and confirmed by Pliny and others. Theophrastus has a fragment still extant, Περὶ μελισσῶν, *concerning bees*; or, as entitled in Laertius, Περὶ μέλιτος, *of honey.*

Among the moderns, the number of writers who have treated on bees is very great, a few only of which it will be expected in this place to mention. Prince Frederic Cesi, institutor of the Roman Academy of Sciences, wrote expressly on bees, as did also Swammerdam, Maraldi, and Reaumur, each of whom have treated minutely of them. Schirach is a distinguished writer on this subject. Hattorff deserves notice. Among the English, Butler, Gurney, Mills, Levett, Thorley, Southern, Remnant, Rudden, Wander, White, Wildman, Debraw, Hunter, and others, have published discourses on the management of bees, &c. Writers who have treated scientifically of the species in their entomological works, are such as Linnæus, Fabricius, Geoffroy, Schæffer, Villiers, Poda, Rœsel, De Geer, Fourcroy, Donovan, Coquebert, &c. A monographia of bees has lately appeared in this county by Kirby, and another in France about the same time by Latreille. Nor should we omit to mention several works of reputation on this subject that have

been publiſhed on the continent within the laſt few years: of this deſcription are the work of Huber of Geneva; "Le Mémoire de Bernard ſur l'Education des Abeilles;" "Le cours d'Agriculture," by Rozier; "Abregé de l'Hiſtoire des Inſectes pour ſervir l'Hiſtoire Naturelle des Abeilles," by Bazin Gilles Auguſtin, firſt publiſhed in 1747; "Le Manuel Néceſſaire au Villageois pour ſoigner les Abeilles," by Lombard; and the works of Berthaud, Duchet, Ducarne, Blangy, Della Rocca, &c.

Bee, in *Aſtronomy*. See Apis.

Bee is alſo uſed figuratively to denote ſweetneſs, induſtry, &c. Thus Xenophon is called the Attic bee, on account of the great ſweetneſs of his ſtyle. Antonius got the denomination meliſſa, or bee, on account of his collection of common places.

Leo Allatius gave the appellation of *apes urbanæ* to the illuſtrious men at Rome, from the year 1630 to the year 1632.

Bee-*bird*, in *Ornithology*. See Trochilus minimus; the bee humming bird, or *le plus petit Oiſeau mouche* of Buffon. Some refer this name likewiſe to Trochilus Bicolor of Gmelin, the *Colibri* of *Ferm.* Surin. N. 2.

Bee, *Black*. See Æthiops.

Bee-*Blocks*. See Blocks.

Bee-*boxes*. See Hive.

Bees-*bread*. See *Bee* Bread, Farina, and Bee *ſupra*.

Bee-*eater*, in *Ornithology*. See Falco Apivorus, *Honey Buzzard*.

Bee-*flower*, or Orchys, in *Botany*. See Ophrys.

Bee-*glue*, a ſoft unctuous matter employed by bees to cement the combs to the hives, and to cloſe up the cells.

Bee-*hive*. See Hive.

Bee-*humble*, *humming bee*, wild bee, ſynonymous with the Bourdon family of bees, adopted by French writers.

Bee-*humble fly*. See Bombylius.

Bee, *Order of*, was inſtituted at Sceaux in France, for men and women, in 1703, by Louiſe, wife of Louis of Bourbon. The enſign is a medal of gold, bearing on one ſide the portrait of the foundreſs, and on the other a bee, with this motto, "Je ſuis petite, mais mes pictures ſont profondes."

Bee-*rocks*, in *Geography*, lie on the coaſt of France, a little to the weſt of North from the point of St. Maloes. They are called the Great and Little Bee; the latter of which is weſt of the other, and lies N. W. from the town about a gun-ſhot. On each of the bee-rocks is a little houſe. Ships may ſail within a cable's length of the outermoſt or Little Bee, and anchor on the ſouth of it in 5 or 6 fathoms at low-water, when Bore tower, on the ſouth of St. Maloes, is a little eaſt of the ſmall tower on the point to the ſouth of the town.

BEECH-tree, in *Botany*. See Fagus.

Beech *galls*, in *Natural Hiſtory*, the name of a ſpecies of galls or protuberances found on the beech-tree, and ſerving for the lodgment of inſects.

Theſe galls are found on the leaves of the beech, and are ſometimes only one upon a leaf, ſometimes more; they always grow from the ſame point, owing, no doubt, to the fly's having laid ſo many eggs in the ſame ſpot.

Theſe galls are of an oblong figure, and ſomewhat flatted. They reſemble the ſtone of a plum in ſhape, and are ſo hard that they are not to be broken between the fingers; their ſubſtance ſeems of the ſame nature with that of a nut ſhell. In each gall there is only one cavity, inhabited by a white worm, which in time paſſes through the nymph ſtate into that of the fly, to which it owed its origin.

Beech-*maſt*, the fruit of the beech-tree. It fattens hogs and deer, and has ſometimes ſupplied men inſtead of bread. Chios is ſaid to have endured a memorable ſiege by means of it.

Beech, *Oil of*, *Huile de Faine*, the fruit of this tree, the beech-maſt, is an oily farinaceous nut highly nutritious to hogs, poultry, and other animals, and like the other fruits of this deſcription may be made to yield a very large quantity of pure oil by preſſure. This oil has long been prepared in ſeveral diſtricts in the ſouth of France. An intereſting account of this manufacture is publiſhed in the Journal de Phyſique for 1781, by Mr. Verdier.

The taſte of the beech-maſt is mild, unctuous, and ſomewhat aſtringent. About the month of October it falls ſpontaneouſly from the tree, and is collected in this and the ſucceeding month. When gathered and picked it is ſlowly dried in the ſhade, or with the heat of a very gentle ſtove; after which it is at any time fit to be preſſed for the oil. The very fineſt oil is made with the beſt nuts picked out by hand, but for the larger quantity the maſt is ſifted and winnowed like corn. It is then ground by a machine ſimilar to a ſtamping mill, formed of upright beams of wood alternately riſing and falling, ſet on motion by a large wheel, and when the fruit gets too dry in the mill a little water is added. When ground ſufficiently fine, it is wrapped up in a coarſe hair cloth once doubled, and ſubmitted to the ſame kind of preſs which is employed for coleſeed, and other oils.

The beech oil, when well made, and from the beſt ſelected fruit, is equal to the beſt olive oil, and with this advantage, that it will keep much longer; olive oil beginning to grow rancid in about a year and a half, whereas the other improves by keeping, to the ſixth or eighth year. It is fit for uſe a month after it is made. To obtain the fineſt oil, beſides the perfection of the fruit, it is neceſſary that the working of the mill in which it is ground, ſhould be very moderate, ſo as not to overheat it.

The water uſed to give the fruit a proper conſiſtence in grinding, mixes with the oil when preſſed, ſo that it requires ſome weeks repoſe to allow them to ſeparate. In general the oil ſtands about three months to clarify, after which it is drawn off clear from the water and dregs, and packed up either in bottles or in very cloſe caſks. The general yield of oil is about ten pounds from $4\frac{1}{3}$ buſhels, Paris meaſure.

The uſes to which it is applied are all thoſe of the common fixed vegetable oil. The beſt ſorts are equally grateful for the table as the beſt olive oil. The inferior are uſed for lamps, for preparing leather, and other purpoſes of economy and manufacture.

The cakes that remain after the oil is preſſed out are particularly uſeful in the fabrication of the oil from nuts, as this latter fruit is not alone of a proper conſiſtence for the preſs, but muſt be mixed with ſome more ſolid ſubſtance to make it work well. Beſides this, the cakes of beech-maſt are proper for fattening animals, or make a very good fuel.

An attempt was made in the beginning of the laſt century to introduce the preparation of beech maſt oil in this country. The poet and ſpeculator, Aaron Hill, obtained a patent for this manufacture, and went to ſome expence in eſtabliſhing it in England about the year 1714. It would appear from a letter of his to the earl of Cheſterfield (in the Harleian Collection, and inſerted in the Monthly Magazine for 1803, p. 339,) that he had formed very ſanguine hopes of the ſucceſs of this plan. However he was obliged ſoon to abandon it, probably in part from a want of a proper ſupply of the fruit, and certainly in a conſiderable degree from the very limited uſe of oil as an article of food in this country.

BEEF, in *Domeſtic Economy*, the fleſh of black cattle prepared for food. The fleſh of the *bos* or ox hind, ſays Dr. Cullen (Mat. Med. vol. i. p. 369,) is the moſt denſe of all the quadrupeds; and how far that denſity goes in preventing ſolubility, we have an inſtance in the bull, whoſe fleſh is ſeldom choſen as a part of our diet. The fleſh of the female ſex is of a more ſoluble nature, and ſufficiently fit for nouriſhment; but we commonly prefer the caſtrated ox, in which the fat is better mixed, and as more alkaleſcent, the fleſh is more ſapid;

ſapid; and, unleſs it be from a very old animal, is generally to be preferred. The chief difference of alimentation in the ox kind is that which appears between the old and young. This author obſerves, that beef, though of a more firm texture, and leſs ſoluble than mutton, is equally alkaleſcent, perſpirable and nutritious. See Food.

Beef-eater, in *Ornithology*, the Engliſh name of *Buphaga Africana*, a bird found on the banks of the rivers in Senegal, and the only ſpecies of the genus known. See Buphaga.

Beef-*iſland*, in *Geography*, a ſmall iſland near the coaſt of America, in the ſouth-eaſt angle of the bay of Campeachy, the weſt end of which is waſhed by the eaſtward opening of St. Peter and Paul river. It lies cloſe to Trieſte iſland, is 7 leagues long, and from 3 to 4 broad, and has a fine ſandy bay, where ſhips may ride in 7 or 8 fathoms and be well ſheltered. N. lat. 18° 30′. W. long. 91° 30′.

Beef-*iſland* is alſo one of the ſmaller Virgin iſlands in the Weſt Indies, ſituate between Dog iſland on the weſt, and Tortola on the eaſt, in ſir Francis Drake's bay. It is about five miles long, and one broad. N. lat. 18° 23′. W. long. 63° 2′.

BEEKMAN, a conſiderable townſhip of America in Dutcheſs county, New York, containing 3,597 inhabitants, including 106 ſlaves. In the State cenſus of 1796, there appear to be 542 electors in this townſhip.

BEELE, in *Mining*, an inſtrument uſed by the workmen to break and pick out the ore from the rocks in which it lies. This inſtrument is called by the tinmen in Cornwall a "tubber." It is an iron inſtrument of eight or ten pounds weight, made ſharp, and ſteeled at both ends, and having a hole in the middle, where the handle is fixed in. When the ore lies in hard rocks, this inſtrument wears out ſo faſt, that it muſt have new points made to it every fortnight. The miners who dig up the ore in the mines, are, from the uſe of this inſtrument, called beele-men; and thoſe who attend them, and whoſe buſineſs it is to take up the matter the others looſen or break up, are, from their inſtrument, which is a broad and hollow iron ſhovel, or a wooden one, with a very ſtrong iron lip, called the "ſhovellers." In Cornwall, when the ore lies in a hard bed, they allow two ſhovellers to three beele-men; and when it lies in a ſoft and earthy matter, two beelemen and three ſhovellers are the proportion. Phil. Tranſ. N° 69. p. 2104.

BEELIKE, in *Geography*, a town of Germany, in the circle of the Lower Rhine, and duchy of Weſtphalia, 4 miles weſt of Rhuden, and 10 E.N.E. of Arenſberg.

BEELZEBUB, or Baalzebub, i. e. *the lord of a fly*, in *Ancient Mythology*, was a god of the Philiſtines, and had a temple and oracle at Ekron. (2 Kings, i. 2.) From this paſſage it appears, that the name was not given to this object of idolatrous worſhip by way of contempt; becauſe it was uſed by Ahaziah at the very time when he was acknowledging his divinity, and deſirous of conſulting him concerning his recovery. This is farther evident, from the meaning of the appellation and the reaſon of its being given. Hiſtory informs us, that thoſe who lived in hot climates, and where the ſoil was moiſt, which was the caſe with the Ekronites, who bordered upon the ſea, were exceedingly infeſted with flies; and theſe inſects were thought to occaſion contagious diſtempers. Pliny (N. H. l. x. c. 28. § 40.) mentions a people who ſtopped a peſtilence which had been thus occaſioned by ſacrificing to the "fly-hunting-god." It ſeems not improbable that ſome imagined cure of this kind, or a general perſuaſion of his power of driving away flies from the places they frequented, might be the reaſon why the god of Ekron was called Beelzebub. For it was cuſtomary with the heathens, to call their gods by the name of thoſe inſects from which they were believed to deliver their worſhippers. The "god of flies," Μυῖαν, and the "fly-hunter," Μυιαγρος, were titles aſcribed to Jupiter as well as to Hercules. Indeed, ſome of the Greek fathers thought, that this "fly-god" was worſhipped under the form of a fly; and it is obſerved by Mr. Young (on Idolatry, vol. ii. p. 91, 92.) that it was cuſtomary with the Heathens to repreſent their gods by ſome creatures that were ſacred to them. However, the ſuppoſed power of this god over that noxious inſect, the fly, ſeems to be the moſt probable reaſon of the name of Beelzebub. Beelzebub, therefore, being a title of honour, and as ſuch applied by his worſhippers to the god of Ekron, there is no reaſon for doubting, that it was in uſe among the Philiſtines, as well as among the Jews. (Bochart, vol. ii. p. 36. &c. Op. vol. iii. p. 500. Selden de Diis. Syr. Syntag. ii. c. 6. p. 227. ed. Amſt. 1680.) Among the Jews, the appellation Beelzebub, notwithſtanding its ſeeming meanneſs, could not be uſed as a term of deriſion. For the Jews had learned of the heathens to regard a power of driving away flies, as a divine prerogative: endeavouring to perſuade men, that the temple of Jeruſalem, though ſo many ſacrifices were daily offered there, never had a fly upon it: thus copying, rather than deriding, what the heathens fabled concerning ſome of their temples, into which, according to Pliny, Solinus, and others, no fly could enter. It has been ſaid, indeed, that the Greek word uſed in the New Teſtament, is not "Beelzebub," but "Beelzebul," which ſignifies the "lord of a dunghill;" and hence it has been inferred, that this name could not have been uſed by the Heathens; but muſt have been given by the Jews in deriſion. Jerom, however, not underſtanding the common reading, changed Βεελζεβουλ into Βεελζεβουβ; and this ſubſtitution has been approved by ſeveral critics, has been adopted in the vulgate, and thence tranſferred into Luther's tranſlation. In the ancient languages it was not uncommon to change *b* into *l* (ſee letter B;) and, on this ſuppoſition, the Greek word will agree with the Hebrew, (2 Kings, i. 2). But if Beelzebul be uſed as a different name from Beelzebub, there will be no reaſon for ſuppoſing that it was uſed by the Jews as an expreſſion of contempt. The Hebrew word זְבוּל, zebul, properly ſignifies "an habitation," and as Stockius obſerves, is applied to the heavens, the manſion of the deity. In this ſenſe it will agree with the title of Beelſemin, or Beelſamen, "the lord of heaven," which the Ekronites, and other Phœnicians, gave to their ſupreme numen. Whether, therefore, Beelzebub and Beelzebul be different names, or the ſame name with different terminations, they deſcribe the perſon whom the Heathens regarded as their chief deity.

Beelzebub, in the New Teſtament, (Matt. xii. 24. Mark, iii. 22.) is called αρχοντι των δαιμονιων, the prince of demons, (prince of the devils, Engl. Tranſ.); and it has been commonly apprehended, that demons and the prince are the ſame ſpirits as the devil and his angels. Satan and Beelzebub, ſay thoſe that adopt this opinion, (See Doddridge on Matt. xii. 25. Fam. Expoſ. vol. i. p. 391, note g. and Pegge's Anſwer to Sykes) are names for the ſame perſon; for when Chriſt was reproached with caſting out demons by the aſſiſtance of the prince of demons, he replied, "How can Satan caſt out Satan?" (Matt. xii. 26. Mark, iii. 23. Luke, xi. 18.) Now if Satan, who is conſidered as the ſame perſon with the devil (Rev. ix. 12. Matt. iv. 1. compared with Mark, i. 12.), was the prince of thoſe demons who were caſt out by Chriſt; then demons are the ſame ſpirits as the devil's angels. And on this ſuppoſition, there can be no other difference between demons and the devil than that which ſubſiſts between a prince and his ſubjects, who both partake of one common nature, though the prince, as preſiding over the reſt, hath a peculiar name of his own. Dr. Lardner (Caſe of Demoniacs, p. 42. Works, vol. i. p. 448.)

p. 448.) admits, that the devil, who is ſuppoſed to be the chief or prince of the fallen angels, is often called Satan and Beelzebub. Mr. Farmer is of opinion (Eſſay on the Demoniacs of the N. T. p. 16.) that it doth not follow from the above cited paſſage, that the devil is ever called Beelzebub. The term "Satan," he ſays, is not appropriated to one particular perſon or ſpirit, but ſignifies "an adverſary" or opponent, in general. The Jews called every demon by this name, and uſed it in the plural number; and the words of our Saviour, "How can Satan caſt out Satan," taken in their ſtricteſt ſenſe, imply that there were ſeveral Satans: ſo that our Lord might only mean, "that it was unreaſonable to ſuppoſe that one demon would caſt out another." Or if you underſtand him to the following purpoſe: "were Beelzebub, whom you regard as the chief of the *poſſeſſing* demons, to expel himſelf, which would in effect be the caſe were he to expel his agents and inſtruments, he would act againſt his own intereſt, and defeat his own ſchemes;" it will not follow, that Beelzebub was conſidered as the ſame perſon with the devil. There ſeems to be no reference to the latter. He and Beelzebub might be regarded as two diſtinct perſons; and yet each be called "Satan," an adverſary, or opponent. "If Beelzebub and his demons were, in our Saviour's time, conceived to be the very ſame perſons as the devil and his angels, is it not very ſurpriſing," ſays this author, "that the New Teſtament, in its original language, ſhould always ſpeak of the diſeaſed perſons under conſideration as poſſeſſed by a "demon" or "demons," and never by "the devil" or "devils?" a word, as all muſt allow, that is never there applied to evil ſpirits in the plural number, whatever its uſe may be in the ſingular. He adds, "inaſmuch as Chriſt is here replying to the Phariſees, and reaſoning with them on their own principles, he cannot be ſuppoſed to ſpeak of a different order of beings from what they did. Satan, therefore, muſt be equivalent to demon, in the ſenſe in which demon was uſed by them." See Dæmon. "Should it then appear," ſays Mr. Farmer, "that by demons and their prince they underſtood human ſpirits, it will from hence follow, that Chriſt cannot be ſpeaking of ſpirits of a celeſtial origin." If by the devil, we are to underſtand a fallen angel, this writer thinks that he could not be the ſame with Beelzebub. The Jews, in their ancient writings, were not accuſtomed to call the devil by this name, but by that of Aſmodæus, or Samael; as Bochart, (Oper. vol. iii. p. 501.) Selden, (ubi ſupra, p. 231.) and others allow. Beelzebub, in the eſtimation of the Phariſees, was the prince of the "poſſeſſing demons," and therefore, as Mr. Farmer ſuppoſes, he was, in their eſtimation, a human ſpirit; and in proof of this he alleges the teſtimony of Joſephus (De Bell. Jud. l. vii. c. 6. § 3). Beſides Beelzebub was, as we have already ſtated, a heathen deity; expreſsly denominated in the Old Teſtament, the god of Ekron; and repreſented by the Phariſees under the ſame title and character as the heathens themſelves aſcribed to their gods. "If Beelzebub," ſubjoins Mr. Farmer, "was a heathen demon, or deity, he was no other than a deified human ſpirit: for ſuch were all the heathen demons, who were the more immediate objects of the public eſtabliſhed worſhip; and those in particular to whom divination and oracles were aſcribed. And if the prince of demons was of human extract, no doubt his ſubjects were ſo likewiſe.

BEELZEBUL, in *Entomology*, a ſpecies of Scarabæus that inhabits America. On the thorax is a triple prominence; and three horns on the head, the middle one larger than the others. Fabricius.

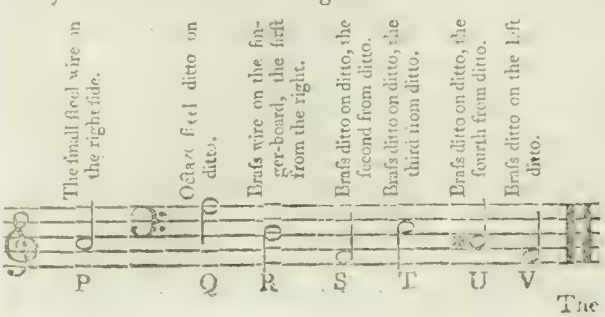
Beelzebul, in *Zoology*, a ſpecies of Simia that inhabits South America; and is tailed, bearded, and black; tail prehenſile; tip, with the feet, brown. Linnæus. This appears to be the *guariba* of Marcgrave; *howling baboon* of Bancroft; *preacher monkey* of Pennant; and *l'ouarine* of Buffon. It is ſaid to be about the ſize of a fox, of a black colour, and the hair of its fur long, gloſſy, and remarkably ſmooth. This is a fierce animal, and inhabits the woods of Braſil, and Guiana, in vaſt numbers; wanders in large flocks in the night time, and howls hideouſly. Dr. Shaw obſerves that this howling faculty is owing to the conformation of the os hyoides, or throat bone, which is dilated into a bottle-ſhaped cavity. Marcgrave, in ſpeaking of the guariba, acquaints us that one ſometimes mounts the top of a branch, and aſſembles a multitude below; he then ſets up a howl ſo loud and horrible, that a perſon at a diſtance would imagine that a hundred joined in the cry; after a certain ſpace, he gives a ſignal with his hand, when the whole aſſembly join in chorus, but on another ſignal, a ſudden ſilence prevails, and then the orator finiſhes his harangue. Virey calls this animal Beelzebut, retaining however at the ſame time the name *l'ouarine*, under which it is deſcribed by Buffon.

BEEMAH, in *Geography*, a river of Hindooſtan, which is a principal branch of the Kiſtnah, joining it near Edghir, riſes in the mountains, on the north of Poonah, probably not far from the ſources of the Godavery, and paſſes within 30 miles of the eaſt ſide of Poonah, where it is named Bewrah as well as Beemah. It forms the eaſtern boundary of Viſiapour, and paſſes about 80 or 82 geographical miles to the weſt of Golconda, croſſing the road from it to Ralicotte. The Beemah, according to Mr. Orme, poſſeſſes virtues ſimilar to those of the rivers eſteemed ſacred by the Hindoos: that is, ablutions performed in its ſtream have a religious efficacy ſuperior to those performed in ordinary ſtreams. Rennell's Memoir, p. 244, &c.

BEEMEN, or Sheemen, in *Aſtronomy*, ſeven ſtars of the fourth magnitude, following each other, in the fourth flexure of the conſtellation Eridanus.

BEEMSTER, in *Geography*, a large drained lake or marſh of North Holland. It was formerly a lake, covering a great extent of country, which, by the induſtry of the Hollanders, who, by means of various canals, have drained the waters, is converted into an excellent paſture ground. It has neither towns nor villages, but a great number of houſes, which are diſperſed along the ſides of the canals and roads.

BEEN, in *Muſic*, the name of an Indian fretted inſtrument of the guittar kind. The finger-board is 21⅝ths inches long. A little beyond each end of the finger-board are two gourds, and beyond theſe are the pegs and tail-piece which hold the wires. The whole length of the inſtrument is three feet ſeven inches. The firſt gourd is fixed at ten inches from the top, and the ſecond at about two feet 11½. The gourds are very large, about fourteen inches diameter, and have a round piece cut out of the bottom, about five inches diameter. The finger-board is about two inches wide. The wires are ſeven in number, and conſiſt of two ſteel ones, very cloſe together, in the right ſide; four braſs ones on the finger-board; and one braſs one on the left ſide. They are tuned in the following manner.



The

The great ſingularity of this inſtrument is the height of the frets: that neareſt the nut is one inch ¼, and that at the other extremity about ⅜ths of an inch, and the decreaſe is pretty gradual. By this means the finger never touches the finger-board itſelf. The frets are fixed on with wax by the performer himſelf, which he does entirely by ear.

The frets are nineteen in number. On the wires R and S, which are thoſe principally uſed, there is an extent of two octaves, a whole note with all the half notes complete in the firſt octave, but the *g* ♯, and *b* ♭ wanting in the ſecond. The performer's apology for this was, that he could eaſily get thoſe notes by preſſing the ſtring a little hard upon the frets *f* ♯ and *a* ♭, which is very true from the height of the frets; but he aſſerted that this was no defect in his particular inſtrument, but that all beens were made ſo. The wires, T, U, are ſeldom uſed, except open.

The been is held over the left ſhoulder, the upper gourd reſting on that ſhoulder, and the lower one on the right knee.

The frets are ſtopped with the left-hand; the firſt and ſecond fingers are principally uſed. The little finger of this hand is ſometimes uſed to ſtrike the note V. The third finger is ſeldom uſed, the hand ſhifting up and down the finger-board with great rapidity. The fingers of the right hand are uſed to ſtrike the ſtrings of this hand; the third finger is never uſed. The two firſt fingers ſtrike the wires on the finger-board, and the little finger ſtrikes the two wires. The two firſt fingers of this hand are defended by a piece of wire put on the tops of them in the manner of a thimble: when the performer plays ſtrong, this cauſes a very jarring diſagreeable ſound; whereas, when he plays ſoftly, the tone of the inſtrument is remarkably pleaſing.

The ſtyle of muſic on this inſtrument is in general that of great execution. I could hardly ever diſcover, ſays Mr. Fowke, any regular air or ſubject. The muſic ſeems to conſiſt of a number of detached paſſages, ſome very regular in their aſcent and deſcent: and thoſe that are played ſoftly, are moſt of them both uncommon and pleaſing. Aſiatic Reſearches, vol. i p. 295, &c. See *Plates* of *Muſic*.

BEER, a ſpirituous liquor, made from any farinaceous grain; but generally from barley. Accordingly, it is a liquor of very ancient and general uſe. See ALE.

The word is Saxon, formed from the German *bier*, of the Latin *bibere*.

Several authors have maintained, that there was no malt liquor known by the appellation of beer, as diſtinguiſhed from the ancient liquor called ale, till the uſe of hops was introduced. See HOPS. However, we find, by a ſtatute of the twelfth parliament of the 23d year of king James III. of Scotland, (c. 88.) that it was enacted, that no perſons ſhould mix wine or "beer," under pain of death. Beſides this inſtance, occurring in 1482, many others might be produced confuting the vulgar tradition, that beer, as a liquor, diſtinct from ale, was not known in England till the reign of Henry VIII. In the year 1492, we find a licence from king Henry VII. to a Fleming (cited in the 12th tome of the "Fœdera," p. 471.) for exporting fifty tons of ale, called "beer" or "bere;" and in the ſame year one of the king's attendants into France was a beer-brewer of Greenwich in Kent. Although it may probably be true, that beer, brewed with hops, was not known in England till after this time; yet other materials were uſed, before hops were known, for making the liquor that was called "beer," ſuch as wormwood, and other plants, which ſerved inſtead of hops, for preſerving malt-liquor, either by ſea or land.

Beer is made from malt by extraction with water and fermentation. With this view, a quantity of malt, freed from its germs, and ſufficient for one intended brewing, is coarſely bruiſed by grinding, and in the maſh-tub, firſt well mixed with ſome cold, then ſcalded with hot water drawn upon it from the boiler. It is afterwards ſtrongly and uniformly ſtirred. When the whole maſs has ſtood quietly for a certain time, the extract (maſh), or ſweet-wort, is brought into the boiler; and the malt remaining in the tub is once more extracted by infuſion with hot water. This ſecond extract, treated in like manner, is added to the firſt, and both are boiled together. This clear decoction is now drawn off, and called boiled wort. To make the beer more fit for digeſtion, and at the ſame time to deprive it of its too great and unpleaſant ſweetneſs, the wort is mixed with a decoction of hops, or elſe theſe are boiled with it. After which it ought to be quickly cooled, to prevent its tranſition into acetous fermentation, which would enſue, if it were kept too long in a high temperature. On this account, the wort is transferred into the cooler; where it is expoſed with a large ſurface to cold air, and from this to the fermenting tub, that by addition of a ſufficient portion of recent yeaſt it may begin to ferment. When this fermentation has proceeded to a due degree, and the yeaſt ceaſes to riſe, the beer is conveyed into caſks, placed in cool cellars, where it finiſhes its fermentation, and where it is well kept and preſerved under the name of "barrelled beer," with the precaution of occaſionally filling up the vacancy cauſed in the veſſels by evaporation. Or, the beer is bottled before it has done fermenting; and the bottles are ſtopped a little before the fermentation is completely over. By ſo doing, the bottled beer is rendered ſparkling. In this ſtate it frequently burſts the bottles, by the diſengagement of the carbonic acid gas which it contains: and it ſtrongly froths, like champaign, when brought into contact with air on being poured into another veſſel. Gren's Chymiſtry, vol. ii. p. 63. For the proceſs of brewing, particularly according to the Engliſh mode; ſee BREWING.

Beer, well prepared, ſhould be limpid and clear, poſſeſs a due quantity of ſpirit, excite no diſagreeable ſweet taſte, and contain no diſengaged acid. By theſe properties, it is a ſpecies of vinous beverage, and is diſtinguiſhed from wine, in the ſtrict ſenſe, and other liquors of that kind, by the much greater quantity of mucilaginous matter which it has received by extraction from the melted grains; but which alſo renders it more nouriſhing. "Brown beer" derives its colour from malt ſtrongly roaſted in the kiln, and its bitteriſh taſte from the hops. "Pale beer" is brewed from malt dried in the air, or but ſlightly roaſted, with but little or no hops at all.

Tacitus, in ſpeaking of the ancient Germans, as alſo Dioſcorides, Galen, &c. condemn beer, as prejudicial to the head, nerves, and membranous parts, as occaſioning a more laſting and more uneaſy drunkenneſs than wine, and as promoting a ſuppreſſion of urine, and ſometimes a leproſy.

Meſſ. Perrault, Rainſſant, and others, defend the modern beer: urging, that the hops uſed with us, and which the ancients were ſtrangers to, having a faculty of purifying the blood, and removing obſtructions, ſerve as a corrective, and free our drink from the inconveniences objected to that of the ancients. For the qualities of beer, ſee MALT-LIQUOR.

In new England they make beer from maize, or even the bread made thereof. Some phyſicians recommend beer made of oats and birch-water, as preferable, in nephritic

cases, to that made of barley. Phil. Transf. N° 97. p. 6135. N° 138.

Mr. Park, in the account of his travels through Africa, informs us, that the negroes make excellent beer of one species of their corn, by malting the seeds nearly in the same manner as barley is malted in England; and he says, that the beer, thus made, was to his taste equal to the best strong beer he had ever tasted in his native country.

Sour or decayed beer may be restored divers ways; as by salt made of the ashes of barley-straw, put into the vessel, and stirred; or by three or four handfuls of beech-ashes thrown into the vessel, and stirred; or, where the liquor is not very sour, by a little put into a bag, without stirring; chalk calcined, oyster-shells, egg-shells burnt, sea-shells, crabs eyes, alkalized coral, &c. do the same, as they imbibe the acidity, and unite with it into a sweetness. Beer, it is said, may be kept from turning sour in summer by hanging into the vessel a bag containing a new-laid egg, pricked full of little pin-holes, some laurel-berries, and a few barley-grains; or by a new-laid egg and walnut-tree leaves. Laurel berries alone, their skin being peeled off, will keep beer from deadness; and the throwing fixed air into it will restore it. Glauber commends his sal mirabile and fixed nitre, put into a linen bag, and hung on the top of the cask, so as to reach the liquor, not only for recovering sour beer, but for preserving and strengthening it. See Ale.

Beer tasting of the cask, may be freed from it, by putting a handful of wheat in a bag, and hanging it to the vessel. The grounds of beer form a very rich manure.

Beer *Posset*. See Zythogala.

Beer, *Eager*, is used by calico-printers, chemists, lapidaries, scarlet-dyers, vinegar merchants, white-lead-men, &c.

Beer-*Measure*. See Measure.

Beer-*Vinegar*. See Vinegar.

Beer-*Haven*, in *Geography*. See Bear-Haven.

BEERING, Behring, or Bering, Vitus, in *Biography*, an eminent navigator, was a native of Denmark, and born towards the conclusion of the 17th century. After having made two voyages to India, he entered in 1704, as a lieutenant in the Russian navy, in which he afterwards rose to the rank of captain and commodore. In pursuance of a plan conceived by Peter I., and communicated on his death-bed to Beering, for making discoveries in that tempestuous sea which lies between Kamtschatka and America, this adventurous navigator set sail in 1728, accompanied by Tscherikof, from the mouth of the Kamtschatka river, with a view of ascertaining whether the two continents of Asia and America were separated, according to the instructions prepared by Peter I. on his death-bed for this purpose. Coasting along the eastern shore of Siberia, he arrived at the latitude of 67° 18′, but made no discovery of the opposite continent. In 1729, soon after his return, he sailed again in prosecution of the same design, but without success. A third expedition was planned in 1741, and the conduct of it was entrusted with Beering and Tscherikof, who encountered many disasters, and paved the way to all the important discoveries afterwards made by the Russians. Two vessels, named the St. Peter, and St. Paul, were destined for this enterprise: the former was commanded by capt. Beering, and had on board 76 persons, including officers, and the latter by capt. Tscherikof, accompanied by Delile, professor of astronomy, and the same number of mariners. From the bay of Awatscha, which they left on the 4th of June, they proceeded northwards; and the vessels parted in a storm, and never more saw one another during the voyage. Beering steered in a southern direction from the 50th to the 46th degree of latitude in search of Tscherikof, but finding the search to be fruitless he directed his course eastwards, and at the end of six weeks from the time of first sailing, descried land in the latitude of 59° and some minutes, and in the longitude of 40° from Awatscha. On the 20th of July they anchored among some islands, on one of which they landed; but they neglected to accomplish the main object of their mission, which was the discovery of the American coast, which afterwards appeared to be so near their present station. This, however, seems to have been owing to the discontent and insubordination that prevailed among the crew and officers of the ship. Having observed several islands in the course of their voyage, they at length, viz. on the 5th of November, found themselves, as they apprehended, on the coast of Kamtschatka, near the bay of Awatscha; but the land which they perceived proved to be an island, on which the ship was wrecked, and where the commander, and several of the crew, died soon after their landing, of the scurvy, famine, and fatigue. Steller, who accompanied Beering, and wrote a journal of the voyage, observes, in justice to the commodore, that he exerted himself to the utmost of his ability in executing the design of his mission, but that he was himself conscious of his unfitness for the arduous task on account of his age and irresolution. His temper was too mild for the government of a disorderly crew: and his deference to his officers led them to presume on their own importance, and to despise his authority. Worn out at last with hunger, thirst, cold, weakness, and anxiety, the oedematous tumours in his feet, from which he had long suffered, increased by the severity of the weather, and a mortification of the belly taking place, he breathed his last on the 8th of December, and was buried between his adjutant commissary and two grenadiers. "On our departure from the island," says Steller, "we erected over the grave a wooden cross to serve as a monument, and at the same time to be a testimony of our having taken possession of the country." Steller alleges several arguments to prove that Beering discovered the continent of America, at cape St. Elias, lying, according to his estimation, in N. lat. 58° 28′, and in longitude from Ferro 236°; and that the coast touched at by Tscherikof was situated in lat. 56°. long. 241°. The coasts, says Steller, were bold, projecting chains of high mountains, some of which were covered with snow, and their sides clothed from the bottom to the top with large tracts of thick and fine wood. Steller went on shore and observed several species of birds not known in Siberia, and one in particular, described by Catesby under the name of the blue jay, peculiar to North America. The soil was different from that of Kamtschatka, and of the neighbouring islands, and he found several plants which botanists deem peculiar to America. Besides, it has been alleged that they must at least have approached very near that continent; as the natives of the islands on which they touched, presented to them the "calumet" or pipe of peace, which is a symbol of friendship universal among the people of North America, and an usage of arbitrary institution peculiar to them. Soon after the return of Beering's crew from the island, where he was shipwrecked and died, the inhabitants of Kamtschatka ventured over to that island, to which the sea-otters and other sea-animals were accustomed to resort in great numbers. Steller's Journal apud Pallas. Coxe's Russian Discoveries, p. 20. p. 277, &c. Tooke's View of the Russian Empire, vol. i. p. 156. vol. iii. p. 40. p. 499. See Asia, and the following articles, Beering's *basin*, &c.

Beering's *Basin*, in *Geography*, a name given in honour of commodore Beering, to that part of the North Pacific Ocean, compre-

comprehending about 1200 leagues in circuit, which is formed by the Archipelago, called the Aleutian or Aleoutikie islands, with the north-west coast of America, and the north-east coast of Asia, and which communicates towards the south with the great Boreal ocean by as many straits as the islands form channels between them, and towards the north, under the 66th parallel, with the Arctic Frozen ocean, by Beering's Straits alone. See ALEUTIAN.

BEERING'S, or BEHRING'S *Bay*, a bay on the north-west coast of America, situated between cape Suckling and cape Fair-weather, and so called in honour of commodore Beering, who, in 1741, discovered this bay, and anchored in it. The extreme points of this bay, in Vancouver's chart, are port Manby and port Turner; cape Phipps lies to the south of it, and port Mulgrave, formed by islands, and affording a convenient anchoring place secure from all winds, is situated within the bay. In this part of the bay, Beering is supposed to have anchored. Beering's mount, St. Elias, lies at a small distance to the north of this bay. Mr. Dixon called it Admiralty bay. La Perouse describes it under the denomination of Behring's river. According to captain Cook, the opening of this bay was in N. lat. 59° 18′; and la Perouse makes it 59° 20′. Cook's longitude was 220° 19′ E. or 139° 41′ W. 142° 1′ W. from the meridian of Paris. La Perouse fixes his longitude at 142° 2′, making only a difference of 1′ from that of Cook. Vancouver, who reconnoitred this coast more accurately than capt. Cook had an opportunity of doing, as he passed it at some distance from the shore, places it further to the north and west, its opening being about 59° 32′, and E. long. 220° 35′.

BEERING'*s Island*, an island in the north Pacific ocean on the north-east of Kamtschatka, which some have considered as one of the groups, called the Aleutian isles, (see ALEUTIAN) and others have separated from it. This island was discovered by Beering in 1741. This adventurous navigator, having been for some time in a state of indisposition and decay, was unable to concern himself about the management of his ship, and his crew were generally attacked by the scurvy, and in a sickly, enfeebled condition. Pursuing their navigation, they were at length driven by the winds and seas on this island, with the position of which, with regard to the two continents, they were unacquainted, and here the ship was cast away. On the 8th of December, Beering died on this island, which has very properly assumed the name of the first navigator who ventured into these seas, and who discovered the west continent of America, in a latitude which, before him, no known voyager had attained. In the following year, the surviving crew contrived, with great trouble, to construct a boat, which conveyed them to Kamtschatka. This island is situated between the north latitude of 55° and 56°, and E. long. 167° 20′, about 50 leagues from the coast of Kamtschatka. It is 165 versts in length, and of various breadths, the greatest breadth being 23 versts; and it consists of a range of bold cliffs and hills, which, separated by several very narrow valleys, lying north and south, seem to rise from the sea like a single rock. The highest of these mountains are elevated perpendicularly, not above a thousand fathoms, covered with a yellow clay, and much riven by storms and weather. The mountains consist of granite, those rows excepted that stand nearest the sea, which are commonly of land-stone, and form, not unfrequently, stone walls, that are very steep. In these mountains there are many caverns. In the year 1741, three smart shocks of earthquakes were perceived in this island; the sea about it is not covered with ice, and the cold is in general moderate; although there are mountains on which the snow never dissolves. Neither thunder nor the aurora borealis has been observed here. The island has springs of excellent water, and beautiful cataracts. Of animals there are only ice foxes, seals, sea-bears, sea-lions, sea-cows, &c. No wood grows upon this island; but several kinds of plants are found upon it. It is uninhabited. The ships which have been accustomed to navigate these seas have frequently wintered on this island, in order to procure a stock of salted provisions from the sea-cows and other amphibious animals, that are found here in great abundance. Tooke's View of the Russian Empire, vol. i. p. 156, &c. Marchand's Voyage, vol. i. Introd. p. 33.

BEERING'*s Straits*, separate Asia from America, being bounded on the American side, by cape Prince of Wales, in N. lat. 65° 50′. E. long. 191° 50′, and on the side of Asia, by the east cape in N. lat. 66° 6′ and E. long. 190° 22′. The breadth of this strait is about 13 leagues, or near 40 miles, its depth is from 12 to 30 fathoms. It was discovered first by Beering, and afterwards by captain Cook. Beering, in his voyage of 1718, is said to have proceeded as far north as 67° 18′, and therefore must have reached a latitude more northerly by about a degree and a quarter than that of the most eastern part of the old continent. He had, therefore, entered the Frozen Ocean, and must have actually passed this strait, probably in the usual fogs of the climate, without discovering land to the east; however, our great navigator, captain Cook, gave the name of the Danish adventurer to these straits, when with his usual accuracy, he afterwards explored them. To the north of these straits the Asiatic shore leads rapidly to the westward; but the American proceeds nearly in a northern direction, till, at the distance of about 4 or 5 degrees, the continents are joined by solid and impenetrable bonds of ice. The sea from the south of these straits to the crescent of isles between Asia and America, is very shallow, and deepens from these straits till soundings are lost in the Pacific ocean, south of these isles. Between them and the straits there is said to be an increase from 12 to 54 fathoms, excepting off cape Thaddeus, where the channel is of greater depth. From this, and other circumstances, it has been thought not improbable that a separation of the continents may have taken place in some unknown period, at these straits, and that the whole space from the isles to that small opening might once have been dry land; and that the fury of the watery element, actuated by that of fire, might have subverted and overwhelmed the tract, and left the islands as volcanic remains of this great eruption. The famous Japanese map places some islands apparently within these straits, denominated "Ya Zue," or the kingdom of the dwarfs. Hence it has been imagined, that America was not unknown to the Japanese, and that they had, as Kæmpfer and Charlevoix have suggested, made voyages of discovery; and according to the last writer, that they had actually wintered upon the continent, where probably meeting with the Esquimaux, they might, in comparison with themselves, justly distinguish them by the name of dwarfs. See ASIA.

BEERO, a Moorish kingdom of Africa, lying to the north of Bambara, and north-west of a Foulah state, called Massina. Its capital is Walet, situate, according to Mr. Park's information, about 240 geographical miles to the east of Benowm. In Rennel's map of North Africa, Walet is in N. lat. 15° 45′, and W. long. 2° 45′. The kingdom of Beero borders on Sahara, or the Great Desert.

BEEROTH, in *Ancient Geography*, a city of the Gibeonites, afterwards of the tribe of Benjamin, Josh. ix. 17. According to Eusebius, it was distant 7 miles from Jerusalem, in the way towards Nicopolis.

BEEROTH, of the children of Jaakan, was a station of the

Israelites (Deut. x. 6.), placed by Eusebius 10 miles from the city of Petra.

BEER-SHEBA, called also Bersabe and Barsheba, a city given by Joshua to the tribe of Judah, and afterwards transferred to Simeon. Josh. xv. 28. It derived its name from באר-שבע *beer-sheba*, the well of an oath, from the well on which Abraham and Isaac ratified their alliance by an oath with Abimelech. It was distant south from Hebron 20 miles, and had a Roman garrison in the time of Eusebius and Jerom. The limits of the Holy Land are often expressed in Scripture by the terms "from Dan to Beer-sheba" (2 Sam. xvii. 11. &c.); Dan being the northern and Beer-sheba the southern extremities of the land. It is now a poor village, adjoining a large, sandy, barren desart, altogether uninhabited, except towards the sea-coast.

BEES, in *Naval Architecture*, denote pieces of elm-plank bolted to the outer ends of bowsprits.

BEESENSTADT, in *Geography*, a town of Germany, in the circle of Upper Saxony, and county of Mansfield, 6 miles east of Eisleben.

BEES-HEAD, St. a cape of England, in the western extremity of the county of Cumberland, in the Irish sea, about 10 leagues E. by N. from the Isle of Man, and 2 S. of Whitehaven. It has a light-house, and is a noted promontory for sea-fowl. N. lat. 54° 31′. W. long. 30° 43′.

BEESHEN, a town in Germany, in the circle of Westphalia, and county of Lingen.

BEESKOW, a town of Germany, in the circle of Upper Saxony and Uckermark of Brandenburgh, and capital of a lordship, to which it gives name, seated on the Spree; 16 miles S. W. of Frankfort on the Oder, and 34 E. S. E. of Berlin. A cloth manufacture is carried on in this town.

BEES-WAX. See Wax.

BEESTINGS, or Breastings, denote the finest milk taken from a cow after calving.

The beestings are of a thick consistence and yellow colour, seemingly impregnated with sulphur. Dr. Morgan imagines them peculiarly fitted and intended by nature to cleanse the young animal from the recrements gathered in its stomach and intestines during its long habitation *in utero*. The like quality and virtues he supposes in women's first milk after delivery; and hence infers the necessity of the mother's suckling her own child, rather than committing it to a nurse, whose first milk is gone.

BEET, in *Botany*. See Beta.

Beet, *hare's*, *beta leporina*, a name given by some of the old Latin writers to a small green plant of an acrid taste.

Beet-*gall-insect*. See Gall-*insect*.

BEETLE, in *Entomology*, a common English name for all insects that are furnished with shelly-wing-cases: those which have them divided by a straight suture are properly beetles, and belong to the coleoptera order; but the blattæ, or cock-roaches, are also called beetles, though the suture is oblique, or in other words one wing-case crosses the other; and therefore it belongs to the hemiptera order. See Coleoptera. The scarabæi are beetles in the strictest sense of the word.

Beetles, *water*, is likewise a common name for most insects that have wing-cases that inhabit the water including the dytisci, and some other aquatic insects, that are truly beetles, with such as are not of the same order, such as the nepæ, notonectæ, &c. See Hemiptera.

Beetle, in a *Mechanical Sense*, denotes a large wooden instrument, formed after the manner of the mallet, having each face bound with a strong iron hoop, to keep it from spreading, and used for driving piles, stakes, palisades, wedges, and the like.

In this sense, the word is corruptly written in some places *boytle*. Skinner derives it from the English *beating*. For the military use, beetles called also stampers, are thick round pieces of wood, a foot and a half long, and eight or ten inches in diameter, having a handle of about four feet long. Their use is for beating or settling the earth of a parapet, or about palisades; which is done by lifting up the beetle a foot or two, and letting it fall with its own weight. The name beetle is also given to the paviour's rammer, or instrument wherewith the stones are beaten down, and fastened.

BEEVES, a general name for oxen.

BEFARIA, in *Botany*. See Bejaria.

BEFORT, in *Geography*, a town of France, and principal place of a district, in the department of the Upper Rhine, ceded to France by the house of Austria in the year 1648, at the treaty of Westphalia. It was fortified by Vauban. In this town several forges are employed in the manufacture of iron. The place contains 4,400, and the canton 11,439 inhabitants; the country includes 152½ kiliometres and 32 communes. N. lat. 47° 9′. E. long. 6° 46′.

BEFROI, Grand Befroi, and Petit Befroi, in *Ornithology*, the names of the two species of Turdus, called *tinniens* and *lineatus* by Gmelin, in Buffon's Hist. Birds.

BEG, or Bey, in the *Turkish Government*. See Bey.

Beg, *Lough*, in *Geography*, or the Little Lough, in the province of Ulster, Ireland, a small lake into which the waters from Lough Neagh again expand, after a course of about a mile, through a very narrow channel. The form of Lough-beg, its islands, some wooded points of land with intervening lawns and rocks, a magnificent rotunda at Ballyscullen, and the beautiful lightness of Toome-bridge, produce the most happy effect. It is situated between the counties of Armagh and Londonderry.

BEGA, or Begeyn, Cornelius, in *Biography*, a painter and engraver, was born at Haerlem in 1620, and became the disciple of Adrian Ostade, whose manner he imitated, and by whose instructions he profited, so as to acquire considerable reputation as a painter. But contracting habits of dissipation and licentiousness, he was disowned by his father, and resenting the indignity, he assumed the name of Bega instead of Begeyn, which was that of his family. He had a fine pencil, and a delicate mode of handling his colours, so as to give them a neat and transparent appearance; and his performances are so much esteemed in the Low Countries, as to be placed among the works of the best artists. He also etched several drolleries, and a set of 34 prints, representing ale-house scenes, &c. His death, which happened in 1664, was occasioned by the plague, which he caught from a favourite female, to whom he was so strongly attached that he visited her, against the remonstrances of his friends and physicians, to the last moments of her life; and he outlived her only a few days. Pilkington and Strutt.

Bega, or *Vega*, in *Geography*, a river in Germany, which runs into the Werra, 4 miles N. W. of Lemgo, in the circle of Westphalia.

BEGANNA, in *Ancient Geography*, a town of Arabia Deserta, in the neighbourhood of Mesopotamia. Ptolemy.

BEGARD, in *Geography*, a town of France, in the department of the Northern coasts, and chief place of a canton in the district of Guingamp; the place contains 2394 and the canton 7864 inhabitants: the territory includes 102½ kiliometres, and 7 communes.

BEGARMEE, or Baghermi, supposed to be the "Begama" of Edrisi, and the "Gorham" of D'Anville, an extensive kingdom of Africa, situate S. E. of Bornou, at the distance of about 20 days' travelling, or allowing, with major Rennell, 15 miles for a day's journey, 300 miles, and separated from it by several small deserts. The extent, according to Browne's Travels in Africa, p. 468, is from

from E. to W. 12 days, and from N. to S. 15 days, allowing 12½ geographical miles per day. The inhabitants are rigid Mahometans, and though perfectly black in their complexions are not of the Negro caſt. Beyond this kingdom to the eaſt, (ſee Proceedings of the Aſſociation for promoting the diſcovery of the Interior Parts of Africa, p. 155.) are ſeveral tribes of Negroes, idolaters in ther religion, ſavage in their manners, and accuſtomed, it is ſaid, to feed on human fleſh. They are called the Kardee, the Serrowah, the Showvah, the Battah, and the Mulgui. Theſe nations, the Begarmeeſe, who fight on horſeback, and are great warriors, annually invade; and when they have taken as many priſoners as opportunity affords, or their purpoſe may require, they drive the captives like cattle to Bergarmee. It is ſaid, that if any of them, weakened by age, or exhauſted by fatigue, happen to linger in their pace, one of the horſemen ſeizes on the oldeſt, and cutting off his arm, uſes it as a club to drive on the reſt. From Begarmee they are ſent to Bornou, where they are ſold at a low price; and from thence many of them are conveyed to Fezzan, where they generally embrace the Muſſulman faith, and are afterwards exported by the way of Tripoli to different parts of the Levant. Begarmee, the capital of the kingdom, lies in N. lat. 15°. E. long. 26° 30'; according to Rennell's Map; but according to Browne, N. lat. 16° 40'. E. long. 22° 25'.

BEGARRA, a town of Spain in New Caſtile, 4 leagues from Alcarez.

BEGEMDER, a province of Abyſſinia, north-eaſt of Tigré, bordering upon Angot, and ſeparated from Amhara, which runs parallel to it on the ſouth, by the river Baſhilo. Both theſe provinces are bounded by the river Nile on the weſt. The greateſt length of Begemder is about 180 miles, and its breadth 60; and it comprehends "Laſta," a mountainous province, ſometimes depending upon Begemder, and often in rebellion. The inhabitants are eſteemed the beſt ſoldiers in Abyſſinia, being men of great ſtrength and ſtature, but cruel and uncivilized; ſo that they are called, in common converſation and writing, the peaſants or barbarians of Laſta. They pay to the king 1000 ounces of gold.

Several ſmall provinces are now diſmembered from Begemder, ſuch as Foggora, a ſmall ſtripe of land reaching ſouth and north about 35 miles between Emfras and Dara, and about 12 miles broad from eaſt to weſt, from the mountains of Begemder to the lake Tzana. On the north end of this are two ſmall governments, Dreeda and Karoota, the only territory in Abyſſinia that produces wine; the merchants trade to Caſſa and Narea, in the country of the Galla.

Begemder is the ſtrength of Abyſſinia in horſemen. It is ſaid that, with Laſta, it can bring out 45,000 men; but this account Bruce thinks to be much exaggerated. It is well ſtocked with cattle of every kind, that are very beautiful. The mountains are full of iron mines; they are not ſo ſteep and rocky as in other provinces, if we except Laſta, and abound in all ſorts of wild fowl and game. The ſouth end of the province near Nefas Muſa is cut into prodigious gullies, apparently by floods, of which no hiſtory remains. It is the [illegible]t barrier againſt the enchroachments of the Galla, who [illegible]ve made many attempts to obtain a ſettlement here, but without ſucceſs; and they have loſt whole tribes in theſe ineffectual efforts. Begemder is a province of ſuch conſequence to the ſtate, reaching ſo near the metropolis, and re- [illegible] but noblemen of rank, family, and character, able to maintain a large number of troops always on foot, and in good order, are truſted with its government. It lies in about N. lat. 11° 45', and from 37° 30' to 38° 30' E. long.

BEGER, Laurence, in *Biography*, a German antiquarian, was the ſon of a tanner at Heidelberg, and born in 1653. At the requeſt of his father he firſt ſtudied theology, and afterwards gratified his own inclination by the ſtudy of the law. Devoting himſelf to claſſical literature and antiquities, he acquired ſuch reputation that, in 1677, he was appointed librarian and keeper of the cabinet of antiquities by Charles Lewis, elector Palatine; and he retained the ſame office under Frederick William, elector of Brandenburg, to whom the cabinet was transferred in 1685. He was a member of the Society of Berlin from its inſtitution, and died there in 1705. He was the author of various learned works. His "Conſiderations on Marriage, by Daphnæus Arcuarius," was written in German, as a defence of polygamy, to gratify the elector Palatine, who wiſhed to marry another lady, to whom he was attached, whilſt his wife was living. He afterwards gratified the ſon by compoſing a refutation of this work, which was never printed. The principal of his other works, which relate to hiſtory and antiquities, are "Theſaurus ex Theſauro Palatino Selectus," 1685, fol.; "Theſaurus Reg. elect. Brandenburgius Selectus," 3 vols. fol.; "Regum et Imperator. Roman. Numiſmata," 1700, fol.; "De Nummis Cretenſium ſerpentiferis," 1702, fol.; "Lucernæ Veterum ſepulchrales," 1702; "Numiſmata Pontif. Roman. aliorumque rariora," 1703, fol.; "Meleagrides et Ætolia," 1696, 4to.; "Cranæ inſula Laconica," 1696, 4to.; "Bellum et Excidium, Trojanum illuſt." 1699, 4to.; Moreri.

Laurentius Beger, the nephew of this famous antiquarian, was an engraver of ſome eminence at Berlin about the year 1700.

Beger, in *Geography*, a town of Spain, in the country of Seville, 14 leagues from Medina Sidonia.

BEGGA, in *Entomology*, a ſpecies of *Phalæna*, (Bombyx) with white wings, having a black rib. This kind inhabits Surinam. The body is white; antennæ and legs yellow, black at the tips. Fabricius, Gmelin, &c.

BEGGAR. Beggars pretending to be blind, lame, &c. found begging in the ſtreets, are to be removed by the conſtables; and refuſing to be removed, ſhall be whipped, &c. ſtat. 12 Anne; and our ſtatutes have been formerly ſo ſtrict for puniſhing of beggars, that in the reign of king Henry VIII. a law was enacted, that ſturdy beggars convicted of a ſecond offence ſhould be executed as felons. But this ſtatute was afterwards repealed. See Rogue and Vagabond.

BEGGING Order. See Mendicant.

BEGHARDI, Beguardi, or Begghardi, in *Eccleſiaſtical Hiſtory*, called alſo in Italy *bizochi*, and in France *beguins*, derive their name from the old German word *beggen*, *beggeren*, which ſignifies "to ſeek any thing with zeal and importunity." Accordingly perſons of this deſcription were called Beghardi, whence probably the Engliſh word *beggar* is derived; and Beguttæ denoted female beggars. This was a general appellation, and given to no leſs than thirty ſects or orders, that ſprung up in the thirteenth century, which differed widely from each other in their opinions, their diſcipline, and manner of living. It was at firſt indiſcriminately applied to all perſons who embraced, with reſignation and free choice, the horrors of abſolute poverty; begging their daily bread from door to door, and renouncing all their worldly poſſeſſions and occupations. It was afterwards reſtricted to thoſe who diſtinguiſhed themſelves by an extraordinary appearance of devotion, and was uſed much in the ſame ſenſe with the term *Methodiſt* among us. Theſe perſons formed a ſort of intermediate order between the monks and citizens, reſembling the former in their manner of living, without aſſuming their name, or contracting their obligations. They were divided into two claſſes, which derived their different denominations of *perfect* and *imperfect* from the different degrees of auſterity that they diſcovered in their manner of living. The *perfect* lived upon alms, abſtained from wedlock, and had no fixed habitations. The *imperfect* conformed to the cuſtoms of the reſt of their fellow-citizens

in these respects. The name was at first honourable, but by degrees it sunk into reproach, being adopted by many, who, under the mask of religion, concealed the most abominable principles, and committed the most enormous crimes.

The Beghards of Germany, deprived of the protection of the emperor Lewis, suffered extreme misery under Charles IV. who was advanced, by the interest of the pope, to the imperial throne in 1345. Desirous of gratifying the desires of the court of Rome, he supported by his edicts and by his arms the papal inquisitors, and allowed them to apprehend and put to death all those that were deemed enemies; and among others the Beghards were victims to their persecuting power. The emperor himself, who resided at Lucca in Italy, not only approved these violent measures, but issued out in 1369 severe edicts, commanding all the German princes to extirpate out of their dominions the Beghards and Beguines, or, as he himself interpreted the name, "the voluntary beggars," as enemies of the church and of the Roman empire, and to assist the inquisitors in their proceedings against them. By another edict, published not long after, he gave the houses of the Beghards to the tribunal of the inquisition, ordering them to be converted into prisons for heretics; and at the same time ordered all the effects of the Beguines to be publicly sold, and the profits arising from them to be equally divided between the inquisitors, the magistrates, and the poor of those towns and cities where such sale should be made. The Beghards, being reduced to great straits by this and other mandates of the emperor, and by the constitutions of the popes, sought a refuge in those provinces of Swisserland that border upon the Rhine, and also in Holland, Brabant, and Pomerania. But the edicts and mandates of the emperor, together with the papal bulls and inquisitors, followed them wherever they went, and distressed them in their most distant retreats, so that, during the reign of Charles IV., the greatest part of Germany (Swisserland, and those provinces that are contiguous to it, excepted) was thoroughly purged of the Beghards, or rebellious Franciscans, both perfect and imperfect.

The Beghards of Flanders are a denomination by which certain unmarried persons, both bachelors and widowers, are distinguished, who formed themselves into communities of the same kind with those of the female *Beguines*, reserving to themselves the liberty of returning to their former method of life. The first society of those Beghards was established at Antwerp in the year 1228, and continues still; though the brethren of which it is composed have long since departed from their primitive rule of discipline and manners. This first establishment was succeeded by many others in Germany, France, Holland, and Flanders. These fraternities long enjoyed the toleration of the Roman pontiffs; but most of the convents are now either demolished or converted to other uses. See BRETHREN *of the Free Spirit*, FRATRICELLI, and TERTIARIES. Mosheim's Eccl. Hist. vol. iii. p. 86. 8vo. 1758.

BEGIA, in *Geography*. See BAYJAH.

BEGIS, in *Ancient Geography*, a town of Illyria, which belonged to the Trallians. Steph. Byz.

BEGKAWE, in *Geography*, a town of Bohemia, in the circle of Breslaw; 3 miles west of Melnik.

BEGLAISEH, a town of Asiatic Turkey, in the province of Caramania, 8 miles north of Kirshehr.

BEGLERBEG, a Turkish title for the chief governor of a province, who has under him several *beys* or *sangiacs*, that is, subgovernors. The word is also written "beylerbey," "beglerbey," "beghelerbeghi," and "beylerbeg." It is compounded of "begler," lords; the plural of "beg," lord, with the word "beg," subjoined; importing as much as *lord of lords*.

The next to the visier *azem*, or the first visier, are the beglerbegs in Turkey, who, according to Rycaut, may be compared to archdukes in some other countries, being the next ministers below the prime vizier, and having under their jurisdiction many sangiacs, or provinces, and their begs, agas, &c. To every beglerbeg the grand signior gives three ensigns or staves, trimmed with a horse-tail, to distinguish them from the bashaws, who have but two, and from simple begs, or sangiac-begs, who have but one. See BASHAW.

The province or government of a beglerbeg is called "beglerbeglik," or "beglierbeglik." These are of two sorts; the first is called "basile beglerbeglik," which has a certain rent assigned out of the cities, countries, and seignories allotted to the principality; the second called "salianæ beglerbeglik," for maintenance of which is annexed a certain salary or rent, collected by the grand signior's officers with the treasure of the empire. The beglerbegs of the first sort are in number twenty-two, viz. those of Anatolia, Caramania, Diarbekir, Damascus, Aleppo, Tripoli, Trebizond, Buda, Temeswar, &c. The beglerbegs of the second sort are in number six, viz. those of Cairo, Babylon, &c. Five of the beglerbegs have the titles of visiers, viz. those of Anatolia, Babylon, Cairo, Romania, and Buda. The beglerbegs appear with great state, and a large retinue, especially in the camp, being obliged to bring a soldier for every five thousand aspers rent which they enjoy.

The beglerbegs of Romania brought ten thousand effective men into the field.

BEGLERBEG is also a title given to the chief governors of provinces in the Persian empire, having the command over all khans, sultans, &c. in their respective districts.

BEGON, MICHAEL, in *Biography*, was born of a good family at Blois, in 1638. After having occupied some law offices in his native province, he was introduced by his kinsman, the marquis de Seignelai, into the marine department, and became successively intendant of Havre, of the French colonies in America, and of the gallies. In 1688, he removed to Rochefort, and possessed the intendance of that post till his death, which happened in 1710. His leisure hours were assiduously devoted to the cultivation of literature, and he was owner of a valuable library, which was free of public access. In most of his books was written "Michaelis Begon et amicorum," i. e. the property of Begon and his friends; and when he was once cautioned by his librarian against lending his books for fear of losing them, he replied, "I would rather lose them, than seem to distrust any honest man." His cabinet was richly stored with medals, antiques, prints, and various curiosities, collected from all parts of the world. Having procured engravings of several eminent Frenchmen of the seventeenth century, he collected memoirs of their lives, which furnished materials for Perrault's "Hommes Illustres." Of his botanical researches in the American colonies father Plumier availed himself in his publication. Nouv. Dict. Hist.

BEGONIA, so named by Plumier after Mons. Begon. in *Botany*. Lin. gen. n. 1156. Schreb. 1442. Dryander in Linn. Trans. 1. 158. Gærtn. fruct. t. 31. Juss. gen. 436. Class and order, *monoecia polyandria*. Nat. Ord. *holoraceæ. Incertæ*, Juss. Gen. Char. * Male flowers. *Cal.* none. *Cor.* petals four (in B. *octopetala* six to nine), of which two opposite ones are larger, commonly roundish (in B. *ferruginea* all nearly equal, oblong.) *Stam.* filaments numerous (15 to 190), inserted into the receptacle, very short, sometimes united at the base; anthers oblong, erect. * Female flowers. *Cal.* none. *Cor.* petals in most species five, in some six, in others perhaps four, commonly unequal. *Pist.* germ inferior, three-sided, in very many winged; styles in most three, bifid; stigmas six. *Per.* capsule in most three-cornered, winged, three-celled, opening at the base by the wings; some are two-celled, and others perhaps one-celled.

Essent. Char. Male. *Cal.* none. *Cor.* many-petalled. *Stam.* numerous. Female. *Cal.* none. *Cor.* many-petalled, superior. *Caps.* winged, many-seeded.

Species, 1. B. *nitida*. Dryand. in Lin. Trans. 1. 159. Ait. Hort. Kew. 3. 352. B. obliqua, L'Herit. Stirp. Nov. 1. 95. t. 46. B. minor, Jacq. Collect. 1. 128. n. 3. B. purpurea, Swartz. prodr. 86. "Shrubby, erect; leaves very smooth, unequally cordate, obscurely toothed; largest wing of the capsule roundish." This elegant shrub, which is now a common ornament to our hot-houses, was introduced here in 1777 by William Brown, M. D. A native of Jamaica; flowering here from May to December. 2. B. *isopteria*. Dryand. ubi supra. Smith ic. ined. 2. t. 43. "Caulescent; leaves smooth, semicordate, obscurely toothed; wings of the capsule almost equal, parallel." A native of Java, where it was observed by Thouin. 3. B. *reniformis*. Dryand. "Caulescent; leaves kidney-shaped, angular, toothed; the largest wing of the capsule acute-angled, the others parallel, very small." A native of Brasil, near Rio de Janeiro, in shady clefts of rocks; observed there by sir Joseph Banks. 4. B. *erminia*. Dryander. L'Herit. Stirp. Nov. 1. 97. t. 47. "Caulescent; leaves cordate, acuminate, serrate, the largest wing of the capsule sickle-shaped, the rest obliterated." A native of Madagascar, on stones and rocks by brooks, collected there by J. G. Bruguiere, M.D. who considers the appendices to the leaves, resembling the galls on lime-tree leaves, or the tails in ermine, as belonging to the leaves themselves, and not occasioned by punctures of insects. 5. B. *crenata*. Dryander. "Caulescent; leaves unequally cordate, roundish, obtuse, crenate-toothed; capsules two-celled. A native of the East Indies, in the island Salsette, and near fort Victory, on walls and rocks. Found there by Ant. Pantaleon Hove. 6. B. *tenuifolia*. Dryander. "Caulescent; leaves unequally cordate, ovate, acute-angular, obscurely toothed; capsules two-celled." A native of Pulo Pontangh, or Prince's Island, near Java. Found there by sir Joseph Banks. 7. B. *ferruginea*. Dryander. Smith. Linn. Supp. 419. Lamarck Encycl. 1. 395. n. 9. Jacq. Coll. 1. 128. n. 1. "Caulescent; leaves unequally cordate, toothed; petals of the male flower oblong, nearly equal." Distinguished from the other species hitherto known by the long and narrow petals of the male flowers, all of the same breadth, and very little differing in length. Gathered in New Canada by Mutis. 8. B. *grandis*. Dryander. B. obliqua. Thunb. Jap. 231. Kæmpf. ic. select. t. 20. Sjukaido. Kæmpf. Amœn. 888. "Caulescent; leaves unequally cordate, angular, serrate; wings of the capsule a little unequal." This and the next species have by far the largest leaves of any in the genus; but in this the flowers are twice as large as in *macrophylla*. A native of Japan. 9. B. *macrophylla*. Dryander. Lamarck Encycl. 1. 394. n. 6. B. grandifolia. Jacq. Collect. 1. 128. n. 2. B. purpurea et nivea maxima, folio aurito. Plum. ic. 34. t. 45. f. 1. "Two feet high, entirely smooth; female flowers five-petalled." A native of the islands in the West Indies. 10. B. *acutifolia*. Dryander. Jacq. Collect. 1. 128. n. 4. Sloan. Jam. t. 127. f. 1, 2. "Caulescent; leaves semicordate, angular, toothed; the largest wing of the capsule obtuse-angled, the others acute-angled." A native of Jamaica, observed there by sir H. Sloane, and since by Masson. 11. B. *acuminata*. Dryander. "Caulescent; leaves hispid, semicordate, acuminate, unequally toothed; the largest wing of the capsule obtuse-angled, the others acute-angled." A native of Jamaica, on the Blue Mountains; introduced into Kew garden in 1790. 12. B. *humilis*. Dryander. Ait. Hort. Kew. "Caulescent, upright; leaves hispid, semicordate, doubly serrate; wings of the capsule roundish, a little unequal." A native of the island of Trinidad in the East Indies; found there by Alex. Anderson. Supposed, on its first introduction to Mr. Lee's garden at Hammersmith, in 1788, to be annual; it was then very low, and was called *humilis*; but it has since stood over the winter, and grown much taller. 13. B. *hirsuta*. Dryander. Aubl. Guian. 913. t. 348. Lamarck. Encycl. 1. 393. n. 3. Jacq. Collect. 1. 129. n. 8. "Caulescent; leaves hispid, semicordate, doubly serrate; the largest wing of the capsule obtuse-angled, the others parallel and very small." Observed by M. F. Aublet, on the rocks of Guiana. 14. B. *urticæ*. Dryander. Linn. Supp. 420. Lamarck Encycl. 1. 394. n. 8. Jacq. Collect. 1. 129. n. 7. B. urticæfolia. Smith. ic. ined. 2. t. 45. "Caulescent, radicant; leaves hispid on both sides, unequally ovate, doubly serrate; capsules three-horned at the base." Gathered by Mutis in New Granada. 15. B. *scandens*. Dryander. Swartz. Prodr. 86. B. glabra. Aubl. Guian. 916. Lamarck. Encycl. 1. 394. n. 4. Jacq. Collect. 1. 129. n. 5. "Scandent; radicant; leaves ovate-roundish, obscurely toothed; the largest wing of the capsule obtuse-angled, the others parallel and very small." Perennial: a native of Guiana, the isle of France, and Jamaica. 16. B. *tuberosa*. Dryander. Lamarck Encycl. Empetrum acetosum. Rumph. Amb. 5. 457. t. 169. f. 2. "Creeping; leaves unequally cordate, angular, toothed; wings of the capsule parallel." A native of Amboina, the Molucca islands, and Celebes. 17. B. *rotundifolia*. Dryander. Lamarck. B. obliqua Linn. Spec. 1498. B. roseo flore, folio orbiculari. Tournef. Inst. 660. Plum. Cat. Amer. 20. ic. 33. t. 45. "Creeping; leaves reniform, roundish, crenate." A native of South America, on rocks and trees; found there by Plumier. 18. B. *nana*. Dryander. L'Herit. Stirp. Nov. 1. 99. t. 48. "Stemless; leaves lanceolate; scape with about two flowers." A native of Madagascar, on rocks and trunks of trees; found by Bruguiere. 19. B. *tenera*. Dryander. Falkea tenera. Koenig. "Stemless; leaves unequally cordate; flowers umbelled." A native of Ceylon, found there by Koenig. 20. B. *diptera*. Dryander. B. capensis. Linn. Supp. 420. Jacq. Coll. 1. 130. n. 9. Linn. Mant. 502. "Stemless; leaves unequally cordate; peduncles dichotomous; one wing of the capsule very large, another narrow, and the third obscure." A native of the island of Joanna, in shady places, by the sides of mountains; found there by Koenig. 21. B. *octopetala*. Dryander. L'Herit. Stirp. Nov. 1. 101. "Stemless; leaves cordate, five-lobed; peduncles dichotomous." Found on the mountains of Lima by Dombey, who sent the seeds to the Paris garden, where it has grown some years, but not flowered. 22. B. *malabarica*. Dryander. Lamarck. Jacq. Collect. Rheed. Malab. 9. 167. t. 86. "Stems herbaceous; peduncles axillary, short, subtriflorous; fruits berried." A native of Malabar. 23. B. *repens*. Dryander. Lamarck. B. obliqua γ. Linn. Spec. 1498. Plum. Amer. 20. ic. 34. t. 45. f. 2. "Stems creeping, rooting at the joints; leaves one-eared; peduncles axillary, long, many-flowered." A native of St. Domingo. Mr. Dryander denominates the two last obscure species; and has added also some others.

The whole plant in the Begonias is fleshy; the stem in most of the species is herbaceous, but some are stemless. The leaves are petioled, in the caulescent species alternate. At the base of the petioles is a pair of stipules. The peduncles in the greater part are dichotomous; and in the caulescent species axillary. They are natives of Asia and America within the tropics. Three species have been found on the islands near the coast of Africa, but none on that continent. To Mr. Dryander botanists are principally indebted for their knowledge of this genus. Linn. Trans. vol. i. p. 159.

Propagation and Culture. These plants increase readily by cuttings; and it keeps [illegible] flowers; are highly ornamental,

mental, being much eſteemed, both for the beauty of the flowers, and the ſingularity of the leaves. Where a bark-ſtove is wanting, they will do very well over the flue of the dry ſtove. Martyn's Miller's Dict.

BEGRAS, in *Geography*, a town of Aſiatic Turkey, in Syria, at the foot of the Black Mountain, between Alexandretta and Antioch.

BEGUE, Achilles William, in *Biography*, born in the diſtrict of Orleans, was admitted doctor in medicine by the univerſity of Paris the 30th of September 1760. He is known principally by his tranſlations into French of Dr. Whytt's Treatiſe on Nervous Affections; Dr. Monroe's Obſervations on the Diſeaſes of the Army; Baron Stork's Eſſays on the virtues of hemlock, the thorn-apple, henbane, and other poiſonous vegetables; and Baron Van Swieten's account of the uſe of the corroſive ſublimate in curing the venereal diſeaſe. His original compoſitions are "Le Conſervateur de la Santé," et "Etrennes ſalutaires," both publiſhed in 12mo. in 1763; the idea of which ſeems to have been borrowed from Tiſſot's "Avis au Peuple ſur ſa Santé," of which he publiſhed an edition at Paris, 1762, in 2 vols. 12mo. Eloy. Dict. Hiſt.

BEGUINS, in *Eccleſiaſtical Hiſtory*, were, as well as the Beghards, a kind of half-monks, called Tertiaries, who attached themſelves to the genuine followers of St. Francis. In Italy they were denominated "Bizochi," and "Bocaſoti;" in France, "Beguins;" and in Germany, "Beghards," or "Beguards," which laſt was the denomination by which they were commonly known in almoſt all places. If we except their ſordid habit, and certain obſervances and maxims which they followed in conſequence of the injunctions of the famous ſaint now mentioned, they lived after the manner of other men, and were therefore conſidered in no other light than as ſeculars and laymen. See Beghards, and Tertiaries.

We muſt not confound, ſays Moſheim, theſe Beguins and Beguines, who derived their origin from an auſtere branch of the Franciſcan order, with the German and Belgic Beguines, who crept out of their obſcurity in the 13th century, and multiplied prodigiouſly in a very ſhort ſpace of time. Their origin was of an earlier date than this century; but they now acquired a name, and made a noiſe in the world. It appears from authentic and unexceptionable records, that, ſo early as the 11th and 12th centuries, there had been ſeveral ſocieties of Beguines eſtabliſhed in Holland and Flanders. However, the only convent of Beguines that exiſted before the 13th century, was that of Vilvorden, in Brabant, where they were ſettled, as appears by public acts, in the years 1065, 1129, and 1151. Their primitive eſtabliſhment was undoubtedly the reſult of virtuous diſpoſitions and upright intentions. A certain number of pious women, both virgins and widows, in order to maintain their integrity, and preſerve their principles from the contagion of a vicious and corrupt age, formed themſelves into ſocieties, each of which had a fixed place of reſidence, and was under the inſpection and government of a female head. Here they divided their time between exerciſes of devotion, and works of honeſt induſtry, reſerving to themſelves the liberty of entering into the ſtate of matrimony, as alſo of quitting the convent, whenever they thought proper. And as all thoſe among the female ſex, who make extraordinary profeſſions of piety and devotion, were diſtinguiſhed by the title of Beguines, i.e. perſons who were uncommonly "aſſiduous in prayer," as the name imports (ſee Beghards); that title was given to the women now mentioned. All the Beghards and Beguines that yet remain in Flanders and Holland, where their convents have almoſt entirely changed their primitive form, affirm unanimouſly, that both their name and inſtitution derive their origin from St. Begghe, ducheſs of Brabant, and daughter of Pepin, mayor of the palace to the king of Auſtraſia, who lived in the ſeventh century. This lady, therefore, they conſider as their patroneſs, and honour her as a kind of tutelary divinity with the deepeſt ſentiments of veneration and reſpect. Thoſe, on the other hand, who are no well wiſhers to the cauſe of the Beguines, deduce their origin from Lambert de Begue, a prieſt and native of Liege, who lived in the twelfth century, and was much eſteemed on account of his eminent piety.

The firſt ſociety of this kind, of which record remains, was formed at Nivelle in Brabant, in the year 1226; or, according to other hiſtorians, in 1207: and was followed by ſo many inſtitutions of a like nature in France, Germany, Holland, and Flanders, that, towards the middle of the thirteenth century, there was ſcarcely a city of any note that had not its "beguinage," or vineyard, as it was ſometimes called in conformity to the ſtyle of the "Song of Songs." All theſe female ſocieties were not governed by the ſame laws; but in the greateſt part of them, the hours that were not devoted to prayer, meditation, or other religious exerciſes, were employed in weaving, embroidering, and other manual labours of various kinds. The poor, ſick, and diſabled Beguines were ſupported by the pious liberality of ſuch opulent perſons as were friends to the order. In the 14th century theſe ſocieties were more numerous in various parts of Germany; but, adopting ſome of the extravagant opinions of the "Myſtic Brethren and Siſters of the Free Spirit," they ſhared with them in the perſecution which they ſuffered. The "Clementina," or conſtitution of the council of Vienne, A.D. 1311, againſt the Beguines, gave riſe to a perſecution of theſe perſons, which laſted till the reformation by Luther, and ruined the cauſe of the Beguines and Beghards in many places. From this Clementina, many took occaſion to moleſt the Beguines in their houſes, to ſeize and deſtroy their goods, to offer them many other inſults, and to involve alſo the Beghards in the like perſecution. In the year 1324, however, they obtained ſome relief by a ſpecial conſtitution of the Roman pontiff, John XXII. in which he explained the Clementina, and ordered that the goods, chattels, habitations, and ſocieties of the innocent Beguines ſhould be preſerved from every kind of violence and inſult; and this example of clemency and moderation was afterwards followed by other popes. The Beguines, on the other hand, in hopes of diſappointing the malice of their enemies, and avoiding their ſnares, embraced, in many places, the third rule of St. Francis, and of the Auguſtines. But this meaſure was unavailing; for from this time they were oppreſſed in ſeveral provinces by the magiſtrates, the clergy, and the monks, who caſt a greedy eye on their treaſures, and were extremely eager to divide the ſpoil. Moſheim's Eccl. Hiſt. vol. iii. p. 232, 377, &c.

Communities of Beguines, or Beguinages, ſtill ſubſiſt in Holland, Flanders, and Germany. In Bruſſels, there is a ſingular part of it, which is in fact a little town, incloſed by a wall and ditch, and divided into ſtreets. It is called the Beguinage. The number of Beguines is near a thouſand, governed by matrons, and under the ſpiritual direction of the biſhop of Antwerp. There are alſo Beguinages at Amſterdam, Antwerp, and Malines.

BEGZAM, in *Geography*, a town of Africa, in the country of Agadez, ſouth of Agad or Agades, the capital of the country, and at a greater diſtance ſouth of Aſouda, and weſt of the deſert of Jazr. N. lat. 19° 28′. E. long. 12° 50′.

BEHAIRAT-EL-MARDJ, or *Lake of the Meadow*, a moraſs of Syria, about 3 leagues from Damaſcus to the ſouth-eaſt, into which flow the rivulets that fertilize the gardens in the neighbourhood of the city. See Damascus.

BEHAM, Hans, or Joan Sebald, in *Biography*, an eminent

eminent engraver, flourifhed about the year 1540. Like Henry Aldegrever and Albert Durer, whofe works were the fources from which he derived his greateft improvement, he engraved in wood, and alfo on copper, and etched fome few plates. He was alfo a painter of reputation, and celebrated by the poets of that age under the name of Bohemus. He was a man of good genius, and diftinguifhed by fertility of invention. But the Gothic tafte which prevailed in Germany in his time, is too apparent in all his works. His brother Bartolomeo Beham flourifhed as an engraver about the fame time. He is faid to have ftudied under Marc Antonio Raimondi, whofe manner he imitated. His chief refidence was at Rome, where he died. Strutt.

BEHAMBERG, in *Geography*, a town of Germany, in the archduchy of Auftria, 3 miles eaft of Steyr.

BEHAMKIRCHER, a town of Germany, in the archduchy of Auftria, 6 miles fouth-eaft of St. Polten.

BEHAVIOUR, Good, in *Law*. See Good *Abearing*.

BEHBEHAN, a town of Perfia, in the province of Fars.

BEHDUROO, a country of Hindoftan, in the northern parts of Lahore, near the Imaus mountains, where one branch of the river Rauvee fprings.

BEHEADING, a capital punifhment, wherein the head is fevered from the body by the ftroke of an ax, fword, or other cutting inftrument.

Beheading was a military punifhment among the Romans, known by the name of *decollatio*. Among them the head was laid on a *cippus*, or block, placed in a pit dug for the purpofe; in the army, without the *vallum*; in the city, without the walls, at a place near the *porta decumana*. Preparatory to the ftroke, the criminal was tied to a ftake, and whipped with rods. In the early ages the blow was given with an ax; but in after-times with a fword, which was thought the more reputable manner of dying. The execution was but clumfily performed in the firft times; but afterwards they grew more expert, and took the head off clean with one circular ftroke.

In England and France, beheading is the punifhment of nobles; being reputed not to derogate from nobility, as hanging does.

Beheading is part of the punifhment of high-treafon, affecting the king's perfon or government. The king may, and often does, difcharge all the punifhment, except beheading, efpecially when any of noble blood are attainted. For, beheading being part of the judgment, that may be executed, though all the reft be omitted by the king's command.

In Scotland they do not behead with an ax, as in England; nor with a fword, as in Holland and formerly in France where they now ufe the guillotine; but with an edged inftrument called the maiden.

BEHEM, Behem, Behen, Bohem, Martin, in *Biography*, fuppofed to be the fame with Martin Behenira, to whom Garcilaffo de la Vega afcribes the firft difcovery of America, was a famous geographer and navigator of the 15th century. The chriftian name, fays M. Otto, *(ubi infra)* is the fame with that of Garcilaffo, and the fyllables "ira" he conceives, were added to his name in confequence of his receiving the honour of knighthood from John II., king of Portugal. Behem was born of a noble family, of which fome branches ftill remain at Nuremberg, an imperial city in the circle of Franconia. Addicted from his infancy to the ftudy of geography, aftronomy, and navigation, and having enjoyed the advantage of Regiomontanus's inftruction, he entertained the thought, at more mature age, of the poffibility of the exiftence of the antipodes, and of a weftern continent. Under the influence of this imagination, he paid a vifit, in 1459, to Ifabella, daughter of John I., king of Portugal, and regent of the duchy of Burgundy and Flanders; and having informed her of his defigns, he procured a veffel, in which he difcovered the ifland of Fayal in 1460. Here he eftablifhed a colony of Flemings, whofe defcendants are faid ftill to exift in the Azores, which for fome time were called the "Flemifh iflands." For the proof of this fact M. Otto refers to the records of Nuremberg, and to the teftimony of Wagenfeil, one of the moft learned men of the laft century, in his "Univerfal Hiftory and Geography." Having obtained a grant of Fayal from the regent Ifabella, and after having refided there 20 years, Behem applied, in 1484, eight years before the expedition of Columbus, to John II. king of Portugal, for the means of undertaking a great expedition towards the fouth-weft. In the profecution of this undertaking he difcovered that part of America, which is now called Brazil, and failed to the ftraits of Magellan, or to the country of fome favage tribes, whom he called Patagonians, becaufe the extremities of their bodies were covered with a fkin more like a bear's paws than human hands and feet. One of the records, preferved in the archives of Nuremberg, and containing this fact, affirms, that "Martin Behem, traverfing the Atlantic ocean for feveral years, examined the American iflands, and difcovered the ftrait, which bears the name of Magellan, before either Chriftopher Columbus or Magellan failed thofe feas; and even mathematically delineated, on a geographical chart, for the king of Lufitania, the fituation of the coaft, around every part of that famous and renowned ftrait." This affertion is fupported by Behem's own letters, written in German, and preferved in the fame archives; which letters are dated in 1486. The difcovery of Behem is alfo noticed by contemporary writers. In the chronicle of Hartman Schedl, or Herman Schedel, entitled "Chronicon Mundi," and of which a German tranflation was publifhed at Nuremberg in 1493, we have the following paffage to this purpofe: "In the year 1485, John II., king of Portugal, a man of a magnanimous fpirit, furnifhed fome gallies with provifions, and fent them to the fouthward beyond the ftraits of Gibraltar. He gave the command of his fquadron to James Canus, a Portuguefe, and Martin Behem, a German of Nuremberg in Upper Germany, defcended of the family of Bonna, a man very well acquainted with the fituation of the globe, bleffed with a conftitution able to bear the fatigues of the fea, and who, by actual experiments and long failing, had made himfelf perfectly mafter with regard to the longitudes and latitudes of Ptolemy, in the weft. Thefe two, by the bounty of Heaven, coafting along the fouthern ocean, and having croffed the equator, got into the other hemifphere, where, facing to the eaftward, their fhadows projected to the fouth and right hand. Thus, by their induftry, they may be faid to have opened to us another world hitherto unknown, and for many years attempted by none but the Genoefe, and by them in vain. Having finifhed this cruife in the fpace of 26 months, they returned to Portugal, with the lofs of many of their feamen, by the violence of the climate." This paffage was cited by the publifhers of the works of Æneas Sylvius, afterwards pope Pius II. Two years before the expedition of Columbus, Petrus Matæus, a writer on the canon law, remarks, that "the firft Chriftian voyages to the newly difcovered iflands became frequent, under the reign of Henry, fon of John king of Lufitania. After his death, Alphonfus V. profecuted the defign; and John, who fucceeded him, followed the plan of Alphonfus, by the affiftance of Martin Bœhm, a very experienced navigator; fo that, in a fhort time, the name of Lufitania became famous over the whole world." Cellarius alfo fays expreffly, "Bœhm did not think it enough to furvey the ifland of Fayal, which he firft difcovered, or the other adjacent iflands which

which the Lusitanians call Azores, and we, after the example of Bœhm's companions, call Flemish islands, but advanced still farther and farther south, until he arrived at the remotest strait, beyond which Ferdinand Magellan, following his tract, afterwards sailed, and called it after his own name." Magellan, it is said, saw a chart of the coast of America, drawn by Behem, and preserved in the archives of Nuremberg, and hence conceived the project of following the steps of this great navigator. Riccioli, in his Geo. Reform. l. iii. p. 90, says, "Christopher Columbus never thought of an expedition to the West Indies, until some time before, while in the island of Madeira, where, amusing himself in forming and delineating geographical charts, he obtained information from Martin Bœhm, or, as the Spaniards say, from Alphonsus Sanchez de Huelva, a pilot, who, by mere chance, had fallen in with the island afterwards called Dominica." In another place he says, "Let Bœhm and Columbus have each their praise; they were both excellent navigators; but Columbus would never have thought of his expedition to America, had not Bœhm gone there before him. His name is not so much celebrated as that of Columbus, Americus, or Magellan, although he is superior to them all." Martin Behem, in consideration of his great services to the crown of Portugal, was knighted by king John in 1485, in the presence of his whole court. In 1492, the chevalier Behem, crowned with honours and riches, undertook a journey to Nuremberg, to visit his native country and his family; and there he made a terrestrial globe of curious construction, which is still preserved in the library of that city. On this globe is marked the tract of his discoveries, under the appellation of the western lands; and from their situation it cannot be doubted, that they are the present coasts of Brazil, and the environs of the straits of Magellan. This globe was made in the same year when Columbus set out on his expedition; and hence it is inferred, that Behem could not have profited by the observations of this navigator. After having performed several other interesting voyages, the chevalier Behem died at Lisbon in July 1506, universally regretted, and leaving behind him no other work besides the globe already mentioned, which was constructed from the writings of Ptolemy, Pliny, Strabo, and especially from the account of Mark Paul the Venetian, a celebrated traveller of the 13th century, and of John Mandeville, an Englishman, who, about the middle of the 14th century, published an account of a journey of 33 years in Africa and Asia. He has also added the important discoveries made by himself on the coast of Africa and America.

Dr. Robertson treats the history of Behem as a fiction of some German authors, who were inclined to attribute to one of their countrymen a discovery which has produced so great a revolution in the commerce of Europe. Nevertheless, he acknowledges with Herrera, that Behem had settled in the island of Fayal; that he was the intimate friend of Columbus, and that Magellan had a globe made by Behem, by the help of which he undertook his voyage to the south sea. He also relates, that in 1492 this geographer visited his family at Nuremberg, and left there a map drawn by himself, a copy of which was procured for him by Dr. Reinhold Foster, and which, in his opinion, partakes of the imperfection of the cosmographical knowledge of the 15th century; as he found in it, under the name of the island of St. Brandon, land which appears to be the present coast of Guiana, and which lies in the same latitude with the cape Verd isles; and he conceives that this is an imaginary island, which has been admitted into some ancient maps, on no better authority than the legend of the Irish St. Brandon or Brendan, whose story is so childishly fabulous as to be unworthy of any notice. He adds, that hardly any one place is laid down in its true situation. M. Otto thinks that Dr. Robertson furnishes, in his own history, means of refuting his objections against the truth of Behem's history. This learned historian allows, that Behem was very intimate with Columbus, that he was the greatest geographer of his time, and that he had been the disciple of the celebrated John Muller or Regiomontanus; that he had discovered, in 1483, the kingdom of Congo on the coast of Africa; that he constructed a globe, used by Magellan; that he drew a map at Nuremberg, containing the particulars of his discoveries; and that he placed in this chart land, which is found to be in the latitude of Guiana. Whilst Dr. Robertson asserts, without any proof, that this land was but a fabulous island, we may suppose, says M. Otto, upon the same foundation, that the chevalier Behem, engaged in an expedition to the kingdom of Congo, was driven by the winds to Fernambouc, and from thence by the currents, very common in these latitudes, towards the coast of Guiana; and that he took for an island the first land which he discovered. The course which Christopher Columbus afterwards steered, makes this supposition still more probable; for if he knew only of the coast of Brazil, which they believe to have been discovered by Behem, he would have laid his course rather to the south-west. The expedition took place in 1483; it is then possible that, at his returning, Behem proposed a voyage to the coasts of Brazil and Patagonia, and that he requested the assistance of his sovereign, which has been already mentioned. "It is certain," says M. Otto, "that we cannot have too much deference for the opinion of so eminent a writer as Robertson, but this learned man not having it in his power to consult the German pieces in the original, which we have quoted, we may be allowed to form a different opinion, without being too presumptuous." For a farther discussion of this subject, see M. Otto's Memoir on the discovery of America, in the Transactions of the American Society at Philadelphia, vol. ii. p. 263, &c. Robertson's Hist. of America, vol. i. p. 371, &c.

BEHEME, or RAMSEY, SAND, in *Geography*. See RAMSEY.

BEHEMOTH, in *Zoology*, a huge animal mentioned in Scripture, concerning which interpreters are much divided. The strength of this creature, his manner of life, and some other particulars, we find admirably pourtrayed in the forty-first chapter of the book of Job, and from that description some have thought it could apply only to the elephant, but it certainly more fully agrees with the hippopotamus, or river horse; and this is now pretty generally believed to be the animal in question. Bochart, Franzius, and others, who have endeavoured to ascertain all the animals mentioned in the Old Testament, entertain this opinion. See HIPPOPOTAMUS and MAMMOTH.

BEHEN, in *Botany*. See CENTAUREA and CUCUBALUS.

BEHERUS, in *Geography*, a town of Asia, in the Arabian Irak, 20 miles N.N.E of Bagdat.

BEHIRE, in *Geography*, a lake of Lower Egypt, 7 leagues in compass, near Aboukir. This is also the name of a district called Bahira, which see.

BEHIU, a town of Egypt, near the Nile, 17 miles S. of Abu Girgé.

BEHKER, or BHAKOR, a district of India, in the southern part of the country of Moultan, confined chiefly to the east side of the Indus. This is also the name of a town, which is the capital of the country to which it gives name, about 215 geographical miles distant from Moultan to the south, and supposed in the Ayin Acbaree to be the ancient Mansurah. N. lat. 27° 12′. E long. 70° 1′.

BEHLULIA,

BEHLULIA, a town of Syria, 40 miles south-west of Aleppo.

BEHMEN, or Boehm, Jacob, in *Biography*, commonly called by his admirers, the "German Theosophist," was born of poor parents at a village near Gorlitz, in Upper Lusatia, in 1575. Having been taught to read and write, at the age of 10 years, he was apprenticed to a shoe-maker, or taylor, and in 1594 became a master and was married. Although he never entirely forsook his occupation, his eccentric genius soon carried him "ultra crepidam," beyond his last. Engaging in those theological controversies, which were spreading in his time through Germany, among the lower classes of the people, he was much perplexed concerning many articles of faith, and prayed earnestly for divine illumination. In this state of mind he fell into a trance or extacy in 1600, which lasted for seven days, and afforded him an intuitive vision of God. Soon afterwards he had a second extacy, in which he found himself surrounded on a sudden with celestial irradiations, his spirit being carried to the inmost world of nature, and enabled to penetrate through the external forms, lineaments and colours of bodies, into the recess of their essences. In a third vision of the same kind, other more sublime mysteries were revealed to him, concerning the origin of nature, and the formation of all things, and even concerning divine principles and intelligent natures. These wonderful communications he committed to writing in 1612; and published a book, entitled "Aurora," the principles and style of which are so mysterious and obscure, that it is not easy to understand or explain them. Indeed the author himself declares that the mysteries of this book are incomprehensible to flesh and blood, and that though the words be read, their meaning will lie concealed, till the reader has by prayer obtained illumination from that heavenly spirit, which is in God, and in all nature, and from which all things proceed. Gregorius Richter, a clergyman of Gorlitz, having seen this work, reproved the author from the pulpit, and procured an order from the senate of the city for suppressing it; and Behmen was required to discontinue his atempts for enlightening the world by his writings. Behmen acquiesced, and refrained from writing for 7 years. A copy of the work, however, found its way to the press at Amsterdam, in 1619; and in the same year he wrote another book on the three principles, to which in the course of a few years he added several others. In 1624 he travelled to Dresden, where he was examined by a body of divines, and dismissed without censure. He died in the same year, after having received the sacrament from the hands of Elias Dietrich, and was honourably interred at Gorlitz. His other works are "Of the Three-fold Life of Man;" "Answer to the Forty Questions of the Soul;" "Of the Incarnation of Christ, his Sufferings, Death, and Resurrection;" "A Book on the Six Points;" "On Celestial and Terrestrial Mysteries;" "De Scriptura Rerum;" "On the Four Complexions;" "On True Repentance;" "On True Resignation;" "On the Second Birth;" "Mysterium Magnum;" "On the First Book of Moses;" "On Spiritual Life," &c. These treatises appeared separately, and were afterwards collected and printed together. The best edition is said to be that in 12mo. published in German, at Amsterdam, in 1682. An English edition of his works was given by Mr. William Law, in 2 vols. 4to.

In Jacob Behmen, a warm imagination, united with a gloomy temper, produced that kind of enthusiasm, which in its paroxysms disturbs the natural faculties of perception and understanding, and produces a preternatural agitation of the nervous system, during which the mind is filled with wild and wonderful conceptions, which pass for visions and revelations. Every page of his works, and even the hieroglyphic figures prefixed to his works, manifest a disordered imagination, and it is in vain to attempt to derive his "Theosophia," from any other source; unless we incline to admit his own account, in which he boasts that he was neither indebted to human learning, nor was to be ranked among ordinary philosophers. He says that he wrote "not from an external view of nature, but from the dictates of the spirit: and that what he delivered concerning the nature of things, and concerning the works and creatures of God, had been laid open before his mind by God himself." The conceptions of this enthusiast, sufficiently obscure in themselves, are often rendered more obscure by being clothed under allegorical symbols, derived from the chemical art. As he frequently uses the same terms with Paracelsus, he was probably conversant with his writings. He also appears to have acquired some knowledge of the doctrine of Robert Fludd, a native of England, and the Rosicrusians, which was propagated in Germany with great ostentation during the 17th century. However, he seems, upon the whole, to have followed no other guides than his own inventive genius and enthusiastic imagination; and every attempt which has been made by his followers to explain his system has been only raising a fresh ignis fatuus, to lead the bewildered traveller farther astray. Among other tenets, equally inexplicable, this mystic makes God the essence of essences, and he supposes a long series of spiritual natures, and even matter itself to have flowed from the fountain of the divine nature. Upon these subjects his language resembles that of the Jewish cabbala. The whole Divine Trinity, he says, spreading forth bodily forms, produces an image of itself, "as a God in miniature." If any one name the heavens, the earth, the stars, the elements, and whatever is beneath or above the heavens, he herein names the whole deity, who, by a power proceeding from himself, thus makes his own essence corporeal. There is a great darkness, he says, among the stars, where the devil holds his principality; all arts and sciences flow from the siderial spirit of this world; the seven liberal arts proceed from seven spirits of nature; and all human things are composed of the four first properties, bitter, sour, heat, and pain. The divine grace, says this chimerical writer, operates by the same rules, and follows the same methods that the divine Providence observes in the natural world; and the minds of men are purged from their vices and corruptions in the same way that metals are purged from their dross; and this maxim was the principle of his fire-theology. But it is needless to give any farther account of a system which exhibits a motley mixture of chemical terms, crude visions, and mystic jargon. The elements of Behmen's theology may be collected from his "Aurora," and his treatise "on three principles."

Some have bestowed high praises on this enthusiast, on account of the wisdom which they pretend is contained in his writings, and also of his piety, integrity, and sincere love of truth and virtue. Others have accused him of the most dangerous errors, and have written volumes in opposition to his doctrines. Amongst the most eminent of his followers and admirers, we may reckon John Lewis, Giftthiel, John Angelus, Werdenhagen, Abraham Franckenberg, who wrote his life, Theodore Tschetch, a Silesian nobleman, Paul Felgenhaver, Quirinus Kuhlman, who was burnt at Moscow in 1684, John Jacob Zimmermann, and our visionary countryman William Law, author of "Christian Perfection." Among Behmen's numerous followers, no one rendered himself more conspicuous than John Pordage, a physician and naturalist, and member of the "Philadelphian Society," who pretended to divine revelation, and declared that he was thus convinced of the truth of Behmen's doctrines. He published a book entitled "Divine and True Metaphysics," with other similar works in favour of Behmen's opinions, which being

being ſoon ſpread throughout Germany, became, together with his other writings, the ſtandard books of all enthuſiaſts. To the claſs of his adverſaries we may refer Gilbert Iſcheſchius, who publiſhed an admonition againſt his works in 1643, which was anſwered by Tſchetſch, Gerrard Antagnoſſus, who refuted Tſchetſch, and who endeavoured to ſhew that Behmen entertained the ſame opinions as the Manichæans and Gnoſtics; Tobias Wagner, and Dr. Henry More, who wrote a treatiſe againſt Behmeniſm, entitled "Cenſura Philoſophiæ Teutonicæ," printed in his works, p. 520. Some perſons have attempted to prove from Behmen's writings, that he did not acknowledge a deity; and particularly Von Muller, in a work entitled "The Fanatic Atheiſt." Brucker's Hiſt. Phil. by Enfield, vol. ii. p. 494, &c. Moſheim's Eccl. Hiſt. vol. v. p. 310, &c.

BEHMENISTS, or Bohmists, in *Eccleſiaſtical Hiſtory*, the denomination of a claſs of myſtic philoſophers, who were the followers of Jacob Behmen, commonly called the Teutonic philoſopher. See the preceding article.

BEHN, Aphara, in *Biography*, a writer of novels and plays, was deſcended of a good family of the name of Johnſon in Canterbury, and born in the reign of king Charles I. Her father died at ſea in a voyage for Surinam, of which he was appointed lieutenant-governor by the intereſt of lord Willoughby, to whom he was related; but his daughter, with the reſt of the family, arrived thither. Here ſhe became acquainted with the ſtory and perſon of the American prince Oroonoko, whoſe adventures ſhe deſcribed in a novel under this title. After her return to England ſhe married Mr. Behn, a merchant in London, of Dutch extraction. During the Dutch war in the reign of Charles II. ſhe was employed for gaining intelligence on the continent, and with this view ſhe reſided at Antwerp. By her intrigues, it is ſaid, ſhe diſcovered the deſign, formed by the Dutch, of ſailing up the river Thames, and burning the Engliſh ſhips in their harbours; but her intelligence was ſlighted by the Engliſh court, to which it was imparted. On her return to England ſhe narrowly eſcaped ſhipwreck. Her future life was devoted to pleaſure and poetry; and by writing ſhe gained a ſubſiſtence. With a good perſon, and diſtinguiſhed talents for converſation, ſhe formed an intimate acquaintance with ſeveral poets and wits of her time, as well as men of pleaſure. Her compoſitions, in verſe and proſe, were numerous; and ſhe publiſhed three volumes of miſcellaneous poems, ſeventeen plays, and a collection of hiſtories and novels, beſides ſome tranſlations and letters. She borrowed much from other writers, and the merit, that was properly her own, conſiſted in a fluent eaſy ſtyle, occaſionally glowing with the ardour of love, when this ſubject was the topic, and in ſome ſprightly thoughts and facility of invention. Many of her plays ſucceeded on the ſtage, at a period when groſs indecency of plot and language was no impediment to their reception. Her poetical appellation was Aſtrea; and her dramatic compoſitions are characteriſed by Mr. Pope in the following lines:

"The ſtage how looſely does Aſtrea tread,
Who fairly puts all characters to bed."

None of her dramatic pieces are now acted; her poetry has been long forgotten; but her novels, which were once popular, are now occaſionally read. Her death, which was haſtened by an injudicious phyſician, happened in 1689, when ſhe was between the age of 40 and 50; and ſhe was buried in the cloiſters of Weſtminſter Abbey. Biog. Brit. Gen. Dict.

BEHNESE, or Bahnasaa, in *Geography*, a town of Egypt, 10 miles north of Abu Girgé.

BEHRENS, Conrad, Berthold, in *Biography*, was born at Hildersheim, in Lower Saxony, Auguſt 26th 1660. After paſſing through the uſual courſe of ſtudies in the claſſics and philoſophy, in his own country, and reſiding for ſome time at Straſburg and Leyden, he took the degree of Doctor in Medicine at Helmſtadt, was made phyſician to the army of the duke of Brunſwick, and in 1712 to the court of Brunſwick Lunenburg, and member of the Academy Naturæ Curioſorum, to the Memoirs of which he was a conſiderable contributor. His principal works are, "De Conſtitutione Artis Medicæ," Helmſt. 1691, 8vo. "Medicus Legalis," 1696, 8vo. publiſhed in German. In this he treats of the duties and office of phyſicians, ſurgeons, apothecaries, and midwives, of alchemy, of magnetiſm applied to medicine, and of the cauſes of ſudden death, on which he has ſome judicious obſervations. "Selecta Dietetica, ſive de recta ad ſanitatem vivendi ratione tractatus," Francf. 1710, 4to. He died October 4th 1738. His ſon Rodolph Auguſtus Behrens, who ſucceeded to his honours and practice, publiſhed "De Felicitate Medicorum Aucta in terris Brunvicenſibus," 1747, 4to. occaſioned by ſome additional privileges accorded to the phyſicians there. In this work he takes occaſion to comment on, and refute the opinion of Middleton, as to the ſervile condition of phyſicians among the Romans.

BEHUT, called alſo Betuh, Ihylum, or Chelum, in *Geography*, a river of Hindooſtan, is the weſternmoſt of the five rivers that water the Panjab; and its general courſe is eaſt, and nearly parallel to that of the Attock, but it is of a leſs bulk. This is the famous Hydaſpes of Alexander, on the banks of which he was oppoſed by Porus, a powerful monarch of the country, at the head of a numerous army. By the Ayin Acbaree, it is ſaid to be anciently called Bedulta. The Behut iſſues from the ſpring of Wair, or Wair Naig, in the ſouth-eaſt part of Caſhmere, and after a north-weſt courſe through that valley, enters the mountains at Barehmooleh. During this ſhort courſe it receives abundance of rivulets and ſtreams from ſome large lakes, and becomes navigable at a few miles below its remoteſt ſpring. After entering the mountains it purſues the direction of the Panjab by a very crooked courſe, being pent up in a deep winding valley, whilſt eſcaping from the wide baſe of the Caſhmerian mountains, and ruſhing with ſuch rapidity and violence that even the ſtouteſt elephant cannot preſerve his footing in it. It emerges from the mountains in the diſtrict of Puckholi, and is afterwards joined by two ſmall but celebrated rivers named Kiſkengonga and Nainſook. After this it traverſes the territory of the Ghickers, ſtill holding its courſe through a hilly country, until it croſſes the upper or great road leading from Lahore to Attock, where the hilly tract is confined to the weſtern bank. Here ſtood, not long ſince, a city of the name of Ihylum, which communicated its name to the river, during the remaining part of its courſe; and hence it is as commonly named Ihylum as Behut. From Ihylum it purſues its courſe along the eaſtern borders of the Joud mountains, and unites with the Chunaub at about 50 geographical miles above Moultan; loſing its name in that of the Chunaub, as heretofore it loſt its name of Hydaſpes in that of Aceſines, the ancient name of the Chunaub. The interval between the Behut and the Indus, in the wideſt part, is about 94 geographical miles. Pliny allows only 120 Roman miles between the Indus and the Hydaſpes. Rennell's Mem. p. 99. Robertſon's India, p. 18.

BEIA, Pax Julia, an ancient city of Portugal, in the province of Alentejo, near a lake of the ſame name. It is mentioned by Pliny, Ptolemy, and Antoninus. Several Roman coins and inſcriptions have been found near this place.

Its ſituation is on a gentle hill in a fertile country rich in corn, and it is ſurrounded with walls and gates; and it is the

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fee of a bishop, a corregidor, and a governor. It was taken from the Moors in 1162. N. lat. 37° 58'. W. long. 7° 20'.

BEJA, a large extent of country in Abyssinia, lying between the northern tropic and the mountains of Abyssinia, reaching from Masuah along the coast of the Red Sea to Suakem; then turning westward, and continuing in that direction, with the Nile on the south, the tropic on the north, to the deserts of Selima, and the confines of Libya on the west. See ABYSSINIA.

BEJA of Tunis. See BAY-JAH.

BEJAD, a village of Egypt, opposite to Benisouef, partly inhabited by Copts.

BÉJAPOUR, or VISIAPOUR, a considerable city of Hindoostan, and once the capital of a large kingdom of the same name. It is now in the hands of the Poonah Mahrattas; distant 234 miles from Bombay, from Calcutta by the Circars, 1183, and by Aurungabad 1216, from Delhi 916, from Hydrabad 269, from Madras 534, from Poonah 136, from Seringapatam 405, from Benares 876, and from Agra 825 miles. N. lat. 17° 28'. E. long. 75° 27'.

BEJAR, a small town of Spain, in the province of Estremadura, seated in the midst of a pleasant valley between high mountains, whose tops are continually covered with snow. It is famous for its baths, and in its vicinity is a lake, which is said to presage bad weather by an unusual agitation. It was raised into a duchy in 1448.

BEJAR *de Mekna*, or *Bejer*, a town of Spain, in Andalusia, near the straits of Gibraltar, 8 leagues south of Cadiz.

BEJARIA, so called by Mutis, in honour of Bejar, a Spanish botanist, in *Botany*. Lin. Gen. Reich. n. 648. Schreb. 811. Juss. 159. Class and order, *dodecandria monogynia*. Nat. Ord. *Bicornes*. *Rhododendra*, Juss. Gen. Char. *Cal.* perianth one-leafed, gibbous downwards, subventricose, seven-cleft; divisions subequal, ovate, acute, converging, small; the outer ones broader, permanent. *Cor.* petals seven, oblong, broader above, obtuse, patulous, inserted into the receptacle. *Stam.* filaments fourteen, subulate, rather shorter than the corolla, alternately less; anther oblong, incumbent. *Pist.* germ superior; style columnar, middle-sized, [illegible]ent; stigma thickish, seven-striated. *Per.* berry juice-less, seven-cornered, depressed, umbilicate, seven-celled. *Seeds* numerous, columnar-oblong, imbricate.

Essent. Char. *Cal.* seven-cleft. *Petals* seven. *Stam.* fourteen. *Berry* seven-celled, many seeded.

Species, 1. B. *asthma*. Mutis Amer. i. t. 7. "Leaves lanceolate, flowers in racemes." A shrub twelve feet high, with roundish spreading branches. A native of Mexico. Found in New Granada by Mutis. 2. B. *resinosa*. Mutis Amer. i. t. 8. "Leaves ovate, flowers heaped." A tree with proliferous branches, and an irregular, tender, subpubescent bark; corolla purple, very resinous or viscid. Found in New Granada by Mutis. These have a peculiar bitter flavour, and are allied to the rhododendrum. The name was erroneously made "Besaria" by Linnæus.

BEIBENIÆ *Stellæ*, in *Astronomy*, a name given by some astronomers to the principal fixed stars in each constellation.

The appellation is more particularly given to the stars of the first magnitude, otherwise called the hearts, *cordæ*, of the several constellations; though some would distinguish between *cordæ*, and *beibeniæ stellæ*, restraining the former to stars only of the first magnitude, and extending the latter to several of the second, or even third.

Hermes has a treatise express De Stellis Beibeniis, published by Junctinus, in his Speculum Astrologicum, and also in his commentaries upon Jo. de Sacrobosco's book De Sphæra.

BEICHLINGEN, in *Geography*, a town of Germany, in the circle of Upper Saxony, and country of Thuringia, 6 miles S. W. of Wiehe. N. lat. 51° 20'. E. long. 11° 50'.

BEILA, a town of Italy, in Piedmont. N. lat. 45° 2'. E. long. 7° 45'.

BEILAM, a town of Syria, S. E. of Scandereon or Alexandretta. N. lat. 36° 26'. E. long. 36° 31'.

BEILNGRIES, a town of Germany, in the circle of Franconia, and bishopric of Aichstadt, at the confluence of the Attmaid, and the Soulz, 16 miles north of Ingolstadt.

BEILSTEIN, a small town and citadel of Germany, in the Rhenish circle, and capital of a lordship to which it gives name, comprising about fifty villages, in the principality of Nassau Dillenburg; 5 miles south of Dillenburg. The lordship belongs to the princely house of Nassau-Orange Dietz, which enjoys, in consequence of it, a seat and voice at the diets of the electoral Rhenish circle. N. lat. 50° 31'. E. long. 8° 11'.—Also, a small town of Germany, in the duchy of Wurtemberg. In 1693, it was burnt by the French. Its district comprehends several villages.

BEILUL, a town of Abyssinia, situate on the Red Sea north of Assab. N. lat. 14°. E. long. 41° 58'.

BEINA, a river of Norway, in the government of Christiania, which runs into the lake of Sperdillon; and serves for exporting timber.

BEINAC, a town of France, in the department of Correze, and chief place of a canton, in the district of Brive, 8 miles south of Tulle.

BEINASCHI, GIOVANNI BATTISTA, in *Biography*, an historical painter, was born in Piedmont in 1634, and studied at Rome under Pietro del Po, and as some say, was afterwards a disciple of Lanfranc. He died in 1688. Beinaschi was an admirable designer, of a lively invention, and not only expeditious, but correct. As an acknowledgment of his merit, he received the honour of knighthood.

BEINASCO, in *Geography*, a town of Piedmont, 4½ miles S. S. W. of Turin.

BEINDGHURA, a town of Hindoostan, in the district of Bencapour, part of the territory of the Mahrattas. N. lat. 15° 15'. E. long. 75° 11'.

BEINE, a town of France, in the department of the Marne, and chief place of a canton, in the district of Reims; the place contains 675, and the canton 8474 inhabitants; the territory includes 352½ kiliometres and 19 communes.

BEING, in *Metaphysics*, includes not only whatsoever actually is, but whatsoever can be. It is the first and most obvious, the most simple and natural conception that we can frame of any thing which we see, hear, feel, or know. It is in some sense comprehended in all our other conceptions of things, and is therefore the most general or universal of all our ideas. By the affections of being, are meant all powers, properties, accidents, relations, passions, dispositions, internal qualites, external adjuncts, considerations, conditions, or circumstances whatsoever; or, in a word, all those modes which belong to things, either as they are in themselves, or as they stand in relation to other things, or as they are represented or modified by our ideas and conceptions. The various kinds of beings have been referred by writers on this subject into three distinct classes, and they have been considered as either substances or modes, finite or infinite, and natural, artificial, or moral. For the two former classes, see SUBSTANCE, MODE, FINITE, and INFINITE. Natural beings are all those things that have a real and proper existence in the universe, and are considered as formed and ordained by God the creator; such are bodies, spirits, men, beasts, trees, fruit, countenance, sense, reason, fire, air, light, &c. Artificial beings are made by the contrivance or operations of men, whether they are of a more corporeal nature, such as houses, windows, pictures, statues, arms, garments, writing, music, and the various utensils of life; or whether they relate more to intellectual matters, as words, sciences,

rules, arguments, propoſitions, verſe, proſe, &c. Moral beings are thoſe which belong to the conduct and government of intelligent creatures, or creatures endowed with underſtanding and volition, conſidered as lying under obligations to particular actions or abſtinences: but theſe conſidered as moral are only modal; ſuch are law, duty, virtue, vice, ſin, righteouſneſs, judgment, condemnation, reward, puniſhment. Theſe diſtinctions however might, perhaps, be more properly reſerved to the ſeparate claſſes of different ideas than different beings. Being is the ſubject of Ontology. See ONTOLOGY. See alſo ESSENCE and EXISTENCE.

BEINHEIM, in *Geography*, a town of Germany, in the circle of Swabia, ſeated on the weſt ſide of the Rhine, and belonging to the marquiſate of Baden; 6 leagues N.N.E. of Straſburg.

BEINIGKEMEN, a town of Lithuania, 12 miles north of Pilkallen.

BEIRA, a large and fertile province of Portugal, bounded on the north by the province of Entre Duero a Minho, from which it is ſeparated by the river Duero or Douro, and by Tralos Montes; on the weſt by the ocean and part of Eſtremadura; on the ſouth by another part of that province and by the Tagus; and on the eaſt by the Spaniſh Eſtremadura, and the kingdom of Leon. It is divided into Upper and Lower Beira; the former being the northern part, and lying on the ſea-coaſt; the latter lying towards Spain and Eſtremadura. Its extent from eaſt to weſt is generally computed at betwixt 33 and 36 Portugueſe miles; and from north to ſouth about as many. It was erected into a principality by John V. in honour of his grandſon, the eldeſt ſon of the prince of Braſil. It produces wheat, rye, and millet; and, in ſeveral parts, excellent wine and oil in ſuch abundance, that conſiderable quantities of each are exported. Beira comprehends eight juriſdictions, and its principal cities and towns are Coimbra, Lamego, Guarda, Viſeu, Miranda do Corvo, Tentugal, Aveiro, Ovar, Pinhel, Almeida, Francoſo, Meda, Caſtello Branco, Penamacor, and Covilhaa; the four firſt are epiſcopal cities. The militia of this province conſiſt of eight regiments, each regiment including about 1000 men.

BEIRAGUR, a town of Hindooſtan, on the weſt of Boad, and near the Mahanuddy river, noted in the Ayin Acbaree, as having a diamond mine in its neighbourhood.

BEIRAM. See BAIRAM.

BEIRUT. See BAIROUT and BERYTUS.

BEISCH, JOACHIM FRANCIS, in *Biography*, a painter of landſcapes and battles, was born at Ravenſburg, in Swabia, in 1665; and having received the firſt rudiments of the art of painting from his father, who employed himſelf in this way for his amuſement, he became a good artiſt by the force of his own genius and by aſſiduous practice. He was engaged at the court of Munich, and painted the battles fought in Hungary by the elector Maximilian Emanuel. During the abſence of the emperor on ſome of his expeditions, Beiſch viſited Italy, and there, with a view to his further improvement, ſtudied and copied the famous models to which he had acceſs. Before his journey to Italy, his manner was true, but too dark; his ſecond had more clearneſs and more truth; and his laſt was more clear but more weak. The ſcenes of his landſcapes are agreeably picturesque; his touch is light, tender, and full of ſpirit; and his ſtyle of compoſition frequently reſembled that of Gaſpar Pouſſin, or Salvator Roſa. He died in 1748. Pilkington.

BEISHEHIA, or BISHEHRI, in *Geography*, a town of Aſiatic Turkey, in Caramania, ſeated near a lake. N. lat. 37° 45′. E. long. 32° 11′.

BEISSKER, in *Ichthyology*. See BEYSSKER, or BEYZKER, and COBITIS FOSSILIS. Linn.

BEISSONS, in *Geography*, a place of Africa, in the kingdom of Tunis, ſituate between Taberſoke and Dugga, at which there are found ſome antique remains and inſcriptions.

BEISTEN, a town of Pruſſia, in the province of Natangen, 26 miles ſouth of Konigſberg.

BEIT ABUFARRA, a town of Arabia, 24 miles N.N.E. of Wadeij.

BEIT *el Adham*, a town of Arabia, 24 miles S.W. of Sanaa.

BEIT *Elam*, a town of Syria, ſouth of Antakia. N. lat. 36° 5′. E. long. 36° 32′.

BEIT *el Fakih*, a city of Arabia, in the country of Yemen, ſituated on a plain, which, though far from being naturally fertile, is induſtriouſly cultivated. The houſes, many of which are of ſtone, are ſeparated from one another; and the city has a citadel, which is thought of the utmoſt importance in a country where armies are deſtitute of artillery. The town is much moleſted by a ſpecies of ants, called by the Arabs, "Ard." Beit el Fakih is not very ancient: though it has exiſted for ſome centuries. It owes its origin to a ſaint, called "Achmed iba Muſa," from whom it has derived its name; Beit el Fakih denoting the "houſe or dwelling of the ſage." Near the city is ſhewn the tomb of the ſaint, upon a ſandy hill, where a fine moſque has been erected, and where ſeveral devout perſons have built cottages round the tomb. When the harbour of Ghalefka was choaked up, the inhabitants of that city, for the convenience of trade, removed their effects to the vicinity of this tomb, and ſettled about it. When it became a conſiderable city, the lord of the territory erected a citadel for its defence, in the place where water had been found. This city is very favourably ſituated for trade; being only half a day's journey from the hills in which coffee grows, and but a few days' journey from the harbours of Loheia, Hodeida, and Mocha, from which this commodity is exported. This trade brings hither merchants from Egypt, Syria, Barbary, Perſia, Habbeſch, India, and often from Europe. Beit el Fakih is the reſidence of a Dola, whoſe juriſdiction extends over a large diſtrict. Niebuhr mentions a ſingular inſtance, which occurred at this place, and which ſtrikingly indicates the coolneſs of temper and firmneſs of mind, that diſtinguiſh the Arab character. The ſouthern end of a houſe caught fire; and as the wind blew ſtrong from the ſouth, a great part of the city was ſoon burnt down. The inhabitants, however, retained their uſual tranquillity. No cries nor complaints were heard in the ſtreets; and when the people were addreſſed with expreſſions of condolence, upon their misfortune, they calmly replied, "It is the will of God." N. lat. 14° 31′. E. long. 43° 12′. Niebuhr's Trav. vol. i. p. 311.

BEIT *el Kadi*, a town of Arabia, in the country of Yemen, 34 miles north of Chamir.

BEIT *el Naum*, a town of Arabia, in Yemen, 24 miles ſouth-eaſt of Sanaa.

BEIT *Ebn Safan*, a town of Arabia, in Yemen, 28 miles S.S.E. of Saade.

BEIT *Ebn Meri*, a town of Arabia, in Yemen, 38 miles N. of Chamir.

BEIT *Ebn Naſr*, a town of Arabia, in Yemen, 34 miles N. of Chamir.

BEIT *Rodsje*, a town of Arabia, in Yemen, 24 miles S.E. of Sanaa.

BEIT *Il Tola*, a town of Arabia, in Yemen, 28 miles S. of Saade.

BEIT *Ebn Shemſhar*, a town of Arabia, in Yemen, 28 miles E. of Abu-Ariſch.

BEIT *El Weil*, a town of Arabia, in Yemen, 3 miles N. of Denn.

BEITH, a town of Scotland, in the diſtrict of Cunning-

ham, and county of Ayr. It is seated on a small eminence, and the streets are pretty regularly laid out. A linen manufactory gives employment to many of its inhabitants, and others are occupied in making silk-gauze and cotton. Some considerable manufacturers reside in the town, and though it is said to have consisted of only a few inhabitants at the commencement of the last century, yet the population now amounts to about 1800. The parish, extending about five miles in length, by four in breadth, consists principally of arable land; but some farms, with others at Dunlop, are appropriated to the dairy system, and have long been famous for a particular cheese called the *Dunlop cheese*. Within the boundary of the parish is a small loch, containing abundance of fish, and near it is plenty of peat moss. Coal is found in many places; freestone is abundant, and the limestone quarries are almost inexhaustible. In the latter substance are frequently found various petrifactions of shells, and other marine exuvia; also many other silicious petrifactions of woods, mosses, &c. The population of the parish and town in 1792, was 2872. Sinclair's Statistical Account of Scotland.

BEITHAR, Ben, in *Biography*, a learned Arabian botanist, called *Ashbad*, the botanist, from his skill in the science of plants, was born in Spain; and after visiting Africa, travelled into the Levant, Asia, and even as far as the Indies to improve his knowledge. After his return he was patronised by Saladin at Cairo, and died in 1248. He wrote "A General History of Simples, or of Plants, arranged in alphabetical order;" in which he gives the Greek, Arabic, and vernacular names, with the descriptions of each, and particularly in a more detailed manner, those not described by Dioscorides and Pliny. Beithar's work is extant in the Parisian, Escurial, and other libraries. Herbelot. Pulteney's Hist. and Biog. Sketches, &c. vol. i. p. 19.

BEITSTADT, in *Geography*, a lake in the northern part of Norway.

BEIUCO, in *Botany*. See Hippocratea.

BEJWARA, called also *Hoshearpour*, in *Geography*, a town of Hindoostan, in the country of Lahore, about 3 journies or 36 cosses from Sirhind, 16 cosses N.E. of Jallindhar, and about 25 geographical miles north of Rahoon, and about 30 such miles from Hurepour.

BEIZA, or Beziath, a Hebrew word, signifying an egg, in Jewish *Antiquity*, a certain measure in use among the Jews; they say that the beiza contains the sixth part of a log.

The beiza is also a sort of gold coin common among the Persians; it weighs forty drachmas, and from this word, not from the city of Byzantium, the bezant was formed. A bezant is worth two dinars, and every dinar twenty or five and twenty drachmas.

BEK, David, in *Biography*. See Beck.

BEKAA, in *Geography*, a valley of Syria, anciently called Cœle-Syria, or the hollow Syria, separates the chain of mountains denominated by the ancients Anti-Libanus, from the Libanus of the Druzes and Maronites, and by being the depository of the water of the mountains that enclose it, is rendered one of the most fertile districts of all Syria; but the heat of the sun, the rays of which are concentrated by the mountains, is in summer not inferior to that of Egypt. The air, however, which is perpetually refreshed by the north wind and by the agitation of the waters, is not unhealthy. Before the earthquake of 1759, this whole country was covered with villages and plantations of the Motoualis; but the destruction occasioned by this terrible calamity, and the subsequent wars with the Turks, have occasioned a general desolation. In this vale is situated the famous Balbec.

BEKAVA, or Bekawa, a small town of Poland, in the palatinate of Lublin.

BEKES, a town of Upper Hungary, on the river Koros, which gives name to the Gepenschaft.

BEKI, Beg, or Beye, a river of Hungary, which runs into the Temes, near Temeswar.

BEKIA, Becouya, or Boquio, a small British island of the West Indies, about 12 leagues in compass, and containing 3,700 acres, being the least of the Grenadilles, called by the French, "Little Martinico;" 35 miles N.E. of Grenada, and 65 leagues from Barbadoes. It has a safe harbour, called "Admiralty-bay," but no fresh water; and is principally visited by the inhabitants of Grenada and St. Vincent's for the purpose of catching turtle. The soil produces wild cotton, and plenty of water-melons. This island is dependant on the government of St. Vincent.

BEKIER, a name given by mariners to Aboukir, which see.

BEKING, a town of France, in the department of the Moselle, and chief place of a canton, in the district of Sar-Louis, on the Sarre, 5 miles N.N.W. of Sar-Louis.

BEKKER, or Becker, Balthasar, in *Biography*, a famous Dutch divine of the 17th century, was born in 1634, at Warthuisen, a village in the province of Groningen, and pursued his studies first in the university of Groningen, and afterwards at Franeker, where he became rector of the Latin school. In 1665, he took his degree of doctor of divinity at Franeker, and in the following year he was chosen one of the ministers of that city. In 1670, he published a catechism, intended for persons of mature age, in which he maintained some opinions concerning the right of Christian congregations to chuse their own ministers, and concerning the antiquity and usefulness of bishops, archbishops, &c. and in which he introduced some suggestions that implied his doubt of the eternity of hell torments, as inconsistent with the divine goodness, which gave offence to several divines, and which incurred a prosecution before the ecclesiastical assemblies. This catechism, however, was approved and commended by several learned professors; and it appears that the author had not, at the time of its publication, adopted those sentiments which involved him in future difficulties. In 1679, he was elected minister at Amsterdam; and in 1683, he published his "Inquiry concerning Comets," in which he concurred with Mr. Bayle in maintaining that they are not presages of any evil. By this work, as well as his "Exposition upon Daniel," he gained great reputation; but having attached himself from an early period of his life to the Cartesian philosophy, he adopted Descartes's definition of spirit, and he was hence led to deny all those operations of the devil and other infernal agents upon mankind, which are related in the scriptures. His argument, as it is briefly stated by Dr. Maclaine, the translator of Mosheim's history, is as follows: "The essence of mind is thought, and the essence of matter is extension. Now, since there is no sort of conformity or connexion between a thought and extension, mind cannot act upon matter, unless these two substances be united as soul and body are in man; and therefore no separate spirits, either good or evil, can act upon mankind. Such acting is *miraculous*; and miracles can be performed by God alone. It follows of consequence, that the scripture accounts of the actions and operations of good and evil spirits must be understood in an allegorical sense." To this argument it is replied, that by proving too much, it proves nothing at all: for if the want of a connexion or conformity between thought and extension renders mind incapable of acting upon matter, it is hard to see how their union should remove this incapacity, since the want of conformity and connexion remains notwithstanding this union; Besides, according to this reasoning, the Supreme Being can not act upon material beings; and it is in vain that Bekker maintains the affirmative by having recourse to a miracle for

for this would imply, that the whole courſe of nature was a ſeries of miracles, or in other words, that there are no miracles at all. The author ſuggeſted doubts concerning the agency of the devil in ſeveral of his ſermons; and he alleged, that ſeveral were aſcribed to the devil, in which this evil ſpirit had no concern. He was at length, viz. in 1691, perſuaded to publiſh his ſyſtem at large, in an elaborate work, entitled, "The World Bewitched." This work is divided into four books. The firſt contains an account of the opinions of the ancient and modern heathens concerning gods and demons, or ſpirits. In the ſecond book the author examines all the paſſages of the Holy Scripture, which mention either angels or the devil, and endeavours to make them agree with his opinion, that the devil has not the leaſt power in this world, and to ſhew that thoſe paſſages, which aſcribe ſeveral actions to good as well as bad ſpirits, or angels, muſt be explained in an allegorical manner. Accordingly, he denies that our firſt parents were tempted by the devil; alleging that this temptation is aſcribed to the devil, only becauſe it does not agree with the goodneſs of God, though Moſes does not mention the devil, and that the puniſhment mentioned by Moſes doth not ſuit the devil, but only the ſerpent. He alſo urges ſeveral objections againſt the literal ſenſe of our Saviour's temptation; and he maintains that thoſe poſſeſſed with evil ſpirits, which our Lord caſt out, were merely ſick or lunatic perſons whom he cured, and in whoſe ſickneſs the devil had no concern. (See DÆMONIAC.) Bekker's work, though his ſyſtem was not new, occaſioned great commotion not only in all the United Provinces, but in various parts of Germany. The author, perſiſting in his opinions, was publicly depoſed from his paſtoral charge in 1692; but the magiſtrates of Amſterdam continued his ſalary till his death, which happened in 1698. Bekker not only retained his opinions after his depoſition, but ſtrenuouſly defended them againſt a multitude of adverſaries as long as he lived. He was a man of a warm imagination, of an active mind, and of a firm reſolute temper. His character was irreproachable; and he avowed to the laſt his full conviction of the truth of the Chriſtian religion. In his defences he exhibited a moderation which he did not experience from his antagoniſts. A ſatirical medal was ſtruck at his depoſition, which exhibited the devil, in the habit of a miniſter, riding upon an aſs, and holding a banner in his hand, as a token of the victory which he had gained in the ſynods. His opinions found ſeveral advocates; and he became the head of a ſect which was called after his name. Gen. Dict. Moſheim's Eccl. Hiſt. vol. v. p. 632.

BEKKERANISM, or BEKKERIANISM, in *Eccleſiaſtical Hiſtory*, the ſyſtem or ſentiments of Balth. Bekker, who denied that ſpirits can act or operate on bodies. See the preceding article.

BEL, MATTHIAS, in *Biography*, a learned hiſtorian of Hungary, was born at Orſowa, in 1684; and after ſtudying divinity at the univerſity of Halle, he became firſt, viz. in 1708, rector of the evangelical ſchool at Neuſohl, and in 1714, rector of the ſchool at Preſburg. In 1719, he was hoſen preacher by the German evangelical congregation in hat city, and died ſenior miniſter in 1749. His two moſt valuable works are his "Apparatus ad Hiſtoriam Hungariæ," and his "Notitia Hungariæ Novæ." The latter work was held in ſuch high eſtimation, that it procured for him from the emperor Charles VI. the appointment of imperial hiſtoriographer, and the honour of being admitted into the royal academy of ſciences at Berlin, and alſo into that of Peterſburgh. Pope Clement XII. alſo teſtified his approbation of it by conferring on the author his portrait and eight gold medals. The emperor, upon receiving the ſecond volume of the work, raiſed him to the rank of nobility, but this circumſtance Bel ſtudiouſly concealed. Among his other works are "Prodromus Hungariæ antiquæ et novæ." Norib. 1723, fol.; "Notitia Hungariæ novæ hiſtorio-geographica," Viennæ, 1735-1742, 4 vols. fol.; "Apparatus ad Hiſtoriam Hungariæ, ſive Collectio Miſcella Monumentorum, &c. dec. 1 & 2," Poſon. 1735-46, fol. He alſo tranſlated into the Bohemian language the Bible, and ſome other books.

BEL, CHARLES ANDREW, ſon of the former, was born at Preſburg in 1717, and ſtudied at Jena and Altdorf. In 1741, he became extraordinary profeſſor of philoſophy at Leipſic; and in 1756, he was appointed public profeſſor of poetry, and librarian to the univerſity, with the rank of counſellor of ſtate. He died ſuddenly in 1782. Among his writings are "De vera origine et epocha Hunnorum, Ararum, Hungarorum, in Pannonia," Leipſ 1757, 4to. After the death of Menek, he was employed as editor of the Acta Eruditorum, and of the Leipſic literary gazette, which he conducted from the year 1754 to 1781.

BEL, JOHN-JAMES, was born at Bourdeaux, in 1693, and having purſued his ſtudies with great aſſiduity in the college of the fathers of the oratory, and made diſtinguiſhed acquirements in belles lettres, and alſo in metaphyſics and morals, he was admitted counſellor of parliament in 1720. After ſeveral viſits to Paris, he finally ſettled at Bourdeaux; and in 1737, he was choſen director of the academy: but the exceſs of his application to a variety of ſcientific and literary purſuits haſtened his death in 1738. To the academy of Bourdeaux he left the houſe in which it holds its ſittings, and his valuable library. Beſides ſeveral profeſſional works, M. Bel publiſhed "An Apology for Mr. Houdart de la Motte," 1724, 8vo. which is an ironical criticiſm on the works of that author, and particularly his tragedies; "An Examination of the tragedy of Romulus, by la Motte;" "A Diſſertation on the Abbé Dubos's opinion concerning the preference to be given to the perceptions of taſte above reaſoning, in judging of works of genius;" "Letters containing Obſervations on Voltaire's tragedy of Mariamne;" all which are inſerted, together with ſome other papers of M. Bel, in "Memoirs of Literature and Hiſtory," collected by father des Moletz of the oratory. He was alſo the author of the "Neological Dictionary," augmented by the abbé des Fontaines, and intended to expoſe the new words and affected phraſeology of ſeveral modern writers. Nouv. Dict. Hiſtor.

BEL, in *Botany*, the name of a plant, and alſo of its fruit, called by ſome the cucumis capparis, or caper-cucumber. Avicenna has given the moſt copious account of this plant, which is imperfectly deſcribed by others; and he ſays, that the fruit, which reſembled a caper, was uſed in medicine, and reſembled ginger in the fiery heat of its taſte.

BEL, *St.* in *Geography*, a town of France, in the department of the Rhone and Loire, on the Brevenn; $3\frac{1}{2}$ leagues weſt of Lyons.

BEL, in *Mythology*. See BELUS.

BEL *and the* DRAGON, *Hiſtory of*, in *Biblical Hiſtory*, an apocryphal part of the book of Daniel, which, although it was annexed to this book, and formed the 14th and laſt chapter of it, was uniformly rejected by the Jews, and made no part of their canon of ſcripture. It occurs neither in the Hebrew or Chaldee text, nor in the Greek verſion of the Septuagint, but was taken out of the Greek verſion of Theodotion. Africanus, Euſebius, and Apollinarius, have rejected the narration, not only as uncanonical, but alſo as fabulous; and Jerom alſo concurs in their opinion. Origen maintains the truth of the hiſtory contained in the 13th (ſee SUSANNA,) and 14th chapters, againſt Africanus, but does not aſſert it to be canonical. This hiſtory is alſo cited, as part of

of the prophecy of Daniel, by Irenæus, Clemens Alex. Tertullian, Origen, Cyprian, Didymus, Hilary, Basil, Gregory Nazianzen, Ambrose, and Augustin. Sulpitius Severus, and the author of the Synopsis of St. Athanasius, also mention these histories as part of the sacred text; and Ruffinus upbraids Jerom for having cut off from Daniel the song of the three children, the history of Susanna, and that of Bel and the Dragon. Against the truth of this latter history, allowing it to be apocryphal, it has been alleged, that the ancient title of the LXX. attributed it to Habakkuk, and that Daniel mentioned in this history was a priest; and that therefore he must have been another Daniel to whom this history belongs. To this argument it has been replied, that the character of priest is not given to Daniel in the version of Theodotion, and that the version attributed falsely to the LXX. is not exact. Against the history of the Dragon it has been urged that Habakkuk, who lived in the time of Manasses, was dead when it is supposed that he wrote these things, and was caught up by the spirit to carry provision to the prophet Daniel. To this objection it is answered, that there were two Habakkuks; one, who was the prophet in the time of Manasses, and of the tribe of Simeon; and another, mentioned in this passage of Daniel, of the tribe of Levi. Against this history it has also been objected, that it relates the confinement of Daniel in the lion's den to have lasted six days, whereas in chap. vi. 5. 22, it is said, that he had been confined only one night. The advocates of the history reply, that he was twice cast into the lion's den; under Darius, because he prayed to God against the king's commandment; and under Cyrus, on account of the dragon. Dupin's Canon. b. i. c. 3. § 21. See Apocrypha, and Daniel.

BELA, in *Geography*, a pretty large town of Upper Hungary, seated in a delightful plain, not far from the river Popper, but much reduced by frequent fires.

Bela, or Bayla, a town of Africa, in the kingdom of Sennaar, near the river Rhad, or Rahad, between Dender and Teawa, in the route from Sennaar to Gondar.

Bela-Banya, i. e. "the white mine," *Dilo*, formerly *Fehr-Banya*, a mean town of Lower Hungary, in the Schemnitz district, and gepanschaft of Hont, whose mines being exhausted, the inhabitants applied themselves to tillage.

BELABRE, a town of France, in the department of the Indre, and chief place of a canton, in the district of Le Blanc en Berry, 2 leagues south-east of Le Blanc, and 8½ south-west of Chateauroux. N. lat. 46° 53'. E. long. 1° 3'.

BELALCAZAN, a town of Spain, in the province of Andalusia, on the frontiers of Estremadura, 9 leagues from Cordova.

BELAN. See Below.

BELANCE Island, in *Geography*, one of the small islets or rocks which lie between the island of Ushant and St. Matthew's point, at the entrance into the Brest harbour.

BELASAMA, formed from *bel-is-ama*, the mouth of a river, in *Ancient Geography*, the name given by Ptolemy to the bay near Liverpool, at the mouth of the river Mersey.

BELASI, in *Geography*, a town of Germany, in the Tyrolese, 8 miles west of Bolzano.

BELATUCADRUS, or Belatucardus, the name of an ancient British idol, recorded in several old inscriptions, and supposed by Selden (de Diis Syris) and Vossius (de Orig. & Prog. Idol. l. 2. c. 17. to be the same with Belenus, which see. Bishop Lyttelton and professor Ward supposed him to have been a local deity (see Archæologia, vol. i. p. 308.) with a special reference to Apollo, who was worshipped, as they observe, by the Druids. Mr. Pegge, (Id. vol. iii. art. 14.) contends, that it is highly absurd to look out for any other deity in Belatucardus, but the god Mars. This ingenious antiquary acknowledges, that he was a local deity, peculiar in this island to the Brigantes, but at the same time asserts, that he was equivalent to Mars, and that he was invested with the same powers as that god, and that he had not the least concern with Apollo, or any relation to him. The opinion of Mr. Pegge is approved and confirmed by Mr. Gough. (Id. vol. x.) We may add, that it is rendered unquestionable by the inscription recorded by Muratori (Inscrip. Thes. 43. 1.) which is as follows: "Deo Marti, Belatucadro."

BELAY, on board of *Ship*, signifies the same as fasten. Thus they say, belay the sheet or tack, that is, fasten it to the kevel, by winding it several times round a last, &c.

BELAYE, in *Geography*, a town of France, in the department of the Lot, and chief place of a canton, in the district of Lauzerte, one league south-east of Puy l'Eveque.

BELAYING-Cleats, in *Naval Language*, are pieces of wood, which have two arms, or horns, and are nailed through the middle to the masts, or elsewhere, for the purpose of belaying ropes to them.

Belaying-Pins, are turned wooden pins, with a shoulder near the middle: the small end is driven through the rough tree rails, or racks of thin plank made on purpose. Their use is for belaying ropes to them. Iron belaying pins are round, taper from the middle to each end, and are driven in the rails, or racks, to belay the ropes to, by taking several cross turns about them.

BELBA, in *Geography*, a town of Egypt, on the coast of the Mediterranean, 19 miles east of Tineh.

BELBEIS, a town of Egypt, about 35 miles north-east of Cairo, and 45 north-west of Suez. N. lat. 30° 22'. E. long. 31° 55'.

BELBEK, a river of the Crimea, which falls into the Euxine.

BELBINA, in *Ancient Geography*, an island of Greece, in the Saronic gulf, near the promontory of Sanium, and opposite to the Scyllæan promontory: mentioned by Pliny, Strabo, &c.—Also, a town of the Peloponnesus, in Laconia, near which was a temple of Minerva.

BELBO, in *Geography*, a river of Italy, which rises about 2 miles east of Ceva, and runs into the Tanaro, six miles S.W. of Alexandria.

BELBUCH, a town of Germany, in the circle of Upper Saxony, in Pomerania, one mile N.E. of New Treptow.

Belbuch, and *Zeomeluch*, in *Mythology*, were regarded among the Vandals as the good and evil genii. The former signified the white god, and the latter the black god. They were objects of divine honours.

BELCA, in *Ancient Geography*, a place of ancient Gaul, between Brivodbrum and Genabum, where was an amphitheatre.

BELCAIRE, in *Geography*, a town of France, in the department of the Aude, and chief place of a canton, in the district of Limoux, 3½ leagues S. W. of Quillan. The place contains 915, and the canton 6757 inhabitants; the territory includes 227½ kiliometres and 17 communes.

BELCANIA, a town of Asia, placed by Ptolemy in the greater Armenia.

BELCASTRO, a small episcopal city of Naples, in the province of Calabria Ultra; 10 miles N. E. of St. Severina.

BELCHER, a township of America, in the county of Hampshire, and state of Massachusetts, containing 1485 inhabitants, who subsist chiefly by farming.

BELCHERS, a cluster of islands in Hudson's bay. N. lat. 56° 10'. W. long. 80° 33'.

BELCHIER, John, in *Biography*, a surgeon of eminence in London, was born at Kingston-on-the-Thames in

1706. After receiving a classical education at Eton, he became pupil to Mr. Chefeldon, by whom he was much esteemed. In 1736, he was elected surgeon to Guy's hospital, and soon after fellow of the Royal Society. The following year, he sent to the society the case of a woman who died of a dropsy of the ovarium, attended with some remarkable circumstances, and soon after, an account of the case of a man whose arm had been torn off at the shoulder, by one of the ropes of a mill. The circumstance most deserving attention in this case was, that only a small quantity of blood was lost by the accident, which Belchier very properly attributed to the great distension the arteries had sustained before the limb was separated from the body. The man recovered. His next, and last communication to the society, was the result of a series of experiments and observations on the effect produced on animals, by mixing madder with their food. After continuing this diet for a few days, on killing the animals, the bones were found to be tinged with the madder, but on suffering some of them, that had been so fed, to live a few days longer, the colour induced by the madder became dilute and pale, and at length totally disappeared; a proof, it was observed, that the bones are well supplied with absorbents, as well as with blood vessels. See Philosophical Transactions. Nos. 423, 442, and 449. Belchier died in 1785, in the 80th year of his age, having for several years previously retired from business, and was buried in the chapel of Guy's hospital, to which he had been a zealous friend and patron. Gen. Biog. Dict.

BELCHING. See Ructation.

BELCHITE, in *Geography*, a small town of Spain, in the country of Arragon, seated in a fruitful soil, on the river Almonazir; 8 leagues south from Saragossa. N. lat. 41° 19′. W. long. 0° 30′.

BELCIANA, in *Ancient Geography*, a town of Asia, in Assyria. Ptolemy.

BELDEK, in *Geography*, a town of Hungary, 15 miles south of Zatmor.

BELDIRAN, a town of Asiatic Turkey, in the province of Caramania, 28 miles south of Cogni.

BELEBEV, or Belebeief, a town of Russia, in the government of Ufa, on the rivulet falling into the Diema, 60 miles south-west of Ufa. N. lat. 54°. E. long. 54° 14′. This is also the name of one of the nine districts, comprehended by the province of Ufa.

BELEKIS, a town of Sclavonia, 10 miles north-west of Belgrade.

BELEM, a town of Portugal, in the province of Estremadura, or in the vicinity of Lisbon, on the north side of the Tagus, in which are a considerable monastery and a royal palace. In its magnificent church, which suddenly sunk in 1756, many kings and princes of the blood have been interred. Below Belem is a square tower called "Torre de Belem," fortified with cannon, which no vessel must pass till it has been visited. Near this tower, which is near a league west from the city of Lisbon, in N. lat. 38° 40′. W. long. 9° 40′, are several batteries, and a small irregular fort, commonly called San Giao, built on a rocky point, and covering the entrance of the harbour, and opposite to it is another tower called "Torre velha," or old tower, strengthened by a few cannon and soldiers.

Belem, a town of North America, in the country of New Navarre, 180 miles north-west of Cinaloa.

Belem, Bellem, or Belm, a town and district of Germany, in the circle of Westphalia, bishopric of Osnabruck, and prefecturate of Iburg; 3 miles east of Osnabruck.

Belem, or Para, a sea-port town of South America, in the country of Brazil, seated at the north head of the river Guama, which falls into the river of the Amazons. See Para.

Belem *Cape*, a high steep point, on the coast of Gallicia, in Spain, about N.N.E. from cape Finisterre, between which is the projecting point of cape de Toriane, bearing south-west four leagues from Belem. The principal rock of this rugged point, appearing like a black tower, is called the Monk, or Munich.

BELEMNITA, in *Natural History*, a species of Nautilus, in the *testacea* order of *vermes*, with an uniform, smooth, conic, and acute shell, frequent among the fossils of Europe. See the next article.

BELEMNITE, or Thunderstone, *Pfeilstein*, *Donnerstein*, Germ. *Belemnite*, *pierre de foudre*, *Dactyle*, Fr. *Belemnita*, *Lapis Lyncurius*, *Idæus Dactylus*, *Lapis Ceraunius*, Lat.

The belemnite is a fossil, which has obtained its name from the Greek Βελος, an arrow, on account of its resemblance to an arrow-head. Its lengthened conical or spindle-shaped figure suggested a likeness to the finger, hence the name dactylus. The ignorant superstition of some of the ancients attributed the origin of this substance to the congealed urine of the Lynx, on account of its strong smell when pounded or scraped; by others it was supposed to be one of the materials of the thunderbolt, and it has derived names from both these circumstances.

The form of the belemnite is generally intermediate between a long cylinder and a very acute-angled cone; the apex is a plain rounded point; the base is somewhat concave: at a distance between the base and apex, varying in length from one-third to one-sixth of the whole, the diameter of this fossil begins to increase towards the base in a considerably greater ratio than it did from the apex; the most correct idea, therefore, of its figure, will be formed by imagining a truncated cone terminated by another much longer and more acute-angled, rounded off at the extremity instead of coming to a sharp point. It is by no means common, however, to find belemnites thus perfect, being for the most part broken off at one extremity, and not unfrequently at both. Considerable variations are observed in the form of this fossil: it is sometimes expanded and somewhat flattened at the extremity, or is nearly cylindrical, or enlarged and rounded off at the apex, so as to resemble a club. In the flattened varieties a longitudinal furrow on each side is occasionally observed. The colour of the belemnite is generally brownish yellow, with a transparency resembling alabaster. It usually consists of calcareous spar, mingled however with animal matter; for when exposed to a red heat it gives out an odour like burnt horn: sometimes it occurs converted into flint, at other times is found filled with pyrites, or even according to Volkmann, (Silesia Subterran. § 155.) with galena.

If a longitudinal section is made of a perfect belemnite, it will appear to be composed, like a cow's horn, of a number of elongated conical lamellæ inserted one into the other, covering a core or alveolus, also of a conical shape, but extending never more than a third of the length from the base towards the apex. A cross fracture of this fossil beyond the alveolus exhibits a number of rays converging from the circumference towards the centre, and as many concentric circles as there are conical lamellæ.

The alveolus of the belemnite is a conical body, divided transversely into cells by bony parietes resembling watchglasses; the centre of each of which, according to Platt, Rosinus, Sage, &c. is perforated to receive a tube or siphunculus, which passes from the apex to the base of the alveolus, and thus communicates with all the cells, in the same manner as is observable in the nautilus, the ammonite, and orthoceratite:

tite: it is remarkable, however, that Deluc (Journal de Physiq. vol. lii. p. 360.) altogether denies the existence of this perforation. Every paries in the alveolus serves as the base of a conoidal lamina; the number of these last, therefore, is equal to that of the cells of the alveolus.

It often happens that the alveolus of the belemnite is found detached from the other part of the fossil, and in this state it has been considered as a peculiar species of orthoceratite; while the conoidal case, deprived of this characteristic part, has been supposed to be a mere stalactite, or a petrified tooth of the grampus, or a spine of a species of echinus, or even of vegetable origin.

M. Deluc, denying the perforation of the alveolus, considers the belemnite as a bone belonging to an unknown animal analogous to the sepia, or cuttle-fish, apparently, however, without much reason.

The belemnite has never been met with but in a fossil state; it occurs not unfrequently in marble, limestone, and chalk strata, together with other marine remains; and detached fragments are often found in the gravel beds that cover or adjoin these strata.

The finest English specimens have been procured from the chalk pits of Oxfordshire; the quarries of Meudon near Paris contain many perfect and beautiful varieties; but the largest specimens come from the Margravate of Anspach in Prussia. Philos. Trans. for 1764. Journ. de Physique, vols. li. lii. liii. Schröter's Lithologisches real und Verballerikon, &c. vol. i.

BELENUS, or Belinus, in *Mythology*, a name which the Gauls gave to the sun, which they also called *Mithra*; and as some suppose the same with the *Baal* of Scripture, and the *Belus* of the Assyrians.

Belenus, latinized by the Roman authors, according to Toland, ubi infra from "Beal" or "Bealan," was understood by the Gauls and their colonies to denote the sun; and according to J. Capitolinus (Maximin. c. 22.) and Herodian (l. 8. c. 3.) he was the same deity with the Apollo of the Greeks and Romans. He was actually denominated Apollo in the inscriptions found at Aquileia, where he was honoured with a peculiar worship, under the figure of a young man without beard, with rays about his head, and an open wide mouth for uttering oracles. Tertullian (Apolog. c. 23.), informs us, that Belenus was the idol-deity of the Noreci, a people among the Illyrians, Vopiscus says (Aurelian apud init.) his forms and ornaments were the same with those of the Mithra of the Orientals. The sun, indeed, seems to have been the most ancient and universal object of idolatrous worship; insomuch that perhaps there never was any nation of idolaters which did not pay some kind of homage to this glorious luminary. Accordingly, he was worshipped by the Gauls and ancient Britons with great devotion under the various appellations of Bel, Belenus, Apollo, Grannus, &c. names which in their language were expressive of the nature and properties of that visible fountain of light and heat. To this illustrious worship, those famous circles of stones, called cairns, or carns, of which there are not a few still remaining, seem to have been chiefly dedicated; where the Druids kept the sacred fire, the symbol of this divinity, and from whence, as they were seated on eminences, they had a full view of the heavenly bodies. The first day of May was, in the Druidical rites of worship, a great annual festival in honour of Belenus, or the sun. On this day prodigious fires were kindled in all their sacred places, and on the tops of all their cairns, and many sacrifices were offered to that glorious luminary, which now began to shine upon them with great warmth and lustre. Of this festival there are still some vestiges remaining, both in Ireland and in the highlands of Scotland, where the first of May, is called "Beltein," i. e. the fire of Bel or Belinus. Two such fires, says Toland, were kindled near one another on May-eve in every village of the nation, as well throughout Gaul, as in Britain, Ireland, and the adjoining lesser islands, between which fires the men and beasts to be sacrificed were to pass; from whence came the proverb "between Bel's two fires," meaning a person in a great strait, not knowing how to extricate himself. One of the fires was on the cairn; the other on the ground. On the eve of the first day of November there were also such fires kindled, accompanied with sacrifices and feasting. All the people of the country on this eve extinguished their own fires entirely; and every master of a family was religiously obliged to take a portion of the consecrated fire home, and to kindle the fire anew in his house, which for the ensuing year was to be prosperous. The Celtic nations also kindled other fires on Midsummer eve, which are still continued, says Toland, by the Roman catholics of Ireland, making them in all their grounds, and carrying flaming brands about their corn-fields. This is done likewise in France, and in some of the Scottish isles. These Midsummer fires and sacrifices were intended for obtaining a blessing on the fruits of the earth, now ready for gathering; as those of the first of May, that they might prosperously grow; and those of the last of October were a thanksgiving for finishing their harvest. But in all of them regard was had to the several degrees of increase and decrease in the heat of the sun. Toland's Hist. Druids in his Works, vol. i. p. 69, &c. Henry's Hist. vol. i. p. 156, &c.

BELERIUM, (Diod. Sic. l. v. c. 22.) or Bolerium, (Ptolem. l. ii. c. 3.) called also by Ptolemy "Antivestæum" in *Ancient Geography*, is the promontory formed by the most western point of Britain, now known by the name of "Land's End."

BELESME, in *Geography*, a town of France in the department of the Orne, and chief place of a canton in the district of Mortagne, 3 leagues S. from it. The place contains 2708 and the canton 13,022 inhabitants; the territory includes 170 kiliometres and 15 communes.

BELESTA, or Belestat, a town of France, in the department of the Aude, and chief place of a canton, in the district of Quillan, 10 miles west of Quillan.

BELETTE, in *Zoology*, a name under which Buffon describes the common weesel, *mustella æstiva* of Gmelin.

BELEZ, in *Geography*, a town of South America, in Terra Firma, and province of New Grenada.—Also, a river of Spain, which runs into the Mediterranean, between Barcelona and Taragona.

BELFAST, a considerable town of Ireland, in the county of Antrim, and province of Ulster, situate at the mouth of the river Lagan, which separates it from the county of Down. The town, except a small portion of it, is not elevated more than six feet above high water mark at spring tides. Belfast lough, or the bay of Carrickfergus, into which the Lagan flows, is a spacious æstuary, a great part of which is left dry every tide, which is the case likewise with Strangford lough, another great æstuary, the nearest extremity of which is distant about 8 miles S.E. Between Belfast and Lough Neagh, which is about 12 miles west of it, there is a chain of mountains, the highest of which, called Devis, is about 1580 feet high. The roots of these mountains extend to the neighbourhood of the town. Mr. Arthur Young found them to consist of very good loam to their summits, and complains of their being neglected. As tillage, however, is improving in that neighbourhood, it may be supposed that there is no longer cause for such complaint. There was formerly a castle at Belfast, which seems to have been a post of importance, as it was twice taken and destroyed by the earl of Kildare, lord

lord deputy, in 1503 and 1512. After the complete reduction of Ireland at the beginning of the 17th century, Belfast became the property of Sir Arthur Chichester, afterwards lord deputy, and baron of Belfast, who exerted himself in the settlement of Ulster. Through his influence it was made a borough, and sent two members to the Irish parliament; and an English gentleman, who travelled through part of Ireland in 1635, and whose manuscript journal is in the possession of general Vallancey, mentions that lord Chichester had a stately palace at Belfast, which was the glory and beauty of the town, and which was his chief residence. Through the influence of this nobleman, the custom-house was removed from Carrickfergus to Belfast by the earl of Strafford in 1638, for which a compensation of 2000l. was paid to the corporation of Carrickfergus. In 1648, Belfast was taken possession of by colonel (afterwards the celebrated general) Monk, for the parliament of England. So late as 1726, when Boate's Natural History of Ireland was re-published by Dr. Molyneux, it was a small place of little consequence. But situated in the centre of a populous and industrious country, it has since become one of the most interesting objects in Ireland to the political economist. The town is well-built, mostly of brick, and the streets are broad and straight. The bridge over the Lagan is 2560 feet long with 21 arches; it was built about the time of the revolution, at the joint expence of the counties of Antrim and Down, and cost 12,000l. Eighteen of the arches are in the former, and three in the latter county. With regard to size it is the fifth, and with respect to commerce, is generally reckoned the third town in Ireland, being next to Dublin and Cork. Vessels of 200 tons half loaded used to come to the quay, there being about ten feet water at spring tides, but now the water at the quays is from nine to thirteen feet deep according to the time of the moon, having been deepened by the exertions of the ballast corporation. Vessels which cannot come to the quays lie two miles and a half below the town, where there is very good anchorage. The West India trade was considerable before the late war, and has revived since the restoration of peace. The trade in pork and butter has increased very much of late years; and also the American trade. The export of linen both to England and America is very considerable. In 1775, the gross custom, according to Mr. Young, amounted only to 64,800l. including the excise upon tobacco and foreign spirits. In 1797, it amounted to 87,016l. 6s. 2d. In the following year it decreased on account of the disturbed state of the country, but it has since gradually risen; and in the year ending 5th April 1802, amounted to 246,89cl. 9s. 4½d. The excise of Belfast in 1796 was only 9097l. 13s. 2½d. but previous to the stoppage of the distilleries it had risen to 22,165l. 3s. 6d. exclusive of Carrickfergus and Templepatrick, which walks are included in the same district. The duty on licences in 1801, amounted to 4309l. Though the increase, as in other places, must be partly attributed to the increase of duties, yet the extension of trade must also have been considerable. The population of Belfast was taken at different periods by a gentleman who filled the office of high constable: but not officially. In 1782, the number of inhabitants appeared to be 13,105, and in 1791, 18,320, exclusive of 1,208 in Ballymacarret, the suburbs on the Down side of the river Lagan. There were in 1791, 695 looms, of which 522 were employed in the cotton manufacture, 129 in that of cambrick and linen, 28 of sailcloth, and 16 of stockings. There are also manufactories of glass, sugar, and earthen-ware. The public buildings are not many; the linen hall is large and commodious, and there is a good assembly-room over the Exchange. There is a barrack which contains about 800 men. The church is a handsome structure, but is too small for the parish. Other places of worship are, four presbyterian meeting-houses, one Seceding, and one Methodist meeting house, and one Roman Catholic chapel. The charitable institutions are, a poor-house and infirmary, which maintains and clothes 300 of various ages, and is conducted on the same plan as the Dublin house of industry; a fever-hospital, a dispensary, a lying in hospital, a charity-school for boarding girls, a day-school for boys and girls, a Sunday-School, and a School of industry for the blind, none of them very extensive, but sufficiently so for such an industrious country. It is probable that the Hamburgh plan, described by Mr. Voght, from which such unspeakable benefit has been derived, would succeed better in Belfast than in any other town of Ireland, and from the public spirit and active disposition of the inhabitants, it would, without doubt, be well attended to. In such a town as Belfast, many commercial institutions might be expected; and we accordingly find a chamber of commerce, a ballast office corporation, two insurance offices, &c. There are also a library society, under the title of the *Belfast Society for Promoting Knowledge:* and a literary society, lately established on a plan similar to that of other societies for philosophical and literary purposes. An academy for the education of the higher class in this town, was founded by the inhabitants in 1786, and has been hitherto under the care of a presbyterian minister, but the advantages of it are not confined to any sect. Belfast is situated 80 miles north of Dublin, and sends one member to the imperial legislature. W. long. 5° 49′. N. lat. 54° 43′. Variation W. August 8th, 1789, 11° 15′ P. M. 26° 20′. Arthur Young's Tour. Dr. Beaufort's Memoir, &c. &c.

BELFAST, a township and bay of America, in Hancock county and district of Maine, both situate in the Waldo Patent, at the mouth of Penobscot river, and on its western side, 38 miles N. E. by E. from Hallowell, and 246 N. E. from Boston. The town contains 245 inhabitants. The bay, on the north-western part of which the town stands, runs up into the land by three short arms. In the middle of it lies Isleborough island, which forms two channels leading to the mouth of Penobscot river.

BELFORD, a market town of Northumberland, England, is seated on the great post road from London to Edinburgh, at the distance of 322 miles from the former. This town, though small, is particularly neat, and its houses are ranged on the ridge of a hill, which commands a view of the North sea. The church was built in 1700; near it are the ruins of an old chapel, and at a short distance are the foss and vallum of an ancient encampment. Here are a weekly market on Tuesdays, and two annual fairs. The number of houses in the township is 161, and of inhabitants 902.

About four miles east from Belford, is Bamborough castle, the origin of which is attributed to king Ida, who began his reign about the year 559. The present remains are considerable, and appear to be wholly the relics of Norman architecture, though our historians are decidedly of opinion that they occupy the site of a Saxon fortress or palace. This was besieged in the year 642, by Penda, the Pagan king of the Mercians, but without success. In the year 710, king Osred, on the death of Alfred his father, sought refuge here, with Brithric, his tutor or guardian, and after a gallant defence, repulsed Edulph and his partizans. In the reign of Egbert, this castle was made the prison of Kenulph, bishop of Lindisfarm, who was confined here from 750 to 780. In many subsequent periods, it was the scene of repeated sieges, and suffered successively by the Danes, by the Normans, and by the Yorkists.

BELFORTE, a town of Italy, in the duchy of Parma, 19 miles S.S.W. of Parma.

BELFRY, Belfredus, is used by military writers of the middle age for a fort of tower, erected by besiegers to overlook and command the place besieged.

They were all called *berfredi*, *berefredi*, *verfredi*, and *belfragia*. Their structure and use are described in verse by a poet of those days.

Belfry originally denoted a high tower, whereon centinels were placed to watch the avenues of a place, and prevent surprize from parties of the enemies, or to give notice of fires by ringing a bell. Du-Cange.

In the cities of Flanders, where there is no belfry on purpose, the tower of the chief church serves the same end. The word belfry is compounded of the Teutonic "bell" and "fried," *peace*, because the bells were hung for preserving the peace.

Belfry, is also used for that part of a steeple wherein the bells were hung. This is sometimes called by middle-aged writers *campanile*, *clocarium*, and *triflegum*. Du-Cange. This is sometimes used in *Heraldry* as a crest.

Belfry, is more particularly used for the timber-work, which sustains the bells in a steeple; or that wooden structure, to which the bells in church-steeples are fastened.

Belfry, *Great*, in *Ornithology*, the alarum thrush of Latham, and turdus tinniens of Gmelin, le grand beffroi of Buffon, is so called by this latter naturalist, from the singular sound which it makes in the evenings and mornings, and which resembles the din of an alarum bell. The succession of sounds is as rapid as the quick strokes of a bell, and continues about an hour. See Turdus Tinniens. The "small belfry," is the speckled thrush of Latham, and Turdus Lineatus of Gmelin, which see.

BELGÆ, in *Ancient Geography*, were Scythians or Goths, who, advancing from Asia, drove the Cimbri or northern Celts before them; and at a long period preceding the Christian æra seized on the north-west part of Gaul, where they acquired the provincial denomination of Belgæ; and from them the country which they inhabited obtained the name of Belgic Gaul. Writers are not agreed as to the etymology of this appellation. As they were a fierce, contentious, and warlike people, and disposed to domineer over all their neighbours, according to the character which Cæsar (Comment. l. ii. c. 4.) has given of them, some have supposed that they were called "Belgæ" on that account; the word "Belga" in the old Teutonic signifying "fierce" and "quarrelsome." Others have suggested, that the term "Belgæ" is synonymous with the Celtic "Belligheis," and that it signifies persons who inhabited the *high* or *northern* part. Others again have derived Belgæ from "Belgen" or "Velgen" signifying stranger. Some time after their settlement in Gaul, but at an unknown period, they penetrated into Britain; and accordingly when Cæsar first explored this island, he informs us (l. v. c. 10.) that the primitive inhabitants were driven into the interior parts, while the regions on the south-east were peopled by Belgic colonies. The Belgæ may, therefore, be justly reputed as the chief ancestors of the English nation. On the continent, the Belgæ having taken possession of part of Gaul, and being naturally a ferocious people, waged frequent wars with the Germans; so that these two nations continued in a state of hostility and friendship, sometimes invading each other's territories, and at other times assisting each other against the Romans. In the time of Cæsar, the Belgæ, alarmed at the success of the Romans in their expeditions against the Germans, formed a grand alliance with the Celtæ, Germans, and Gauls, in order to drive them farther from their neighbourhood. Cæsar, according to his usual manner, found means to sow such dissensions among them, that many of these allies submitted to him; however, the Nervii, Attrebates, and Veromandui, stood firm, and though at length defeated, it was one of the dearest victories which Cæsar had ever obtained; and, in consequence of this defeat, the whole Belgic nation was compelled to submit to the Roman yoke. The Belgæ of Britain were seated to the east of the Durotriges, on the same coast, and inhabited the counties now called Hampshire, Wiltshire, and Somersetshire. When Cæsar invaded Britain, some part of this country was possessed by the Segontiaci, whose chief town was Winchester, called by the Britons "Caer-seguent," from the name of these, its ancient inhabitants. But these people seem to have been soon after subdued by and incorporated with the Belgæ, as they are never afterwards mentioned. As to the first introduction of the Belgæ into Britain, history is silent; but with respect to some few of the latest colonies who settled here not very long before the Roman invasion, and who inhabited the south parts of Britain, Cæsar informs us, (l. v. c. 10.) "that the sea-coast of Britain is peopled with Belgians, drawn thither by the love of war and plunder." "These last (he says) passing over from different parts, and settling in the country, still retain the names of the several states from whence they were descended." The latest of these Belgic colonies came into Britain only a few years before Cæsar's invasion. This colony was conducted by Divitiacus, king of the Suessiones, one of the most powerful of the Belgic nations in Gaul; and having obtained a footing on the British coast, he continued to reign over the Belgæ in this island, as well as over his ancient subjects on the continent. In his continental territories, he was succeeded by Galba, and in his British dominions by another of his sons, perhaps Segonax, who attempted to destroy Cæsar's fleet. Although the Segontiaci submitted to Cæsar, we have no account of the submission of the Belgæ to that conqueror. The honour of subduing that British nation was reserved to Vespasian, who, landing an army in these parts, A. D. 49, fought 32 battles, took more than 20 towns, subdued two very powerful nations, one of which was the Belgæ, and the isle of Wight. After this time, the country of the Belgæ was much frequented by the Romans, who made in it many excellent military ways, and built several beautiful towns, which are mentioned by both Ptolemy and Antoninus. The most remarkable of these towns were Venta Belgarum, Winchester, famous for the imperial weavery which was there established, and Aquæ Solis, Bath, even then renowned for its warm and salutary springs. The country of the Belgæ was included in the Roman province, called Flavia Cæsariensis, and governed by the president of that province, and his inferior officers. Henry's Hist. vol. i. p. 246, &c.

BELGARD, or Belgrad, in *Geography*, a town of Germany, in the circle of Upper Saxony, and chief place of a circle to which it gives name, in the duchy of Pomerania, seated on the Persante, and noted for its market for horses. It was a place of some distinction as early as the 11th century, for its strength and for the number and valour of its inhabitants; but it has suffered much by fire and by war; particularly by the 30 years' war. By the treaty of Westphalia, it devolved to the house of Brandenburgh. It has a castle and a provostship, and is the seat of a royal bailliage. N. lat. 54° 10′. E. long. 16° 51′.

BELGERN, a town of Germany, in the circle of Upper Saxony, and margraviate of Meissen, seated on the river Elbe, 36 miles N. W. of Dresden, and 24 N. W. of Meissen.

BELGERS, a town of Asiatic Turkey, in the province of Caramania, 78 miles west of Cogni.

BELGEVAN, a town of Asia, in Tartary, in the kingdom of Bucharia, and province of Catland.

BELGICA, in *Conchology*, a species of Sabella, very briefly

briefly described by Gmelin, as having a conic shell "testa conica;" and is said to be found on the shores of Holland.—Obs. This is supposed by some to be the sabella granulata of Linnæus, and tubiformis of Pennant; but it is by no means certain that even the two last are of the same species: we think they are not; and it may admit of equal doubt whether either of them be the species Gmelin describes as belgica. The last mentioned author seems to be under no small difficulty in this respect himself, for he entirely omits taking the slightest notice of either as species, or even amongst his synonyms. Sabella tubiformis of Pennant is undoubtedly different from sabella belgica of Gmelin, according to Klein and Martini, to which he refers. Vide Donov. Brit. Shells, pl. 133.

Belgica, in *Ornithology*, a species of Scolopax, with a very straight bill, black at the tip: head, neck, and breast ferruginous: abdomen white; back, wings, tail, and legs black. Nozem. nederl Vogel. t. 27. A native of Holland, and feeds on worms, &c.

Belgica Gallia, in *Ancient Geography*, one of Cæsar's three divisions of Gaul, or Gallia, the other two being Aquitania, and Celtica, or Gallia propria. Gallia Belgica was bounded by the ocean to the north, by the Sequani (Seine) and Matrona (Marne) to the west, by the Rhine to the east, and to the south by various limits, at different times. Cæsar appropriated the Sequani and the Helvetii to that part of Gallia Celtica which was afterwards called "Lugdunensis." But Augustus, when he made a new partition of the provinces, transferred the Sequani and Helvetii to Gallia Belgica. According to the distribution of Ptolemy, Gallia comprehended four parts, viz. Aquitania, Lugdunensis, Belgica, and Narbonnensis. See Gallia. Mentelle, in the Encyclopedie Methodique, divides Gallia Belgica into Belgica prima, comprehending the Treviri, Mediomatrici, Verdunenses, and Leuci; and Belgica secunda, including the Nervii, Morini, Ambiani, Bellovaci, Silvanectes, Vadicasses, Suessiones, Veromandui, Attrebates, Remi, and Catalauni. The capital of the Treveri, viz. Augusta or Treveri, was the metropolis of Belgica prima. Belgica secunda contained a great number of cities, and comprehended Lorraine and Champagne; whilst Belgica Prima contained a portion of the isle of France, Picardy, and Artois. Belgic Gaul comprehended those provinces of the Netherlands now called the Belgic provinces, which were formerly subject to the house of Austria, but which have been recently annexed to the French dominions. See Netherlands.

Belgica, *Balchuysen*, a village of Gallia Belgica, in the country of the Ubii, between the rivers Rhone and Roer, 8 miles from Marcomagum, according to the itinerary of Antonin, in Germania secunda, or Inferior, south-west of Colonia Agrippina.

BELGINUM, Bingen, or Baldenau, a place of Germania prima, or Superior, a province of Gaul, at some distance to the east of Augusta Trevirorum.

BELGIUM, a canton of Gallia Belgica, from which it is distinguished by Cæsar (l. v. c. 24.) as a part from the whole; to this canton he assigns the Bellovaci, to whom Hirtius (l. viii. c. 46 and 47.) adds the Attrebates. And as the Ambiani were seated between the Bellovaci and Attrebates, these also must be included in Belgium, which must have extended to the sea. These three people, says Cellarius, were the proper and genuine Belgæ, all the rest being adventitious, or foreigners. See Ambiani, Atrebatii, and Bellovaci.

BELGIUS, a river of Africa in Libya. Hesychius.

BELGNÆA, a town of Arabia Deserta. Ptolemy.

BELGOROD, in *Geography*. See Bielgorod, and Akerman.

BELGRADE, Alba Græcorum, a town of European Turkey, the capital of Servia, seated on the side of a hill, at the conflux of the Save and the Danube. It was formerly a very strong place, but is now destitute of fortifications, and it was accounted the barrier and key of Hungary, to which it was first annexed by the emperor Sigismund.

The number of inhabitants is now supposed to amount to about 25,000. The suburbs are extensive, and it has a great resort of Turkish, Jewish, Greek, Hungarian, Armenian, Austrian, and Sclavonian merchants. The streets, in which the chief trade is carried on, are covered with wood, as a shelter from the sun and rain; the shops are small, and the commodities that are sold are conveyed out of a window, as the buyers never enter them; the richest merchandize is exposed to sale in two bazars that cross each other; and there are two exchanges constructed with stone, and supported by pillars. There are likewise at Belgrade a caravansera, or public inn, and a college for young students. Its situation near the rivers renders it convenient for commerce; and as the Danube falls into the Black sea, and affords a passage to Vienna, trade is easily extended to distant countries, so that Belgrade is a staple town in these parts. The Armenians and Jews are employed as factors; the former have a church, and the latter a synagogue in this place. In the environs of Belgrade are several small villages near one another, and almost all of them inhabited by Greeks. The fields present some degree of culture; and the whole adjacent country affords fine cluster or stalk-fruited oaks (quercus racemosa, Lamarck) whose wood is very hard and very fit for ship-building. Some few vineyards and gardens are to be seen in the vicinity of Belgrade. The aqueducts, constructed by the emperors of the east for conveying water to Constantinople, attract admiration. See Aquæduct. N. lat. 45° 10′. E. long. 21° 12′.

The possession of Belgrade has been repeatedly disputed between the Austrians and Turks. In 1521, it was taken by the Turks, after having been attacked in vain by Amurath II. in the preceding century, but recovered by the Imperial army in 1688. In 1690, it fell again under the Turkish yoke, from which the Austrians unsuccessfully attempted to regain it in 1693. By the treaty of Carlowitz in 1699, the Turks remained in possession of it; but in 1716, it was besieged by prince Eugene, and after a severe contest it was compelled to surrender to the Imperial arms.

Belgrade is chiefly famous in the history of military operations on account of the battle fought in its vicinity in the year 1717, the result of which was the last great victory obtained under the auspices of the celebrated prince Eugene, and which decided the event of the war then depending between the German and Ottoman empires.

The Turks, notwithstanding the losses they had sustained during the campaign of 1716, determined to make the most vigorous efforts for the preservation of their Hungarian acquisitions. The imperialists were equally desirous of terminating the war by some important action. Prince Eugene, having concentrated the Austrian forces in the bannat, on the 15th of June effected the passage of the Danube in boats with 30,000 of his troops without the loss of a man, in presence of some Turkish corps stationed on the southern bank, who, without attempting an opposition, threw themselves into Belgrade. A bridge of boats was immediately constructed for the passage of the rest of the army, the horse, and artillery, and by the 19th of the same month, Belgrade was completely invested.

The first care of prince Eugene, who foresaw that the Turks would venture a battle to relieve the place, was to fortify his camp in such a manner as might enable him to cope

cope with an army much superior in number to his own. He accordingly began to cast up lines of circumvallation and contravallation, strengthening them with entrenchments, redoubts, and other field works of the necessary description. Within these lines the army encamped to the south of Belgrade; its front towards the open country, its left resting upon the Danube; its right extending towards the Save. A bridge of boats was thrown across the latter river, and, as well as that already constructed on the Danube, secured by strong *têtes de pont*. The line of contravallation, looking towards Semedria, consisted of a ditch, sixteen feet wide, of proportionable depth, and defended by a strong parapet. The proper openings were left for the troops to issue and form in order of battle without confusion, covered in front by ravelins and redans; and upon the right, a large *fleche*, or redoubt, was erected for the purpose of commanding a hollow ground, which the Turks might otherwise have found serviceable in their approaches. The field pieces of all the different battalions, planted at regular distances along the front of the contravallation, secured it from any sudden insult. As, however, the army was not sufficiently numerous to occupy the whole extent of ground between the two rivers, cross entrenchments were formed, connecting the principal lines on the right and left, and still preserving a communication with the different bridges.

As the Turkish garrison consisted of between twenty and thirty thousand regular troops, and had also a strong flotilla on the Danube, prince Eugene found it absolutely necessary to maintain two flying camps: one of several thousand men at Semlin, to keep up a communication with Peterwaradin, from whence the Imperialists derived their supplies of provisions, under Count de Hauben; and another of five battalions and some cavalry to cover the head of the bridge over the Danube. Four ships of war protected the navigation of that river, and watched the motions of the Turkish flotilla. But a violent storm which happened on the 13th of July, had nearly rendered abortive the projects of the besiegers. The bridges of the Danube and Save were broken by the force of the tempest. Several vessels, detached from the rest, were carried floating at random down the stream, and the Turks took advantage of this accident to make a sally across the Save, and attack the redoubt which covered the head of the bridge. The gallant defence of a captain and 64 men, who alone garrisoned the post, preserved it, together with that part of the bridge which remained on the north side of the river, from falling into the hands of the enemy. To prevent such sorties in future, the camp of Semlin was strongly reinforced, and the command entrusted to count Martigny. More serious operations commenced; and during the night of the 18th, trenches were opened against Belgrade to the north of the Save by 1,200 pioneers, covered by a large detachment under general Marsigli. The Turks, however, the following morning, opened a dreadful fire upon them from all the batteries of the place, the flotilla on the Danube, and the islands in that river, and making a sortie with 4000 men in boats, assaulted so furiously the guard of the trenches, that if prince Eugene had not animated the troops by his personal presence and bravery, in repulsing the attack, a total defeat must have ensued. As it was, general Marsigli, with twenty other officers of note, and 400 soldiers, perished in this affair. It became necessary to augment the guard of the trenches to nine battalions, and construct new lines. In six days a complete chain of works was established from the bridge along the Save to its influx with the Danube, and from thence ascending the course of the latter river to the camp of Semlin, defended with redoubts, and well provided with artillery: insomuch, that from the moment of their completion, the garrison attempted no farther sallies.

On the 23d of July, the cannonade and bombardment commenced from all the Austrian batteries, with dreadful effect, and by the 30th, Belgrade resembled, towards the water, a heap of ruins. But the excellent state of their fortifications on the side of the besieging camp, and expectations of approaching succours, animated the garrison to maintain a most vigorous resistance. Their expectations were not delusive. The grand vizier, having drained the Turkish provinces of soldiers to complete his army, had already began his march, and on the 28th his advanced parties appeared in sight, and began to skirmish with the Austrian out-posts. The number of these marauders daily increased, and on the last of July, the vizir with his whole army arrived in presence of the Imperialists. But instead of attacking prince Eugene as the latter expected, he encamped upon the heights above the Austrian camp with all his forces, supporting his right flank by the Danube and stretching his left towards the Save. The following days were spent in preparing batteries, throwing up entrenchments, and making approaches against the works of the Imperialists, as if they had literally been a town besieged. Eugene found himself compelled, by this mode of attack, to adopt new dispositions. He instituted additional artillery on his own lines, defended all the avenues with chevaux de frize, mined the ground before the *fleche* already mentioned, and called in part of his troops from the opposite bank of the Save. Nevertheless, the Turks, pursuing their projected plan of operations, pushed their approaches in spite of the dreadful havock which the Austrian bombs and grenades incessantly made among them to within musket shot of the contravallation. Their army amounted to upwards of 200,000 men. Their works were mounted with 140 pieces of cannon and mortars. The garrison, who now sustained some respite from the fire of the Austrian batteries, directed their own upon the tents of the besiegers, and thus situated, between two hostile armies, who from their situation commanded more or less every part of his position, Eugene found himself enfiladed by the fire of upwards of 250 pieces of artillery. His situation became every day more precarious. The dysentery, which for the last month had done great mischief in his camp, now raged to such a degree that hundreds were buried in a day. A mortality prevailed among the horses, in consequence of which half of the cavalry were dismounted; and an army which, at the opening of the campaign, amounted to above 80,000 men, could not now muster 60,000 effective. Though no immediate scarcity of provisions or ammunition was experienced, yet the disappointment of the expectations prince Eugene had conceived, that the Turks would be obliged to retire for want of provisions, obliged him to determine without delay on some decisive measure; especially as the vizier had occupied an eminence adjoining the Save, with a considerable body of troops, and might, by sending 20 or 30,000 men across the river, have rendered a retreat, in case of defeat, impracticable to the Austrians. Under these circumstances, it was resolved, in a general council of war held on the 15th of August, to be beforehand with the enemy, by making a decisive attack on their camp. The detachments beyond the Save were immediately called in, except about 1,400 foot, and 300 horse. Seven regiments of cavalry and ten battalions with all the dismounted horse and dragoons, were left in the lines to observe the garrison. Eleven regiments of cavalry, commanded by field marshal count Palfi, and general count Merci, composed two lines on the right, and marched out before midnight. The left wing, consisting of 12 regi-

ments, marched out at the ſame time, commanded by general Montecuculi and Martigny. The infantry, under prince Alexander of Wirtemberg, in chief, was drawn up in the centre; the firſt line of 22 battalions, conducted by count Maximilian of Staremberg, and count Harrach; the ſecond, of 18 battalions, by the prince of Bevern. The corps de reſerve, with which marſhal Seckendorf remained in the lines, ready to act as occaſion ſhould require, was compoſed of nine battalions. The effective force of the two lines, on whom the ſucceſs of the day in a great meaſure depended, did not amount to more than 40,000 men; yet, notwithſtanding this immenſe inferiority, the confidence of the ſoldiers in their commander was ſuch, that they received the orders to prepare for action with the greateſt chearfulneſs, and marched out, as if inſpired with a certainty of victory.

At one in the morning the Imperialiſts, favoured by a thick fog, quitted their trenches: The right advancing towards the *fleche*, which was aſſigned as its point of formation, and the left over the open ground adjoining the Danube. Two hours were ſpent in making the neceſſary preparatory movements; but the fog, which had hitherto favoured the Imperialiſts, increaſed to ſuch a degree as to become productive of ſerious inconvenience. The right wing, miſſing its way, ſtumbled, inſtead of the *fleche*, upon one of the Turkiſh advanced works. The ſurpriſe was equal on both ſides; but a diſcharge which immediately opened upon the Auſtrian cavalry from the guard of the trenches, ſpread the alarm throughout the whole of the grand vizier's army. His troops haſtily ruſhed from every part of the camp towards the ſcene of action, and in a few minutes count Palſi became hotly engaged. The Auſtrians, formed in a hurry, and their battalions, through fear of loſing the ſupport of the cavalry, inclining ſucceſſively to the right flank, a wide vacancy was left in the centre, and afforded the Turks an advantage of which they did not fail to profit. Meantime, the combat, once engaged on the right, quickly commenced on the oppoſite flank. Prince Eugene had intended to begin the attack with both wings at the ſame time; but convinced by the heavy firing he heard towards the Save, that Palſi had already began the battle, he was himſelf obliged to come to blows, before the battalions of his left wing were completely formed. It was now between four and five o'clock in the morning. The fog continued ſo thick as to prevent the combatants from diſcerning each other, till they arrived almoſt cloſe to the muzzles of their adverſaries' pieces; and owing to this obſcurity ſeveral ſmall detachments of Auſtrians, whom a deſire to ſignalize themſelves carried unawares into the thickeſt of the enemy, were entirely cut off. The aſſailants nevertheleſs gained ground. As the darkneſs obliged them to march with their firelocks always preſented, the fire they poured in, the moment they perceived their enemies, was ſo cloſe, well directed, and did ſuch prodigious execution, that the Turkiſh battalions, as they advanced in ſucceſſion, were broken, diſmayed, and precipitated headlong into their trenches, where the bayonet and ſabre made dreadful havoc among them. The cavalry were not equally ſucceſsful; the broken nature of the ground obliged them to perform frequent evolutions in order to find ſome paſſages of eaſier acceſs, and the Turks, who lined the trenches, galled them with ſevere and inceſſant firings. The centre of the enemy's army too finding nothing to oppoſe them, threw ſeveral battalions into the void ſpace between the flanks of the Imperialiſts, and completely intercepting all communication, opened a heavy fire to right and left upon the divided forces. The battle, under the preſent circumſtances, ſeemed irrecoverably loſt, but the fog, at this critical moment clearing up, diſcovered to prince Eugene the diſpoſition of both armies, and his own perilous ſituation. The advance of the ſecond line prevented his total defeat. The prince of Bevern, who commanded it, marched up to the Turks, whoſe ſucceſs had thrown them into diſorder, and charged with ſuch fury, that the infidels, unable to ſuſtain the ſhock, fled in diſorder, and were purſued up to their very trenches, leaving the ſpace where they had been defeated covered with their dead. This ſucceſs gave a new turn to affairs. No time was loſt in filling up the interval that had been ſo unwarily left, and in forming the two wings of the imperialiſts for a new effort. The impatience of the ſoldiers to engage prognoſticated ſucceſs. The right began the attack; carried with irreſiſtible impetuoſity the batteries whoſe fire they had hitherto ſuſtained, and turned the cannon againſt the entrenchments which protected the Turkiſh camp. The left experienced more oppoſition. The enemy had their principal forces on that ſide, and theſe, reinforced by ſeveral corps whom the ſucceſs of count Palſi had driven from the right, conſtituted an immenſe ſuperiority. The janizaries defended themſelves with great bravery, and repulſed the Auſtrians in their firſt attack; but theſe rallying, returned to the charge, beat the Turks from their outermoſt entrenchment, and puſhing their advantage, advanced regularly up to the ſecond, without firing a muſket till they came within ten paces of the enemy. This work was carried in leſs time than the firſt: the Turkiſh entrenchments were forced one after another, as well as ſeveral *coupures* with which their camp was defended; and notwithſtanding reſiſtance was attempted at each of them, and the Auſtrians experienced every where a terrible fire, yet the courage and conduct of prince Eugene ſurmounted every obſtacle, and obliged victory, after a ſtruggle of ſix hours, to declare in his favour. The laſt ſerious ſtand made by the infidels, was at a grand battery mounted with 18 pieces of cannon, and defended by 20,000 janizaries, ſuſtained by 10,000 ſpahis, the braveſt troops in the Turkiſh army. It was neceſſary to halt and form the troops anew for this perilous attempt; but when the word to charge was given, they ruſhed forward with an impetus nothing was capable of reſiſting. The Imperial grenadiers, in defiance of the fire from the battery, bore down all oppoſition, mounted through the embraſures, and drove the Turks from their guns; while the reſt of the army made ſuch ſlaughter, that the bodies of the ſlain roſe in heaps round the redoubt. The routed forces, driven on all ſides from their entrenchments, retired into the plain, as if to form once more for the defence of their camp; but obſerving the Imperialiſts, after having gained the heights, advancing towards them in good order, they betook themſelves to flight in every direction, leaving their camp, baggage, and ammunition, at the mercy of the conquerors. The victory was complete by 9 o'clock in the morning. The plunder of the infidels' camp, which reſembled a large city, was given to the ſoldiers.

This battle, fought on the 16th of Auguſt 1717, coſt the Turks 10,000 of their beſt troops killed in the action, and 3,000 in the purſuit. About 5,000 were wounded, and nearly the ſame number made priſoners. In the Turkiſh camp and lines were found 131 pieces of braſs cannon, 30 mortars, and an immenſe quantity of powder, bullets, bombs, and grenadoes. There were alſo taken 52 colours, 9 horſetails, and other military trophies. The loſs on the German ſide, by reaſon of the fog, was not in proportion to the length of the fight. Their killed amounted to nearly 3,000 men, among whom were the generals count Hauben and Dalberg; and about 4,500 were wounded. Of the latter, however, only about 2,000 recovered. In conſequence of this great victory,

victory, Belgrade surrendered on the 19th; the garrison still consisting of more than 25,000 men, being allowed to march out with all their effects. Its fortifications towards the land were in a most excellent state, and more than 400 pieces of cannon and mortars found on the works in the arsenals, and on board the flotilla on the Danube.

Belgrade, which the peace of Passarowitz left in possession of the Austrians, was unsuccessfully attacked by the Turks in 1739; but by the treaty concluded that year under the mediation of France, was restored to the Porte. Its fortifications were, however, previously demolished. In 1789, it was besieged (Sept. 12.) by an Austrian army under marshal Laudohn, who in his approaches made use of the old lines of circumvallation constructed by prince Eugene, and which the Turks, from an unaccountable negligence, had neglected to fill up. The marshal, assisted by a numerous and well-served train of artillery, proceeded with such rapidity in his attacks, that after all the suburbs and outworks had been carried sword in hand, the garrison, apprehensive of a storm, surrendered (Oct. 8.) upon honourable terms. Immense stores, with about 300 pieces of artillery, were found in the place. Belgrade was, however, anew given up to the Turks in 1791, at the peace of Sistova, since which time it has continued quietly in their possession.

Belgrade, a township of America, in the county of Lincoln and district of Maine, incorporated in 1796; formerly called Washington-plantation. It lies west of Sidney, and between Androscoggin and Kennebeck rivers.

BELGRADO, a town of the Venetian states of Italy, in Friuli, situate near the river Tagliamento. N. lat. 46°. E. long. 13° 51'.

BELHAVEN, the former name of Alexandria, in Fairfax county, Virginia. See Alexandria.

BELIA, in *Entomology*, a species of Papilio, with entire white wings; the lower ones yellow, and slightly fasciated with grey beneath. A native of Barbary. Fabricius.

Belia, in *Ancient Geography*, a town of Hispania Terraconensis, is the country of the Hedetani (Ptol.), east of Bilbilis, and nearly south-east of Cæsar-Augusta (D'Anville); now *Belchite*, which see.

BELIAL, formed of בלי *non, nothing*, and יעל, denoting in Hiphil, to *profit*, q. d. unprofitable; in *Scripture History*, signifies a wicked worthless person, who is resolved to endure no subjection. Thus the inhabitants of Gibeah, who abused the Levite's wife, are stigmatised by the name of Belial. (Judges, xix. 22.) Hophni and Phineas Eli's sons, are called sons of Belial (1 Sam. ii. 12.) on account of the several crimes they had committed, and their indecorous behaviour in the temple of the Lord. Sometimes, says Calmet, the name Belial is used to denote the devil. To this purpose, he cites 2 Cor. vi. 15. where the apostle Paul says, "What concord hath Christ with Belial?" whence it appears, as he supposes, that in the apostle's time, the Jews, under the name of Belial, commonly understood the devil in the places where this term occurs in the Old Testament. Others are of opinion, that the heathen demons might be called "Belial," either because they were of no use, or because so much wickedness entered into the idea which the Pagans entertained of them. However, it has been suggested, that there may be no reference to the heathen gods at all, whether they were deified ghosts or not; the word Belial being often applied to living men; and it being the general design of the apostle in this place to dissuade Christians from suffering themselves to be drawn into any thing criminal by the heathens. Grot. in loc. Farmer's Demoniacs, p. 201.

The learned Bryant (Analysis Anc. Mythol. vol. ii. p. 163.) considers Belial as the title of the chief Syrian god, called Bel and Baal, and rendered by the Greeks Βελιας, bed liar. Hence, Clemens Alex. (l. v. p. 680.) instead of saying, what agreement can there be between Christ and Belial, says, Τις δε συμφωνησις χριστου προς βελιαρ. This Belial, or Beliar, was the same as Belorus and Osiris, who were worshipped under the symbol of a serpent. Hence Hesychius explains the term Beliar by a serpent.

BELIAS, in *Ancient Geography*, a river of Asia, which sprung in Davana, and discharged itself into the Euphrates. Ammian. Marcell.

BELICA, an episcopal town of the Gauls, in the fifth Lugdunensis.

BELICENA, a town of Spain, in Grenada, 11 leagues from Grenada.

BELICI, a river of Sicily, which empties itself into the sea near Bigini, in the Val de Mazara. It resembles (says Swinburne, vol. iii. p. 374.) the Mole in Surry in size and colour; and winds very agreeably between high banks overgrown with elms, willows and tamarisks. The vale on both sides is wide and well laid out in corn-fields, and pastures crowded with horses and horned cattle.

BELIDA. See Bleeda.

BELIDES, in *Antiquity*. See Danaides.

BELIDOR, Bernard Forest de, in *Biography*, a French mathematician and engineer, was born in Catalonia, about the year 1698, and became professor-royal at the artillery school of la Fere, and provincial commissary of artillery. By various exploits, he first discovered that the proportion of gun-powder in the loading of cannon might be reduced to two-thirds of the quantity, without lessening its effect: but as he communicated this economical idea to cardinal Fleury, without previously consulting the grand-master of artillery, he lost both his places. Upon this the prince of Conti took him to Italy, and by his patronage, Belidor was again brought into notice at court. Marshal Belleisle, the war-minister, appointed him inspector of artillery, and allotted to him apartments at the arsenal of Paris, in which he died, Sept. 8, 1761. Belidor was chosen an associate of the academy of sciences in 1751; and was the author of several useful works on civil and military architecture, hydraulics, fortification, and engineering: viz. "Sommaire d'un cours d'Architecture Militaire, civile et hydraulique," 1720, 12mo.; "Nouveau cours de Mathematiques, &c." 1725, 4to.; "La Science des Ingenieurs," 1729, 4to.; "Le Bombardier François," 1734, 4to.; "Architecture Hydraulique," 1737—1761, 4 vols. 4to.; "Dictionnaire portatif de l'Ingenieur," 8vo.; and "Traité des Fortifications," 4 vols. 4to. Several of his pieces are also inserted in the memoirs of the academy of sciences for the years 1737, 1750, 1753, and 1756. Nouv. Dict. Histor. Hutton's Math. Dict.

BELIEF, in its general and natural sense, denotes a persuasion, or a strong assent of the mind to the truth of any proposition. In which sense, belief has no relation to any particular kind of means or arguments, but may be produced by any means whatever.—Thus we are said to believe our senses, to believe our reason, to believe a witness, &c. And hence, in rhetoric, all sorts of proofs, from whatever topics deduced, are called πιστεις, because apt to produce belief, or persuasion touching the matter in hand.

Belief, in its more restrained and technical sense, invented by the schoolmen, denotes that kind of assent which is grounded only on the authority or testimony of some person or persons, asserting or attesting the truth of any matter proposed. In this sense belief stands opposed to knowledge and science. We do not say we believe that snow is white, or that

that the whole is equal to its parts; but we fee and know them to be fo: that the three angles of a triangle are equal to two right angles, or that all motion is naturally rectilinear, are not faid to be things credible, but fcientifical; and the comprehenfion of fuch truths is not belief, but fcience. But when a thing propounded to us is neither apparent to our fenfe, nor evident to our underftanding; neither certainly to be collected from any clear and neceffary connection with the caufe from whence it proceeds, nor with the effects which it naturally produces; nor is taken up upon any real arguments, or relation thereof to other acknowledged truths: and yet, notwithftanding, appears as true, not by a manifeftation, but by an atteftation of the truth, and moves us to affent, not of itfelf, but in virtue of a teftimony given to it—this is faid to be properly credible: and an affent to this is the proper notion of belief or faith.

A judicious writer (Price's Review of the principal queftions in Morals, p. 158.) is of opinion, that all the general grounds of belief or affent, may be comprehended under the three following heads: viz. 1ft. Immediate confciousnefs (which fee), or feeling; whence we acquire the knowledge of our own exiftence, and of the feveral operations, paffions, and fenfations of our own minds; and to this head may be referred the information we derive from our powers of recollection and memory; 2dly, Intuition (which fee); and to this we owe our belief of all felf-evident truths, our ideas of the general, abftract affections and relations of things, our moral ideas, and whatfoever elfe we difcover, without making ufe of any procefs of reafoning; and 3dly, Argumentation or Induction. See thefe articles. See alfo Assent and Faith.

BELIENE, in *Geography*, a village of Egypt, depending on the grand fcheik, and agreeably fituated between two canals; 12 miles fouth of Girgé.

BELIEVERS, in *Ecclefiaftical Hiftory*, an appellation given towards the clofe of the firft century to thofe Chriftians who had been admitted into the church by baptifm, and inftructed in all the myfteries of religion: they had alfo accefs to all the parts of divine worfhip, and were authorifed to vote in the ecclefiaftical affemblies. They were thus called in contradiftinction to the *catechumens*, who had not been baptized, and were debarred from thefe privileges.

BELILLA, in *Botany*. See Mussænda.

BELIM, in *Geography*. See Belem and Para.

BELIN, a town of France, in the department of Gironde, and chief place of a canton in the diftrict of Bourdeaux. The place contains 1212, and the cantons 7008 inhabitants: the territory includes 585 kiliometres and 6 communes.

BELINA, a town of European Turkey, in Bofnia, about midway between Banjaluka and Belgrade.

BELION, a name given to a river of Lufitania, called alfo Limias, Limæus, Lethe, and the river Oblivion, in *Ancient Geography*, was the boundary of the expedition of Decimus Brutus. His foldiers, when they arrived at this river, refufed, from motives of fuperftition, to crofs it; upon which he fnatched an enfign out of the hand of the bearer, and paffed over, by which his army was encouraged to follow (Livy). He was the firft Roman who ever proceeded fo far, and ventured to crofs. The appellation, according to Strabo, tooks its rife from a fedition that occurred in a military expedition between the Celtici and Turduli after crofing this river, in which the general was flain, fo that they remained difperfed there; and from this circumftance it was called the river of Lethe, or Oblivion. (Cellarius.) It is now called "El Lima," and runs weftward into the Atlantic, to the fouth of the Minho.

BELISAMA, or Belizana, in *Mythology*, a name given by the Gauls to their Minerva, or to the goddefs who was the inventrefs of the arts. She was repefented with a helmet adorned with a plume, clothed in a tunic, without fleeves, and covered with a mantle called "peplum." Her attitude, with her head leaning on her right hand, was that of a perfon in a profound reverie. Human victims were facrificed on her altars.

BELISAME. See Belasama.

BELISARIUS, in *Biography*, the *Africanus* of New Rome, was born, and probably educated, among the Thracian peafants; and advanced from the humble ftation of one of the private guards of Juftinian, then general of the Roman forces, and afterwards emperor, in which he had ferved with valour and reputation, to diftinguifhed military command. Under the new title of General of the Eaft, he encountered the Perfian army near the fortrefs of Dara, on the confines of Perfia, with a much inferior force, both as to the number and quality of his troops, and obtained a decifive victory. In the next campaign, A.D. 530, he haftened from Dara to the relief of Syria, which was invaded by the Perfians; and though he was defeated in an engagement which the impatience of his troops had precipitated, he faved his army from the confequences of their own rafhnefs, and the victory of the Perfian commander was fo dearly purchafed, that it was foon followed by peace. Belifarius, on his return to Conftantinople, rendered effential fervice to the emperor Juftinian, by quelling a dangerous fedition. In 533, the fupreme command of the fleet and army, deftined for the African war, was delegated to Belifarius, with an unlimited power of acting according to his own difcretion, as if the emperor himfelf were prefent. After a voyage of three months, in which he had repeated opportunities of exercifing his talents as a commander, he difembarked his troops on the African coaft. Immediately upon their landing an inftance of pillage occurred, which gave him occafion for inculcating the maxims of juftice, moderation, and genuine policy. "When I firft accepted the commiffion of fubduing Africa, I depended much lefs" faid the general, "on the numbers, or even the bravery of my troops, than upon the friendly difpofition of the natives, and their immortal hatred to the Vandals. You alone can deprive me of this hope; if you continue to extort by rapine, what might be purchafed for a little money, fuch acts of violence will reconcile thefe implacable enemies, and unite them in a juft and holy league againft the invaders of their country." His exhortations, accompanied by rigid difcipline, produced the moft falutary effect. The inhabitants, inftead of deferting their houfes, or hiding their corn, fupplied the Romans with a fair and liberal market; the civil officers of the province continued to exercife their functions in the name of Juftinian; and the clergy, from motives of confcience and intereft, affiduoufly laboured to promote the caufe of a catholic emperor. In his progrefs towards Carthage, he defeated, with great flaughter, the formidable army collected by Gelimer, and entrufted to the conduct of his brother and nephew, and reduced the king himfelf to the neceffity of feeking his fafety by a precipitate flight.

Belifarius, having taken poffeffion of the city, reftored, with incredible difpatch, its walls and ditches, which the heedleffnefs and indolence of the Vandals had fuffered to decay. The defeat of Zano, the brother of Gelimer, and the pufillanimous flight of the king himfelf, terminated the conqueft of Africa in the manner already related under the article Africa, which fee. Belifarius, on his return to Conftantinople in 534, obtained a fplendid triumph, and was created fole conful for the enfuing year. The day of his inauguration refembled the pomp of a fecond triumph; his

curule chair was borne aloft on the shoulders of captive Vandals; and the spoils of war, gold cups, and rich girdles, were profusely scattered among the populace. His most distinguished recompence, however, consisted in the faithful execution of a treaty, for which he had pledged his honour to the king of the Vandals, who received from the emperor an ample estate in the province of Galatia, whither he retired with his family and friends to a life of peace, of affluence, and perhaps of content.

The next object to which the attention of Belisarius was directed was that of terminating the dominions of the Ostrogoths in Italy. With this view he invaded Sicily A.D. 535, and having laid siege to Palermo, which was soon reduced, and which was the only place where he met with any resistance, he soon after entered Syracuse in triumph. In the spring of the following year he was diverted from the prosecution of his designs by a dangerous revolt of the African forces, which demanded his presence at Carthage. By an easy victory he would have restored the peace of Africa; if he had not been hastily recalled to Sicily, for the purpose of appeasing a sedition which had broken out in his own camp. Having effected this object, and sufficiently garrisoned Palermo and Syracuse, he embarked his troops at Messina, A.D. 537, and landed them, without resistance, on the opposite shores of Rhegium. From Rhegium to Naples, his fleet and army, almost always in view of each other, advanced nearly 300 miles along the sea-coast; and he received the submission of the inhabitants of the several countries of Bruttium, Lucania, and Campania, through which he passed. The capture of Naples, to which he laid siege both by sea and land, was for some time delayed; and he had reconciled himself to the disgrace of abandoning it, that he might march, before the winter season, against Rome and the Gothic king. But in the [illegible] of anxious suspense a stratagem occurred of introducing, by means of the dry channel of an aqueduct, a file of armed soldiers into the heart of the city, who gained admittance to their companions, by whom the walls were scaled on all sides and the gates burst open. Belisarius, having succeeded in this enterprise, restrained the cruelty and sacrilege of the Huns; and, for this purpose, he appeared alone in the streets and churches of Naples, and exerted himself in moderating the calamities of the inhabitants. "The gold and silver," he repeatedly exclaimed, "are the just rewards of your valour. But spare the inhabitants; they are Christians, they are supplicants, they are now your fellow subjects. Restore the children to their parents, the wives to their husbands; and shew them, by your generosity, of what friends they have obstinately deprived themselves." The city was thus saved by the virtue and authority of the conqueror. From Naples, Belisarius proceeded to Rome; which, on his approach, was evacuated by the Gothic garrison, and which, after sixty years' servitude, was delivered from the yoke of the Barbarians, and surrendered, without opposition, Dec. 10, A.D. 536. The Gothic chief, who was himself a trophy of the victory, was sent with the keys of Rome to the throne of the emperor Justinian. In the following spring Vitiges, who had been elected by the Goths as the successor of the feeble and deposed Theodatus, collected an army of 150,000 men, and attempted to recover the capital. On the approach of the Barbarians, Belisarius sallied forth to survey their camp; but being surrounded by the enemy, he extricated himself by singular exertions of strength and valour. When the whole army of the Goths, having passed the Tiber, formed the siege of the city, which was continued above a year, before their final departure. Belisarius, aided by his wife Antonia, his constant companion in every expedition, made many efforts for the relief of its distressed inhabitants, and for repulsing the besiegers, which at length, in concurrence with a force sent by the emperor, were crowned with success; so that Rome was rescued from the hostile attacks of the Gothic army, which raised the siege, and, after attempting the recovery of Rimini, took shelter within the walls of Ravenna. Upon the arrival of an army from Constantinople, under the command of Narses, a dissension arose between the two generals, whose respective authority was not accurately defined; but Belisarius was appointed, by the emperor's special commission, to the supreme command. He incurred, however, considerable odium by the hasty execution of Constantine, governor of Spoleto, who had committed an act of robbery, and in consequence of this measure, the two armies separated, and Narses was exhorted by the leaders of the discontented faction to assume an independent and supreme command. Belisarius, by his prudence and perseverance, regained his reputation and influence, and procured the recal of Narses, and the establishment of military subordination. In the interval of discord, the Goths, aided by the Franks, captured Milan, with circumstances of aggravated cruelty. In 1539, the destruction of Milan was succeeded by the invasion of Theodebert of Austrasia, the most powerful and warlike of the Merovingian kings, who, besides the succour which he afforded to the Goths, invaded the plains of Italy with an army of 100,000 barbarians, and marked his way by ruin and slaughter. The clamours of his conquering army, diminished by famine and disease, at length induced Theodebert to listen with respect to the mild exhortations of Belisarius; who, as soon as he was delivered from his foreign and domestic enemies, seriously employed his forces in the final reduction of Italy. Having reduced Osimo and Fæsulæ, he proceeded to invest Ravenna; and whilst he was engaged in the blockade of this city, he received from Justinian a treaty of peace, which he had actually signed without deigning to ask his counsel and concurrence. By this disgraceful and precarious treaty, Italy and the Gothic treasure were divided, and the provinces beyond the Po were left with the legal title to Vitiges. Belisarius rejected the treaty of partition, and declared his firm resolution of leading Vitiges in chains to the feet of Justinian. Upon this the Goths retired with doubt and dismay, and perceiving their own distressed and perilous estate, offered their arms, their treasures, and the fortifications of Ravenna to Belisarius, if he would disclaim the authority of a master, accept their choice, and assume, as he had deserved, the kingdom of Italy. The Roman general, seeming to acquiesce in their proposal, stipulated the surrender of Ravenna at an appointed day; and in December 1539, he entered the city without opposition, secured the royal treasures, and placed Vitiges under a guard in the royal palace. The submission of the capital was followed by that of the towns and villages in Italy; and the independent Goths, who still remained in arms at Pavia and Verona, were ambitious only to become the subjects of Belisarius. But his inflexible loyalty rejected, except as the substitute of Justinian, their oaths of allegiance: nor was he offended by the reproach of their deputies, that he rather chose to be a slave than a king. Justinian, listening to the suggestions of envy and jealousy, recalled Belisarius; who obeyed the summons, and departed for Constantinople, carrying with him the treasures of Ravenna, and the persons of Vitiges, his wife, and chief nobles. The emperor received him with seeming cordiality, but without granting him the well-earned honours of a second triumph. Belisarius, however, was the object of universal admiration and applause among the people; and by the number of soldiers in his private pay, and the attachment of the army, whose affection he secured by his justice and liberality, he might

might well be reckoned the second person in the empire. To the husbandmen he was endeared by the peace and plenty which they enjoyed under the shadow of his standard. Such had been the rigid discipline of his camp, that the country, instead of being injured by the march of the Roman armies, had been enriched by them; and not so much as an apple was gathered from a tree, nor could a path be traced in the corn fields. As to his personal conduct, he was sober and chaste to so great a degree, that, in the licence of a military life, none could boast that they had seen him intoxicated with wine, and that he was never suspected of violating the laws of conjugal fidelity. "The spectator and historian of his exploits," says Gibbon, "has observed, that amidst the perils of war, he was daring without rashness, prudent without fear, slow or rapid according to the exigencies of the moment; that in the deepest distress he was animated by real or apparent hope; but that he was modest and humble in the most prosperous fortune. By these virtues he equalled or excelled the ancient masters of the military art. Victory, by sea and land, attended his arms. He subdued Africa, Italy, and the adjacent islands; led away captives the successors of Genseric and Theodoric; filled Constantinople with the spoils of their palaces; and in the space of six years recovered half the provinces of the western empire. In his fame and merit, in wealth and power, he remained, without a rival, the first of the Roman subjects; the voice of envy could only magnify his dangerous importance; and the emperor might applaud his own discerning spirit, which had discovered and raised the genius of Belisarius." Nevertheless, the fame, and even the virtue of Belisarius, were polluted by the lust and cruelty of his wife Antonina. This profligate woman was the daughter of a theatrical prostitute; and in the various situations of the fortune of her parents, she became the companion, the enemy, the servant, and the favourite of the empress Theodora. Before her marriage with Belisarius, she had one husband and many lovers; and after their connubial union, she contrived to gratify her licentious passions, and to impose on the credulity of her husband, whom she dishonoured, and whom by her influence she instigated to transactions that fix an indelible stain on his memory.

When Syria was invaded by Chosroes king of Persia, in the year 540, and Antioch, its rich capital, destroyed, Belisarius, the conqueror of Italy, was appointed to the defence of the east. Accordingly, in the year 541, he encamped beyond the Euphrates, within six miles of Nisibis, in order to restrain the progress of the Persian monarch on the coast of the Euxine. Having succeeded, without the support which he had reason to expect, in forcing Chosroes to return with loss and precipitation, he was recalled, at the close of the campaign, to Constantinople, by an ungrateful court; but the dangers of the ensuing spring restored his confidence and command; and the hero, almost alone, was dispatched with the speed of post-horses, to repel by his name and presence the invasion of Syria. On the banks of the Euphrates his firm attitude restrained Chosroes from advancing towards Palestine, and compelled him to repass the river: thus accomplishing his purpose by a safe and bloodless victory, more glorious than his African and Gothic triumphs, in which neither fortune, nor the valour of his soldiers, can subtract any part of the general's renown. But the danger threatened to Italy by the rapid conquests of Totila, who had been advanced to the Gothic throne, required the presence of Belisarius: and accordingly he was again recalled from the east, and in 544, he arrived at the port of Ravenna with an inconsiderable number of ill-provided recruits. Thus supported, he was unable to impede the progress of Totila, and to prevent his laying siege even to Rome. When the city was reduced to extreme distress by the want of provisions, the supply of which had been long obstructed by the besieging army, Belisarius made a bold attempt for its relief. But his enterprise for this purpose having failed, Rome was obliged to submit to the Gothic yoke; and Belisarius could only prevail by his interposition to prevent its threatened destruction. Totila, having demolished its walls, and removed most of its inhabitants, marched into the south of Italy; upon which Belisarius took possession of it, and hastily fortified himself within its circuit; so that he was able thrice to repulse the Gothic army which Totila brought against it. But whilst he was engaged in its defence, he was commanded by the emperor to leave a sufficient garrison at Rome, and to transport himself into Lucania, in order to suppress a revolt which had taken place in that province. In this warfare he was basely vanquished by the delay, disobedience, and cowardice of his officers; and having reposed in his winter-quarters at Crotona, he was obliged by the rapid march of the Goths to make his escape to the coast of Sicily. At length Antonina, who had been sent to Constantinople to solicit succours, obtained, after the death of the empress, permission for Belisarius to return. Accordingly, after failing to deliver Italy from the Goths, and wandering like a fugitive along the coast, without daring to march into the country, or to accept the bold and repeated challenge of Totila, he was recalled in September 548. The subsequent success of Narses in recovering Italy, threw a shade over the military reputation of Belisarius; though about 10 years afterwards he distinguished himself by saving the capital from an incursion of the Bulgarians, who had advanced to its long walls, about 40 miles from the city, and occasioned an universal alarm. The enemy were put to flight by the military veteran at the head of a tumultuary band; though it was necessary to purchase their return into their own country by a heavy ransom. This was the last exploit of Belisarius; and his remaining days were doomed to misfortune and disgrace. The jealousy of the emperor, increasing with his years, led him to suspect Belisarius of being concerned in a conspiracy against his crown and his life; and the veteran general, after forty years' service, and on incompetent testimony, was judged guilty, Dec. 5, A. D. 563. His life, indeed, was spared, but his fortunes were sequestered, and he was guarded for several months, as a prisoner, in his own house. At length, July 19, A. D. 564, his innocence was acknowledged; his freedom and honour were restored; and death, which might be hastened by resentment and grief, removed him from the world about eight months after his deliverance, March 13, A. D. 565. "The name of Belisarius," says Gibbon, "can never die; but instead of the funeral, the monuments, the statues, so justly due to his memory, I only read, that his treasures, the spoils of the Goths and Vandals, were immediately confiscated by the emperor. Some decent portion, however, was reserved for the use of his widow; and as Antonina had much to repent, she devoted the last remains of her life and fortune to the foundation of a convent. Such is the simple and genuine narrative of the fall of Belisarius and the ingratitude of Justinian. That he was deprived of his eyes, and reduced by envy to beg his bread, *Give a penny to Belisarius the general*, is a fiction of later times, which has obtained credit, or rather favour, as a strange example of the vicissitudes of fortune."

The source of this idle fable may be derived from a miscellaneous work of the twelfth century, the Chiliads of John Tzetzes, a monk, who relates the blindness and beggary of Belisarius in ten vulgar or political verses. (Vid. Corp. Poet. Græc. tom. ii. p. 311.)

"Εκπωμα ξυλινον κρεῶν εβοα τω μιλιω
Βελισαριω εβολεν δοῦς τω στρατηλαῖη
Ου τυχη μεν εδοξασεν, αποστιφλοι δ' ο φθονος."

This

This moral or romantic tale was imported into Italy with the language and manuscripts of Greece; repeated before the end of the fifteenth century by Crinitus, Pontanus, and Volaterranus; attacked by Alicat for the honour of the law, and defended by Baronius for the honour of the church. Yet Tzetzes himself had read in other chronicles, that Belisarius did not lose his sight, and that he recovered his fame and fortunes. Gibbon's Hist. Decl. and Fall of the Rom. Emp. vol. vii.

The statue in the villa Borghese, at Rome, in a sitting posture, with an open hand supplicating alms, is commonly attributed to Belisarius; but it may be ascribed with greater propriety to Augustus, represented under the character of a mendicant, propitiating the anger of Nemesis. Suetonius (in Aug. c. 91.) informs us, that on a certain day every year, he humbled himself to the condition of a beggar, extending his open hand, and soliciting alms from the people. Winkelmann, tom. iii. p. 266.

BELISSO, in *Ancient Geography*, a town of Spain, near Augusta Augurica. Itin. Antonin.

BELITANI, a people of Spain, according to Pliny.

BELITZ, in *Geography*, a town of Germany, in a prefecture of the same name, in the circle of Zauch, and country of Middle-Mark of Brandenburg, seated on the river Niepelitz, or Belitz, which has repeatedly suffered from fire. It is defended by old ramparts and ditches, and has a manufacture of cloth; 28 miles south-west of Berlin, and 12 south-west of Potzdam.

BELITZY, a town and district of the Russian empire, in the government of Mohilef, seated on a rivulet falling into the Sosh.

BELKANI, a town of Asiatic Turkey, in the province of Natolia, 14 miles north of Satalia.

BELKIN, a town of Egypt, 45 miles south-west of Damietta, and 54 south-west of Cairo.

BELKOVA, a river of Russia, in the government of Archangel, which runs into the Frozen sea. N. lat. 68° 30'. E. long. 58° 34'.

BELL, a popular machine, ranked by musicians among the number of musical instruments of percussion. The music of bells is altogether melody; but the pleasure arising from it consists in the variety of interchanges, and the various successions and general predominance of the consonances in the sounds produced.

The parts of a bell are the body or *barrel*, the *clapper* within side, and the ear or *cannon*, whereby it is hung to a large beam of wood.—Its usual matter is a kind of compound metal, called *bell-metal*. The thickness of its edges is usually $\frac{1}{10}$ of the diameter, and its height twelve times its thickness. The bell-founders have a diapason, or bell-scale, with which they measure the size, thickness, weight, and tone of their bells. For the method of casting bells, see FOUNDERY.

The sound of a bell arises from a vibratory motion of the parts thereof, much like that of a musical chord. The stroke of the clapper, it is evident, must change the figure of the bell, and of round make it oval; but the metal having a great degree of elasticity, that part which the stroke drove farthest from the centre will fly back again, and this even somewhat nearer to the centre than before; so that the two points, which before were the extremes of the longer diameter, now become those of the shorter. Thus, the circumference of the bell undergoes alternate changes of figure, and by means thereof gives that tremulous motion to the air, in which sound consists.

M. Perrault maintains, that the sound of the same bell or chord is a compound of the sound of the several parts thereof; so that where the parts are homogeneous, and the dimensions of the figure uniform, there is such a perfect mixture of all these sounds, as constitutes one uniform, smooth, even sound: and the contrary circumstances produce harshness. This he proves from the bell's differing in tune according to the part you strike; and yet strike it at any where, there is a motion of all the parts. He therefore considers bells as composed of an infinite number of rings; which, according to their different dimensions, have different tones, as chords of different lengths have; and when struck, the vibrations of the parts immediately struck determine the tone; being supported by a sufficient number of consonant tones in the other parts. Mr. Hawksbee, and others, have found by experiment, that the sound of a bell struck under water, is a fourth deeper than in the air: though Mersennus says, it is of the same pitch in both elements. This writer has treated largely of the different metals of which bells are formed, of their figure, crassitude, and degrees of ponderosity, as they respect each other in a given series.

Bells are observed to be heard farther, placed on plains, than on hills; and still farther, in valleys, than on plains: the reason of which it will not be difficult to assign, if it be considered, that the higher the sonorous body is, the rarer is its medium: consequently the less impulse it receives, and the less proper vehicle it has to convey it to a distance. There is a curious observation in a paper of M. Reaumur's in the Memoirs of the Paris Academy, relating to the shape most proper for bells, to give them the loudest and clearest sound. He observes, that as pots, and other vessels more immediately necessary for the service of life, were doubtless made before bells, it probably happened, that the observing these vessels to have a sound when struck, gave occasion to making bells, intended only for sound, in that form: but that it does not appear that this is the most eligible figure; for lead, a metal which is, in its common state, not at all sonorous, yet becomes greatly so on being cast into a particular form, and that very different from the common shape of bells. In melting lead for the common occasions of casting in small quantities, it is usually done in an iron ladle; and as the whole is seldom poured out, the remainder, which falls to the bottom of the ladle, cools into a mass of the shape of that bottom. This is consequently a segment of a sphere, thickest in the middle, and thinner towards the edges: nor is the ladle any necessary part of the operation, since, if a mass of lead be cast in that form in a mould of earth or sand, in any of these cases it is found to be very sonorous. Now, if this shape alone can give sound to a metal, which in other forms is perfectly mute, how much more must it necessarily give it to other metals naturally sonorous in whatever form. It should seem that bells would much better perform their office in this than any other form, and that it must particularly be a thing of great advantage to the small bells of common house-clocks, which are required to have a shrill note, and yet are not allowed any great size. M. Reaumur very judiciously observes, that if our fore-fathers had opportunities of being acquainted with the sound of metals in this shape, we should probably have had all our bells at present of this form. Mem. Acad. Par. 1726.

With regard to the origin of bells, those of a small size are very ancient; but those of a large bulk, hung in towers and hung by ropes, were introduced at a much later period. Among the Jews, it was ordained by Moses, that the lower part of the blue robe, which was worn by the high priest in religious ceremonies, should be adorned with pomegranates and gold bells intermixed at equal distances. (See Exodus, xxviii. 33, 34.) The kings of Persia are said to have had the hem of their robes adorned, like that of the Jewish high-priests, with pomegranates and gold bells. The Arabian princesses wear on their legs large hollow gold rings, filled

with ſmall flints, which ſound like bells, when they walk; and theſe, with ſeveral appurtenances, give notice that the miſtreſs of the houſe is paſſing, ſo that the ſervants of the family may behave with reſpect, and ſtrangers may retire to avoid ſeeing the perſon who advances. Calmet ſuppoſes, that it was with ſome ſuch deſign of giving notice that the high prieſt was paſſing, that he wore little bells at the hem of his robe; and it was alſo a kind of public notice that he was about to enter into the ſanctuary. In the court of the king of Perſia, no one entered the apartments without ſome warning; and thus the high prieſt, when he entered the ſanctuary, deſired permiſſion to enter by the ſound of his bells, and in ſo doing he eſcaped the puniſhment of death annexed to an indecent intruſion. The prophet Zachary (ch. xiv. 20.) ſpeaks of the bells of the horſes, which were probably hung to the bridles or forcheads of war-horſes, that they might thus be accuſtomed to noiſe. Calmet.

Among the Greeks, thoſe who went the nightly watch rounds in camps or garriſons, carried with them a little bell, which they rang at each centry-box to keep the ſoldiers appointed to watch awake. A bell-man alſo walked in funeral proceſſions, at a diſtance before the corpſe, not only to keep off the crowd, but to advertiſe the flamen dialis to keep out of the way, leſt he ſhould be polluted by the ſight, or by the funeral muſic. The prieſt of Proſerpine at Athens, called "hierophantus," rung a bell to call the people to ſacrifice. The hour of bathing, at Rome, was announced by the ſound of a bell, and hence it has been ſuppoſed they were uſed to mark the hours of devotion, and ſummon people to church. Servants in the houſes of great men were called up in a morning by the ſound of bells. Zonaras informs us, that bells were hung with whips on the triumphal chariots of their victorious generals, in order to remind them that they were ſtill amenable to public juſtice. Bells were affixed to the necks of criminals going to execution, to warn perſons to avoid ſo ill an omen as the ſight of the executioner or condemned criminal, who was devoted and about to be ſacrificed to the "dii manes." To this ſuperſtition ſome perſons have attributed the cuſtom in England of ringing pariſh bells, while a malefactor is on his way to the gallows; though others have generally ſuppoſed it was intended as a ſignal to all who heard it, admoniſhing them to pray for the paſſing ſoul. Phædrus mentions bells annexed to the necks of brutes: "Celſa cervice eminens, clarumque, collo jactans tintinnabulum." Taking theſe bells away was conſtrued by the civil law to be theft; and if the beaſt was thus loſt, the perſon who took away the bells was to make ſatisfaction. Sheep had them tied about their necks, to frighten away wolves, or rather by way of amulet, or to direct ſhepherds where to find their flocks; and ſince the practice of bleſſing them has been introduced, they have been thought to preſerve animals from epidemical diſorders.

The uſes of bells are ſummed up in the Latin diſtich:

"Laudo Deum verum, plebem voco, congrego clerum,
Defunctos ploro, peſtem fugo, feſta decoro."

To the ſame purpoſe is the following inſcription on bells, mentioned by Weever, in his "Funeral Monuments," p. 122.

"Funera plango, fulgura frango, ſabbata pango,
Excito lentos, diſſipos ventos, paco cruentos."

The firſt bells are ſaid to have been made about the year 400, at Nola, in Campania, whereof St. Paulinus was made biſhop in 409; at leaſt it is aſſerted, he was the firſt who brought them into uſe in the church. Before his time Chriſtians made uſe of rattles, "ſacra ligna," to call the congregation together; no bells being allowed by government to a proſcribed ſect. Hence, it is added, they had their Latin names, *Nolæ*, firſt uſed by Quintilian, and *Campanæ*, a term which was adopted in the time of St. Jerom. But others ſay, they take theſe names, not from their being invented in Campania, but becauſe it was here the manner of hanging and balancing them in ſteeples, now in uſe, was firſt practiſed; at leaſt, that they were hung on the model of a ſort of balance invented or uſed in Campania. For in Latin writers we find *Campana ſtatera*, for a *ſteel-yard*; and in the Greek καμπανίζω, for *ponderare*, to weigh. At firſt they were called *ſaints*; and hence are derived a *tocſaint*, or *tocſin*.

Polydore Virgil aſcribes the invention of church bells to pope Sabinian, St. Gregory's ſucceſſor; but this is a miſtake; for St. Jerom, contemporary with Paulinus, makes mention of one. Pope Sabinian did not invent bells; but he was the firſt who appointed the canonical hours to be diſtinguiſhed by them.

We even find mention made of bells in Ovid, Tibullus, Martial, Statius, Manilius, and the Greek authors, under the appellations of *tintinnabula*, and *ſounding braſs*. Suetonius, Dion, Strabo, Polybius, Joſephus, and others, mention them under the names of *petaſus*, *tintinnabulum*, *æramentum*, *crotalum*, *ſignum*, &c. But theſe appear to have been no more than baubles, and not like the huge bells in uſe among us.

Hieronymus Magius, who has a treatiſe on bells (written when in chains in Turkey, and which is accounted very remarkable, purely from his memory, without the aſſiſtance of any book), makes large bells a modern invention. Indeed, we do not hear of any before the ſixth century, when they were applied to eccleſiaſtical purpoſes in ſome of the monaſtic ſocieties of Caledonia, as they were in thoſe of Northumbria before the concluſion of the 7th century; and they ſeem to have been uſed from the firſt erection of pariſh churches in this kingdom. In 610, we are told, Lupus, biſhop of Orleans, being at Sens, then beſieged by the army of Clotharius, frighted away the beſiegers by ringing the bells of St. Stephen's. The firſt large bells in England are mentioned by Bede, towards the latter end of that century, or about the year 670. They ſeem to have been pretty common in the year 816. Ingulphus mentions that Turketulus, abbot of Croyland, who died about the year 870, gave a great bell to the church of that abbey, which he named Guthlac, and afterwards ſix others, all which rang together: and not long after this time, Kinſeus, archbiſhop of York, built a tower of ſtone to the church of St. John at Beverly, and placed in it two great bells, and at the ſame time provided that other churches in his dioceſe ſhould be furniſhed with bells. J. Stubbz. Act. Pont. Ebor. fol. 1700. Mention is alſo made by St. Aldhelm; and William of Malmeſbury, of bells given by St. Dunſtan to the churches in the weſt. See Spelm. Gloſſ. voc. *Campana*; and Bingham's Ant. Chriſt. Church, book viii. ch. vii. § 15.

The Greeks are uſually ſaid to have been unacquainted with bells till the ninth century, or about the year 865, when their conſtruction was firſt taught them by a Venetian.

Indeed it is not true, that the uſe of bells was entirely unknown in the ancient eaſtern churches, and that they called the people to church, as at preſent, with wooden mallets. Leo Allatius, in his Diſſertation on the Greek temples, proves the contrary from ſeveral ancient writers. It is his opinion, that bells firſt began to be diſuſed among them, after the taking of Conſtantinople by the Turks; who, it ſeems, prohibited them, leſt their ſound ſhould diſturb the repoſe of ſouls, which, according to them, wandered in the air. He adds, that they ſtill retain the uſe of bells in places remote from the intercourſe of the Turks; particularly, very ancient ones in mount Athos. F. Simon thinks the Turks rather prohibited the Chriſtians the uſe of bells out of

of political than religious reasons; inasmuch as the ringing of bells might serve as a signal for the execution of revolts, &c. The city of Bourdeaux was deprived of its bells for rebellion; and when it was offered to have them restored, the people refused it, after having tasted the ease and conveniency of being freed "from the constant din and jangling of bells."

Matthew Paris observes, that anciently the use of bells was prohibited in the time of mourning; though, at present, they make one of the principal ceremonies of mourning. Mabillon adds, that it was an ancient custom to ring the bells for persons about to expire, to advertise the people to pray for them; whence our passing-bells. The passing-bell anciently served two purposes: one of which was engaging the prayers of all good people for departing souls; and the other was, driving away the evil spirits which haunted the bed and house, and which were ready to seize their prey, or to terrify and molest the soul in its passage; but by the ringing of this bell, it is said they were kept at a distance. To this circumstance we may probably ascribe the high price demanded for tolling the largest bell of the church; which being louder, and heard at a greater distance, might keep these evil spirits more remote, and also procure for the dying man a greater number of prayers.

Lobineau observes, that the custom of ringing bells at the approach of thunder is of some antiquity; but that the design was not so much to shake the air, and so dissipate the thunder, as to call the people to church, to pray that the parish might be preserved from mischief by it.

Whatever occasion some catholics may have given for the reproach, that they attribute to bells the power of driving away demons, and dispelling storms; it is certain the ancient canons of the church only ascribe this power very remotely to bells. Their meaning seems to be this: Satan fears and flies from the bells, because he knows that bells summoned good people to church to pray, and he dreads their prayers. It was therefore to prayer, occasioned by the ringing of bells, and not to the bells, that such good effects were ascribed.

The custom of christening or blessing bells is very ancient. The charge of baptizing bells, alleged by protestants against the Roman catholics, has been denied by the latter; but they allow that they bless bells with certain ceremonies, as they do all other church utensils; and that one of the ceremonies is the giving of a name to the bell, in order to distinguish it from others, or in honour of some saint. It seems reasonable, therefore, to acquit them of the blame of prostituting baptism in this case, and to charge them merely with consecration and benediction. Before bells were hung, they were washed, crossed, blessed, and named by the bishop. This is what some protestants have called baptizing of them; but others say, it might be denominated the lustration of them, resembling the lustration of trumpets among the Romans. Cardinal Bona observes (Rer. Liturg. l. ii. c. 22.), that the name of some saint is given to a bell at the time of its consecration, that the people may think themselves summoned to divine service by the voice of the saint whose name the bell bears. Some say that this custom was introduced by pope John XIII. who occupied the pontifical chair from 965 to 972, and who first consecrated a bell in the Lateran church, and gave it the name of John the Baptist. But it is evidently of an older standing; there being an express prohibition of the practice in a capitular of Charlemagne in 789: "ut clocæ non baptizentur." See Hospinian de Origine Templorum, p. 113. where there is a particular account of all the ridiculous ceremonies practised about bells. See Dr. Franklin's Observations on consecrated Bells, and the Form in consecrating them, Experiments, Observations, &c. p. 487, ed. 1769.

Nankin, a city of China, was anciently famous for the largeness of its bells; but their enormous weight having brought down the tower in which they were hung, the whole building fell to ruin, and the bells have ever since been disregarded. One of these bells is nearly twelve English feet high, the diameter seven and a half, and its circumference twenty-three; its figure almost cylindric, except for a swelling in the middle, and the thickness of the metal about the edges, seven inches. From the dimensions of this bell, its weight is computed at 50,000 pounds, which is more than double the weight of that at Erfurt, said by father Kircher to be the greatest bell in the world. These bells were cast by the first emperor of the preceding dynasty, above three hundred years ago. They have each their name, the hanger *tchoui*, the eater *che*, the sleeper *choui*, the will *si*. Father le Compte adds, that there are seven other bells in Pekin, cast in the reign of Youlo, each of which weighs 120,000 pounds. But the sounds even of their biggest bells are very poor; being struck with a wooden instead of an iron clapper.

The Egyptians have none but wooden bells, except one brought by the Franks into the monastery of St. Anthony.

In the churches of Russia their bells are numerous, and distinguished by their enormous size. They are hung, particularly at Moscow, in belfreys or steeples detached from the churches, with guilt or silver cupolas or crosses; and they do not swing like our bells, but are fixed immoveably to the beams, and rung by a rope tied to the clapper, and pulled sideways. One of these bells in the belfrey of St. Ivan' church at Moscow, weighs 127,836 English pounds. It has always been esteemed a meritorious act of religion to present a church with bells, and the piety of the donor has been estimated by their magnitude. According to this mode of estimation, Boris Godunof, who gave a bell of 288,000 pounds to the cathedral of Moscow, was the most pious sovereign of Russia, until he was surpassed by the empress Anne, at whose expence a bell was cast, weighing 432,000 pounds, which exceeds in size every bell in the known world. Its dimensions, as ascertained by Mr. Cox (Travels in Russia, vol. i. p. 322.), are as follow: the height is 19 feet, the circumference at the bottom 63 feet 11 inches, and its greatest thickness 23 inches. The beam to which this vast machine was fastened, being accidentally burnt by a fire in 1737, the bell fell down, and a fragment was broken off towards the bottom, which left an aperture large enough to admit two persons a-breast without stooping.

The ringing or striking of the bells, though it forms no part of divine worship, as some writers have asserted, serves, however, by the number of strokes, to inform any person without the church, what part of the religious service is beginning within it. Thus, several strokes are struck just before the mass; and this is called "blagovest," i. e. the agreeable sound, as a summons to the praises of God. Before the commencement of the liturgy, it sounds three; and in the middle of it, a few strokes are given to the bell, to let the people without know that the hymn to the holy virgin is now beginning to be sung. All persons, on hearing this throw aside their work, bow, and crois themselves, repeating silently the verse then singing in the church. In the same manner is regulated the stated number of strokes at the several periods of the vespers and the matins. On some holidays they are sounded through the whole day. Tooke's Hist. of Russia, vol. i. p. 128.

The same writer also informs us, that ringing the bells on church and court holidays, is a species of exercise of which the Russians are very fond: but they produce nothing like harmony from them. The sole excellency consists in striking the clapper the oftenest.

For further particulars relating to bells, see CHANGES in a given

a given number of bells, TINTINNALOGIA, CARILLONS, and RING.

BELL-*Bay*, in *Geography*, a harbour on the south-west coast of East Greenland, to the north of Horn Sound.

BELL *Sound*, is situated on the west coast of Spitzbergen, in the Icy sea. N. lat. 77° 12′. E. long. 12° 40′.

BELL, *bearing the*. See RACING.

BELLS, *foundery of*. See FOUNDERY.

BELL, *diving*. See DIVING.

BELLS, *electrical*, are used in a variety of entertaining experiments by electricians. The apparatus, which is originally of German invention, consists of three small bells suspended from a narrow plate of metal (*Plate, Electricity,*) the two outermost by chains, and that in the middle, from which a chain passes to the floor, by a silken string. Two small knobs of brass are also hung by silken strings, one on each side of the bell in the middle, which serve for clappers. When this apparatus is connected with an electrified conductor, the outermost bells suspended by the chains will be charged, attract the clappers, and be struck by them. The clappers becoming electrified likewise, will be repelled by these bells, and attracted by the middle bell; and discharge themselves upon it by means of the chain extending to the floor. After this, they will be again attracted by the outermost bells, and thus, by striking the bells alternately, occasion a ringing, which may be continued at pleasure. Flashes of light will be seen in the dark between the bells and the clappers; and if the electrification be strong, the discharge will be made without actual contact, and the ringing will cease. An apparatus of this kind, connected with one of the conductors that are erected for securing buildings from lightning, will serve to give notice of the approach and passage of an electrical cloud.

BELL-*glass*, in *Chemistry*, a convenient vessel for many chemical operations, particularly upon gaseous bodies. It has the advantage of not being easily overthrown, and is readily manageable by the knob of glass at the top. When used, it is always inverted or standing with the open end downwards. See *Plates* in *Chemistry*.

Chemical bells are a sort of receptacles chiefly used in preparing the oil or spirit of sulphur, for gathering and condensing fumes into a liquor.

BELL, in *Building*, is used to denote the body of the Corinthian and Composite capital, by reason of its resemblance to the figure of a bell inverted. In this sense, bell is the same with what we otherwise call *vase* and *tambour*, sometimes also *corbeil*. The naked of the bell is always to be even and perpendicular with the bottom of the flutings of the column.

BELL *flower*, in *Botany*. See CAMPANULA.

BELLS, *hair*. See HYACINTH.

BELL-*metal*, an important alloy, composed principally of copper and zinc. See COPPER.

BELL-*Animal*, in *Zoology*, a name given by some of the early writers on microscopical discoveries, to creatures of the Hydra genus. The bodies of these animals are shaped like bells, and they have very long and slender tails, by which they fasten themselves to the roots of little plants. They are usually found in great numbers together, in a sort of clusters or bunches; and all of the same bunch have always the same motion, very frequently contracting themselves, and afterwards expanding all together to the full length of their tails. They usually contract instantaneously; but are more slow in the expanding themselves again. Baker's Microf. p. 90. See HYDRA.

BELL-*muschus*, in *Botany*, a name given by some authors to the plant called *hamia moschata*, and mosch-seed.

BELL-*pepper*. See CAPSICUM.

BELL-*polype*, in *Zoology*, is the name applied to one particular species, the extremities of whose branches resemble bells, and which is now called *Vorticella Umbellaria*.

BELL-*weed*, an English name used by some authors for the JACEA-*nigra*, or common knap-weed, called also by many English writers *Matfelon*.

BELLA, STEFANO DE LA, in *Biography*, an eminent engraver, was born at Florence in 1610, and after having been for some time employed in the business of his father, who was a goldsmith, applied to the study of engraving, and became the disciple of Canta Gallina. At first he imitated the manner of Callot, who had been a disciple of the same master; but acquiring a facility in handling the point, he adopted a manner of his own, which is said to have surpassed, in freedom and spirit, that of Callot. At Paris, whither he removed in 1642, he formed an acquaintance with Israel Silvestre, and was much employed by Henriete, the uncle of Silvestre. Upon his return to Florence, he obtained a pension from the grand duke, and was appointed to instruct the prince Cosmus, his son, in the art of design. But being habitually subject to violent pains in the head, they at length terminated his life in 1664. The free and masterly etchings of this excellent artist are well known; and his distinguishing excellence consists in the freedom of his point, and the lightness and elegance of his figures. He drew correctly, and with great taste; and his works display much genius and great fertility of invention. Their slightness is compensated by their fire and animation. He is said to have engraved 1400 plates; among which are, "Six Views of Livourne;" several sets of "Shipping;" "A Holy Family;" several "Madonas;" a "View of Pont-neuf, at Paris;" "St. Prosper," a scarce print; five small ovals, in which is represented "Death carrying away persons of various ages;" "Death mounted on the skeleton of a horse;" "Parnassus;" and the "Rock," both scarce; "Animals;" "Beggars;" and various sets of "Hunting;" "Shipping;" "Landscapes;" "Ornaments," &c. Strutt.

BELLA POLLA, or TERRA POLLA, in *Geography*, a small high island, resembling two islands with lofty round hills, 10 leagues N. E. by N. from cape Angelo, and 4 leagues N. N. W. from Grava island; situate on the coast of the Morea in the Archipelago.

BELLA, in *Entomology*, a species of PHALÆNA (*bombyx,*) found in North America. The wings are yellow, with six rows of black dots: posterior wings red, with black tips. *Linn. Mus. Lud. Ulr.*

BELLABRE, in *Geography*, a town of France, in the department of the Indre, and chief place of a canton, in the district of Le Blanc. The place contains 895, and the canton 6672 inhabitants: the territory includes 300 kiliometres and 11 communes.

BELLAC, a town of France, and principal place of a district, in the department of the Upper Vienne, seated on the Vincon. It derives its name from an old fortified castle, erected in the 10th century, and contains about 2500 inhabitants. The place contains 3901, and the canton 10,854 inhabitants: the territory includes 255 kiliometres and 9 communes. N. lat. 46° 7′. E. long. 0° 57′.

BELLADAC, a town of Asia, in the province of Diarbekir, 45 miles west of Rabba.

BELLADONNA *lily*, in *Botany*. See AMARYLLIS.

BELLADONNA, a name given by the Italians to the *deadly nightshade*, because the ladies make a cosmetic of the juice, or distilled water, which they use to make their complexion fair and white. Ray.

Others derive the name from the intoxicating quality of this plant: "Quod insomnis pulchras ostendat virgines feminasque." Bod. Comment. in Theophrast. 10, 8. See ATROPA.

BELLADONNA,

BELLADONA, in *Entomology*; *Papilio Cardui*, is described under this name in the Fauna Suecica. Linn. i. n. 778.

BELLAIRE, in *Geography*, a poſt town of America, near the centre of Harford country in Maryland, and the chief town of the country. It contains a court-houſe and jail, and has but few inhabitants. Diſtant from Harford 6 miles, N.W. 22. N. E. from Baltimore, and 86 W. S. W. from Philadelphia.

BELLANO, a town of Italy, in the Milaneſe, 17 miles north of Como. It is ſituated at the foot of a lofty precipice; rent from top to bottom by a chaſm, through which a furious torrent forces its way. A bridge is thrown acroſs the chaſm, from which the ſpectator looks down into a deep gulf, and an aqueduct is conducted along the ſteep ſides of the rock.

BELLARGUS, in *Entomology*, a ſpecies of PAPILIO (Plebeius.) deſcribed by Eiper; and is *Papilio Adonis*, Gmel, &c.

BELLARMIN, ROBERT, in *Biography*, a cardinal of Rome, and one of the moſt famous controverſial writers of his time, was born at Monte Pulciano, a town of Tuſcany, in 1542, and entered into the ſociety of the Jeſuits in 1560. He was ordained prieſt by Janſenius in 1569, and in the following year advanced to the theological chair in the univerſity of Louvain. Having remained ſeven years in the Low Countries, he returned to Italy, and in 1576, began to read lectures at Rome on controverſial ſubjects; and having been honoured by three ſucceſſive popes with important commiſſions, he was, in 1598, nominated to the cardinalate by Clement VIII. with this diſtinguiſhing eulogium: "We chooſe him becauſe the church of God does not poſſeſs his equal in learning." In 1602, he was created archbiſhop of Capua; and it is ſuppoſed he would have been raiſed to the papal chair, if he had not been a Jeſuit. In about four years he reſigned his archbiſhopric, upon being recalled to Rome by pope Paul III. and here he continued his ſervices to the church, till the year 1621, when he retired from the Vatican to a houſe of his order, in which he died the ſame year, at the age of 79. When he was viſited in his laſt illneſs by pope Gregory XV. he expreſſed his profound veneration for the pontiff, as Chriſt's vicar on earth, by ſaluting him on his entrance with the words of the centurion to Chriſt: "Lord, I am not worthy that thou ſhouldeſt come under my roof." On the day of his funeral it was neceſſary to keep off the populace by a military guard, as they preſſed on, either to touch his body or to procure ſome relic of his garments, as if he had been a ſaint.

Bellarmin was a very ſtrenuous defender of the catholic religion againſt the reformers; and for ſome years his arguments were ſelected by proteſtant divines as ſpecial objects of refutation. His famous work is "A Body of Controverſy," written in Latin, and frequently reprinted; of which the laſt edition is that of Prague in 1721, 4 vols. folio. The ſtyle of this work, without pretending to purity or elegance, is perſpicuous, preciſe, and free from ſchool-day barbariſm. His reaſoning is diſtinct and methodical; and his ſtatements of the opinions and objections to his adverſaries are ſo fair and ſo forcible, that it has been queſtioned by ſome of his own party, whether his works were not likely to do more harm than good. In his proofs and refutations, however, he is very copious; and diſplays a great knowledge of ſcripture, of antiquity, in the compoſitions of fathers and councils, and in the doctrine and practice of the church in all ages. In writing controverſially, he does not ſtand every point by authority, and even by reaſoning. With reſpect to the doctrine of purgatory and indulgences, he is more a Proteſtant than a Jeſuit; and does not ſtand up for that laxe morality which was inculcated by ſome of his own order. Beſides this principal work, he wrote "A Commentary on the Pſalms;" "Sermons;" "A Treatiſe on Eccleſiaſtical Hiſtories;" "A Treatiſe on the Temporal Authority of the Pope," againſt Barclay; "The Groans of the Dove;" "On the Obligations of Biſhops;" and "A Hebrew Grammar." Some of his works, and particularly his book on the temporal authority of the pope, raiſed adverſaries againſt him in his own communion, whilſt his declaration of the right of the pontiffs to depoſe princes, cauſed it to be condemned by the parliament of Paris; his aſſertion of the indirect power of the popes in temporal matters, ſo offended the court of Rome, that Sixtus V. cauſed it to be inſcribed in the Index of the Inquiſition. Some proteſtants, by exceſs of zeal, injured their own cauſe, by circulating unfounded and malignant calumnies againſt his morals, &c. Joſeph Scaliger has even aſſerted, that he did not believe a word of the doctrines he defended, whereas it is moſt probable that he inclined to ſuperſtition in faith, and to ſcrupuloſity in practice. At his death he bequeathed one half of his ſoul to the Virgin Mary, and the other half to Jeſus Chriſt; and it is ſaid, that he would not allow the vermin that infeſted his body to be moleſted; under the plea, that theſe animals had no other paradiſe than their preſent exiſtence, of which it was cruel to deprive them. His right to canonization was ſtrongly urged; and the popes were prevented from allowing his claim merely by the fear of giving offence to thoſe ſovereigns whoſe temporal rights he had oppoſed. Gen. Dict. Nouv. Dict. Hiſt. Moſheim. Eccl. Hiſt. vol. iv. p. 221, &c.

BELLAS, in *Geography*, a ſmall town of Portugal, in Eſtremadura, containing about 1240 inhabitants.

BELLATOR, in *Entomology*, a ſpecies of CIMEX (ſpinoſus). It is brown above, beneath yelloviſh: antenæ black annulated with white. Gmelin. A native of Cayenne. This is *Coreus Bellator* of Fabricius.

BELLATRIX, in *Aſtronomy*, a ruddy, glittering ſtar of the ſecond magnitude, in the left ſhoulder of ORION.

It takes its name from *bellum*, as being anciently ſuppoſed to have great influence in kindling wars, and forming warriors.

BELLAY, WILLIAM DU, in *Biography*, a French general, ſignalized himſelf in the ſervice of Francis I. by his valour as an officer, and by his talents as a negociator. He was aſſiduous and ſucceſſful in his efforts for inducing ſome of the univerſities of France to pronounce judgment in favour of the divorce of king Henry VIII. from his queen Catharine; and he was employed in ſeveral embaſſies to Germany for the purpoſe of conciliating the princes of the proteſtant league, and evading their objections againſt the king his maſter's ſeverity in puniſhing heretics. Bellay was eminently diſtinguiſhed for his addreſs in penetrating, by his ſpies and intrigues, into the deſigns of the enemy; he ſucceeded in Piedmont, whither he was ſent in quality of viceroy, and took ſeveral towns from the Imperialiſts. Being deſirous of communicating in perſon ſome important intelligence to the king, and being very infirm, he ordered a litter for his conveyance; but having paſſed the mountains of Tarare, betwixt Lyons and Rome, he was under a neceſſity of ſtopping at St. Zaphorin, where he died January 10th 1543. He was buried in the church of Mans, and a noble monument was erected to his memory. He was the author of ſeveral works; of which the principal was "The Hiſtory of his own Times," in Latin and French, which he divided into ogdoades, or different parts, each conſiſting of eight books. Of this work ſome few fragments only remain, preſerved by his brother Martin Du Bellay, in his "Memoirs from 1513 to 1543." They are written in a ſimple and lively manner, but are ſomewhat partial in favour of Francis I.

Bellay

Bellay was one of the first French writers who expressed a doubt of the miraculous facts recorded of Joan of Arc. Gen. Dict.

Bellay, *John du*, a cardinal, younger brother of the preceding, was born in 1492; and having made considerable proficiency in literature, was highly esteemed by Francis I. By him he was employed in several embassies, particularly in negociating a reconciliation between Henry VIII. of England and the see of Rome; and he was advanced by him to several considerable preferments. Bellay, in the business of king Henry, visited the pope at Rome, where he continued, and in 1535, he was made cardinal by Paul III. As soon as he received intelligence of the hostile designs of Charles V. he returned to France, and resisted that prince's invasion of Provence in 1536, as the lieutenant-general of Francis, with as much military vigour as prudence, and he exerted himself in putting the metropolis, and other places in Picardy and Champagne in a formidable state of defence. After the death of Francis I. his credit declined by the intrigues of the cardinal of Lorraine, and retiring to Rome, he resigned his preferments to France, and was made bishop of Ostia. He was so much respected by his brother cardinals, that they had thoughts of raising him to the pontificate, when he died in 1560 at Rome, aged 68 years. Bellay was distinguished as a patron of literature; and by his advice, in concurrence with that of Budæus, Francis I. founded the royal college in 1529. He was an elegant writer, both in Latin and in French. In the Latin language he wrote some harangues, and an apology for Francis I. and in the latter three books of poems, consisting of elegies, odes, and epigrams, published by R. Stephens, in 1546. Gen. Dict.

Bellay, *Joachim du*, a French poet, was born at Lire in Anjou, about the year 1524; and amidst various domestic misfortunes, which marked his earlier years, he directed his attention to the study of the ancient and modern poets. At length his own performances in verse made him known at court, and he became the delight of Francis I. Henry II. and Margaret queen of Navarre. He was characterised by the appellation of the "French Ovid," which seemed to have not improperly been bestowed upon him, on account, partly, of the sweetness and facility of his muse, and partly of the licentiousness of some of his pieces. In the sonnet he particularly excelled, and a rank has been assigned to him as a poet next to that of Ronsard. He followed his relation the cardinal to Rome; and on returning with him to France as his agent, he lost his favour in consequence of charges of irreligion and immorality that were alleged against him. But another relation, who was bishop of Paris, gave him a canonry in his church in 1555, and he had the prospect of further preferment; but was carried off by an apoplexy, January 1, 1561. His French poems were published in 1561, and his Latin ones in 1561. Nouv. Dict. Hist.

BELLE de Nuit, in *Botany*, a name which the French give to the flower of the Jalap.

Belle *bay*, in *Geography*, a harbour on the N. E. part of the great bay, called Fortune bay, on the south coast of the island of Newfoundland, in the Atlantic ocean.—Also, another bay on the N. W. side of the same island, 6 or 8 leagues N. W. from the bay of Isles, and about as much S. W. from the small bay of Higournachet.

Belle *Dune*, *La*, or *Handsome Town*, a long projecting barren point, on the south side of Chaleur bay in North America, about 8 leagues N. N. W. of Nipisiguit, where temporary cod and herring fisheries are carried on by different people; no trade being established at the place.

Belle *isle*, *Belleisle-en-Mer*, or *Bellisle*, an island in the bay of Biscay, near the W. coast of France; about 9 miles long, and from 2 to 4 broad, surrounded by steep rocks, which together with the fortifications, render the conquest of it difficult. It was taken by the English in 1761, but restored at the peace in 1763. The soil is various, rocky, with salt marshes, and some fertile grounds. Besides Palais, the capital, it contains three other small towns, and about twenty villages. N. lat. 47° 17′ 30″. W. long. 3° 6′ 30″.

Belle-*isle-sur-Mer*, in the department of Morbihan, and chief place of a canton, in the district of L'Orient, by the late French arrangement, contains 2496, and the canton 5569 inhabitants: the territory includes 105 kiliometres and 5 communes.—Also, a small island of France, in the river Loire, in the department of the Mayenne, half a league west of St. Mathurin.—Also, an island on the east side of the northern part of Newfoundland, east of Canada-head between 50° 4′. and 50° 50′. N. lat. and between 55° 39′. and 55° 46′. W. long.—Also, an island of North America, at the mouth of the straits of this name, between the country of the Esquimaux, or New Britain, and the north end of Newfoundland. The island is about 7 leagues in circuit, and lies 16 miles from the nearest land on the coast of Labrador, or New Britain. On the north-west side it has a harbour for fishing vessels, or small craft, called "Lark harbour;" and, on the E. point, it has another small harbour or cove, which will admit shallops. The narrow channel betwixt Newfoundland and the coast of Labrador, called the "Straits of Belle Isle," receive several rivers from the coast of Labrador. These straits lead into the gulf of St. Lawrence from the N. E. and are distant 5 leagues N. from Newfoundland. The north point of the island is in N. lat. 51° 57′. and the south point in N. lat. 51° 48′. and W. long. 55° 40′.—Also, an island of Ireland in lough Erne, in the county of Fermanagh, 6 miles S. E. of Enniskillen.

Belle-*isle-en-Terre*, a town of France, in the department of the Northern coast, and chief place of a canton, in the district of Guingamp. Seated on an island in the river Guer; 3 leagues west of Guingamp. The place contains 812, and the canton 9118 inhabitants: the territory includes 152½ kiliometres and 6 communes.

Belle *plaine*, a valley of Piedmont, in the Alps, situate partly in the county of Nice, partly in the county of Tenda, a few miles N. W. of Saorgio.

BELLDEFENSE, a town of France, in the department of Côte-d'or, and chief place of a canton, in the district of Beaune. The place contains 1717, and the canton 10,324 inhabitants: the territory includes 215 kiliometres and 17 communes.

BELLEFOREST, *Francis du*, in *Biography*, was born at a village called Sarzan, in the province of Guienne in 1530, and after an early education in the court of Navarre, was sent to study the law at Toulouse. But employing himself in writing panegyrics in bad verses, on all the noblesse in and about Toulouse, by whom he was rewarded with praise and entertainment, he removed to the capital: and by attention and industry attained to some reputation in the reigns of Charles IX. and Henry III. so that he gained the post of historiographer-royal, which he afterwards lost for want of paying due regard to fact in his productions. He is said to have composed more than 50 works on different subjects, during a life of 53 years, as he died at Paris in 1583. It is related of him, that there was neither tongue nor science which he did not profane. His most fertile topic was history: and he published compilations of "Tragical Histories;" and "Wonderful Histories." The only two works worth recording are, "The History of the nine Kings of France, of the Name of Charles," folio; and "The Annals of general History of France,"

France," Par. 1620, 2 vols. folio, in which last work are several curious facts, intermixed with fables, and therefore having no authority. Gen. Dict. Nouv. Dict. Hist.

BELLEGARDE, Jean-Baptist Morvande, usually called the "Abbe," was born of a family of rank in the diocese of Nantes in 1648, and entered into the society of the Jesuits. His taste and style were formed by father Bouhours, under whom he ranked as a disciple. Attached to the principles of Descartes, which were opposed by them, he abandoned the society of Jesuits, after continuing in it 16 or 17 years, and taking priest's orders; and entered into the world, preaching occasionally with applause, but devoting himself chiefly to the profession of an author. Under this character he wrote many books, and supported himself chiefly by the profits accruing from them, distributing to the poor every thing that exceeded a bare maintenance. Some time before his death he desisted from his literary labours, sold his books, and retired to the community of St. Francis de Sales at Paris, established for the support of poor priests, and here he died in 1734. His voluminous publications consist chiefly of translations from the works of St. John Chrysostom, St. Basil, St. Gregory Nazianzus, St. Ambrose, Thomas à Kempis, &c. and also from Ovid, Virgil, and other profane writers. His style is pure and elegant; but he often mistakes the sense of his author, especially of the Greek fathers. The subjects of his original works are, in general, morals, and matters of taste. Those that have been most favourably received are, "Reflections on Ridicule;" "Reflections on what may please and displease in the Commerce of the World;" and "Reflections on Elegance and Politeness of Style." These, and some other pieces, form a collection of 14 small volumes. Nouv. Dict. Hist.

Bellegarde, in *Geography*, a fortified town of France, in the department of the Aveiron; it was taken by the Spaniards in 1674, and retaken the following year by marshal Schomberg. After the peace of Nimeguen, Louis XIV. built a regular fortress with five bastions to defend the Pyrenees; 5 leagues S. of Perpignan.—Also, a town of France, in the department of the Loiret, and chief place of a canton, in the district of Monturgis. The place contains 754, and the canton 5791 inhabitants: the territory includes 172¼ kilometres and 12 communes.—Also, a town of France, in the department of the Creuse, and chief place of a canton, in the district of Aubusson; 2 leagues east of Aubusson. The place contains 1024, and the canton 7638 inhabitants: the territory includes 165 kilometres and 9 communes.

BELLELAY, a small town or village of Germany, in the circle of the Upper Rhine, and bishopric of Bale, with a rich abbey of Benedictines. It is distant about 20 miles from Porentru, in a solitary and unpleasant situation, surrounded by mountains and sheltered by forests. In this place is instituted a military academy for young nobility and gentry.

BELLEM. See Belem.

BELLEN, a town of Switzerland, in the canton of Schweitz; 9 miles N. E. of Zug.

BELLENAVE, a town of France, in the department of the Allier, and chief place of a canton, in the district of Gannat, 3 leagues N. W. of Gannat.

BELLENCOMBRE, a town of France, in the department of the Lower Seine, and chief place of a canton, in the district of Dieppe, 3 leagues west of Neufchatel, and 5 S.S.E. of Dieppe. The place contains 212, and the canton 8085 inhabitants: the territory includes 162¼ kilometres and 27 communes.

BELLENDEN, William, (*Bellendenus*, Lat.) in *Biography*, a man of extensive reading and refined taste, was born in Scotland, and flourished in the beginning of the 17th century. He was professor of the Belles Lettres in the university of Paris in 1602, and continued for a considerable time in that capital, even after he was made master of the pleas or requests to king James I. of England. At Paris he published, in 1608, his "Cicero Princeps," containing a body of extracts from Cicero's writings, relative to the maxims of monarchical government, and the duties of a prince. This work he dedicated to Henry, prince of Wales, and he prefixed to it a treatise "De Processu et Scriptoribus Rei politicæ," in which there is a rich vein of masculine sense and fervent piety. The origin of our errors in religion, and of our defects in policy and morals, is traced out with considerable accuracy and learning. But while the author condemns the monstrous tenets of ancient idolatry, and the gross corruptions of philosophy, he bestows many just encomiums on the wisdom and the patriotism of some ancient legislators. In 1612, the author published a work similar to the former, under the title of "Cicero Consul, Senator Senatusque Romanus;" on the nature of the consular office, and the constitution of the Roman senate. Encouraged by the reception given by the public to these works, he conceived the plan of a third work, "De Statu prisci Orbis," which was to contain a history of the projects of government and philosophy from the antediluvian times to their various degrees of improvement under the Hebrews, Greeks, and Romans. This work was dedicated to Charles, prince of Scotland and Wales; but when he had proceeded so far as to print a few copies of this work, in the year 1615, it was suggested to him, that his three treatises, "De Statu Principis;" "De Statu Reipublicæ;" and "De Statu Orbis," being on similar and connected subjects, might be united in one work; accordingly they were republished in this form under the title of "Bellenden de Statu," in 1616. Bellenden afterwards projected a more extensive work, "De Tribus Luminibus Romanorum," in which Seneca and Pliny were to be joined to Cicero; but death prevented the execution of his whole plan. He was an elegant writer, and a man of extensive knowledge and sound judgment. His Latin style is formed upon that of Cicero; and he embraces every opportunity of interweaving the most choice and proper phraseology from the Roman orator, even whilst he is expressing his own sentiments, so that it is not always easy to distinguish sentences cited from Cicero, from his own language. The book "De Statu," was reprinted in London in 1787, 8vo. by an anonymous editor, (supposed to be the learned Dr. Parr,) with a Latin preface by the editor, relating to the politics and public characters of that period, and beautiful engravings of Mr. Burke, lord North, and Mr. Fox, to whom the three treatises are respectively dedicated. To preserve the memory of every composition which flowed from the pen of Bellendenus, the editor has inserted an epithalamium on the marriage of Charles I. and a "panegyricum carmen" on the embassy to Spain. These verses were found in the British Museum.

The editor owns his firm conviction that Dr. Middleton, in his celebrated history of Cicero, was much indebted to the writings of Bellendenus, although he has never mentioned his name. Pref. to Bellendenus de Statu. Monthly Review, vol. lxxvi. p. 491, &c. vol. lxxvii. p. 504, &c.

BELLEREAU, in *Geography*, a town of France, in the department of the Meurte, and chief place of a canton, in the district of Nancy, 2 leagues S. E. of Pont-a-Mousson.

BELLEROPHON, in *Fabulous History*, the son of Glaucus, king of Ephyrax or Corinth, was contemporary with Jason. Under a charge of homicide, as some say, on his own brother, he was forced to retire to the court of Prætus, king of Argos, where he was accused by Sthenobœa, or as Homer says, Antæa, the wife of Prætus, of an attempt upon her chastity. For this insult Prætus sent him to Jobates, his father-

father-in-law, king of Lycia, with private instructions to put him to death. Jobates demurring against the execution of these orders, employed him in several dangerous expeditions against the Solymi, and against the Amazons, from which he returned victorious. Having thus ingratiated himself with Jobates, he obtained his daughter in marriage, and a settlement in a fertile part of Lycia, where he reigned and brought up his family. From Homer's account, which represents him as "hated by the gods, and wandering in the Aleian plain, a prey to melancholy, and avoiding all commerce with men," he seems to have become insane, and to have died in that state. To his various exploits Homer and other writers have annexed the story of his killing the triform monster called the Chimæra, by the assistance of the flying horse Pegasus, granted him by Minerva and trained for his use. Of the numerous conjectures that have been offered for the explication of this fable, we shall only mention that of Bochart, (Phaleg. l. i. c. 6.) who suggests, that in his expedition against the Solymi, he overcame them, and also their three gods, which they painted on their ensigns, in the several forms of a lion, a goat, and a dragon; and which he probably joined together on his own, in memory of his conquest; and this gave birth to the fable of his killing the monster Chimæra. Homer. Iliad. vi. Anc. Univ. Hist. vol. v. p. 97, &c.

BELLES LETTRES, considered as synonymous with *polite literature*, however vaguely and indefinitely these terms have been often used, properly comprehend those subjects that relate to man as a being endowed with senses of taste and imagination, which were intended to embellish his mind, and to supply him with rational and useful entertainment. In this restricted sense they include the origin, structure, and various kinds of language, or grammar, universal and particular, criticism, rhetoric in its whole extent of composition, style, and elocution; history, in its several departments, ancient and modern, general and special, and all the different kinds of poetry. In the distribution of the Lyceum of Arts, established at Paris in 1792, the belles lettres comprehend general grammar, languages, rhetoric, geography, history, antiquities, and numismatography; whereas, those parts of learning that are of a more grave, sublime, or abstruse kind, and that are more immediately the objects of the understanding, such as logic, metaphysics, ethics, and the various branches of the mathematics and natural philosophy, are usually referred, by way of distinction, to the class of sciences. This distinction, however, is not rigidly observed, even by Rollin and others, who professedly treat of the belles lettres. In their confined and appropriate meaning, they open a field of investigation peculiar to themselves. Their province comprehends every thing that relates to beauty, harmony, grandeur, and elegance; every thing that can soothe the mind, gratify the fancy, or move the affections. They present human nature under a different aspect from that which it assumes, when viewed by other sciences. They bring to light various springs of action, which, without their aid, might have passed unobserved; and which, though of a delicate nature, frequently exert a powerful influence on several departments of human life. Such studies have also this peculiar advantage, that they exercise our reason without fatiguing it. They lead to enquiries acute, but not painful; profound, but not dry or abstruse. They strew flowers in the path of science; and while they keep the mind bent, in some degree, and active, they relieve it at the same time from that more toilsome labour to which it must submit in the acquisition of necessary erudition, or the investigation of abstract truth. Besides, the study of polite literature furnishes an agreeable amusement for those intervals of leisure which occur in every man's life; and thus prevents his being a burden to himself, or recurring to the indulgence of pernicious passions, and the pursuit of licentious pleasures. The satisfactions which this study imparts, occupy a kind of middle station between those of mere sense and those of pure intellect: they refresh the mind after the toils of intellect, and the labours of abstract study; and they gradually raise it above the attachments of sense, and prepare it for the enjoyments of virtue. Of those, whose minds in early life incline to polite literature, good hopes may be entertained, as this liberal and elegant turn is favourable to many virtues; whereas, to be entirely void of relish for eloquence, poetry, or any of the fine arts, is an unpromising symptom of youth, and furnishes suspicions of their being prone to low gratifications, or destined to drudge in the more vulgar and illiberal pursuits of life. A cultivated taste increases sensibility to all the tender and humane passions, by giving them frequent exercise, while it tends to weaken the more violent and fierce emotions:

"——Ingenuas didicisse fideliter artes,
Emollit mores, nec sinit esse feros."

"These polish'd arts have humaniz'd mankind,
Soften'd the rude, and calm'd the boist'rous mind."

The elevated sentiments and high examples which poetry, eloquence, and history, are often bringing under our view, naturally tend to nourish in our minds public spirit, the love of glory, contempt of external fortune, and the admiration of what is truly illustrious and great. Although it should not be said that the improvement of taste and virtue are the same, or that they may be always expected to co-exist in an equal degree; yet it must be allowed, that the exercise of taste is, in its native tendency, moral and purifying. From reading the most admired productions of genius, in poetry or in prose, almost every one rises with some good impressions left on his mind; and though these may not always be durable, they are at least to be ranked among the means of disposing the heart to virtue. Indeed, without possessing the virtuous affections in a strong degree, no man can attain eminence in the sublime parts of eloquence. He must feel what a good man feels, if he expects greatly to move, or to interest mankind. They are the ardent sentiments of honour, virtue, magnanimity, and public spirit, that only can kindle that fire of genius, and call up into the mind those high ideas, which attract the admiration of ages; and if this spirit be necessary to produce the most distinguished efforts of eloquence, it must be necessary also to relishing them with proper taste and feeling. Blair's Lectures on Rhetoric, and Belles Lettres, vol. i. lect. 1. Rollin's Method of treating and studying the Belles Lettres, vol. i. p. 3, &c. M. de Rosenstein's Oration, delivered before the Swedish Academy, translated by N. G. Agander.

BELLESME, in *Geography*. See Belesme.

BELLEVILLE, a town of France, in the department of Paris, and chief place of a canton, in the district of St. Denis, half a league east of Paris.—Also, a town of France, in the department of the Rhone, and chief place of a canton, in the district of Villefranche, 2½ leagues north of Villefranche.—The place contains 2039, and the canton 11,528 inhabitants: the territory includes 145 kilometres and 12 communes.—Also, a town of France, in the department of Vendée, and the district of Montaigne, one league north of La Roche-sur-Yon.

BELLEVOIS, in *Biography*, a painter of sea-pieces, known through all parts of Europe as a good painter, died in 1684. His subjects are views of havens, sea-ports, shores, calms, and storms at sea; but in his calms he shews his peculiar excellence. His touch is light, and his colouring clear; the perspective of his sea-ports and buildings is true, and has an agreeable effect; his skies are generally bright, and judiciously

judiciously managed; and his colouring is transparent. His figures are indifferent, and without much expression. His pictures occur in public sales, and some of his best style fetch a tolerable price. Pilkington.

BELLEVUE, or *les-Bains*, in *Geography*, a town of France, in the department of the Saone and Loire, and chief place of a canton, in the district of Charolles. The place contains 2800 and the canton 9406 inhabitants: the territory includes 322½ kiliometres and 13 communes.

BELLEY, Lat. Belica, a town of France, and principal place of a district in the department of the Ain, before the revolution the capital of Le Bugey, and see of a bishop, seated among hills and small eminences, about 2 miles from the Rhone, and twelve miles east of Lyons. The place contains 3727 and the canton 12,118 inhabitants: the territory comprehends 195 kiliometres and 22 communes. N. lat. 45° 45′. E. long. 5° 55′.

BELLGROVE, a town of America, in Bergen county, New Jersey, on the road to Albany, within half a mile of the line that separates New York from New Jersey, which extends from Delaware river to that of Hudson; distant 24 miles N. by W. from the city of New York.

BELLI, in *Modern History*, the name of a society or sect among the Negroes of Africa, in the interior kingdoms of Sierra Leona, which is properly a school or seminary for the education of children, renewable every 25th year by order of the king, who is visitor or superior of the college. Here the young men learn to dance, fight, fish, hunt, and above all, to chant a certain hymn, which, in the language of the college, they call "bellidong," or the praises of belli: these songs consist only of a repetition of the same lewd expressions, enforced by the most indecent and lascivious postures. When a young negro is become an adept in this practice, he is admitted a fellow of the college, deemed to be qualified for all employments, temporal and spiritual, and entitled to a number of important privileges.

BELLICA *columna*, in *Antiquity*, a column near the temple of Bellona, from which the consuls or feciales cast javelins towards the enemy's country, by way of declaration of war.

BELLICOSUS, in *Entomology*, a species of Cimex, (*collengus*,) that inhabits Africa. It is of a brown colour: posterior thighs arched, and dentated; and four spires on the abdomen. Fabricius. Gmelin.

BELLICULI, or Bellirici *Marini*, among *Naturalists*, denote a species of sea-shells of an umbilical figure, sometimes of a white colour, spotted with yellow; and sometimes of a yellow, streaked with black lines, after the snail fashion.

BELLIDIASTRUM, in *Botany*. See Doronicum.

BELLIDIOIDES. See Chrysanthemum.

BELLIEVRE, Pompone Da, in *Biography*, chancellor of France, was born at Lyons in 1529, studied at Toulouse and Padua, and in 1575 became superintendent of the finances, and in 1579 president of the parliament of Paris. Having been employed in several important embassies by Charles IX. and Henry III. and IV. he was created chancellor by the latter in 1599, as a recompence for his services at the peace of Vervin. In the execution of his office he was enlightened, inflexible, inclined to austerity, and, by the warmth of his temper, to occasional precipitance. He was distinguished by his learning and eloquence, as well as by his talents for business. In 1604, he lost the seals, but continued in the posts of chancellor and president of the council; however, he used to say, regretting his loss, "that a chancellor without the seals was a body without soul." He died in 1607; and several eulogies were bestowed on his memory, in honour of the regard which he always testified to learning and its professors. The grandson of the former was distinguished, in the reigns of Louis XIV. and XV. by his legal and diplomatic talents; and was founder of the general hospital at Paris. Nouv. Dict. Hist.

BELLIMO, in *Modern History*, a mode of trial, or a kind of purgation, practised by the Negroes in the interior countries of Africa, when persons are accused of murder or theft, and consisting of a composition of certain herbs or barks of trees, which they oblige the accused to hold in his hand, under a full persuasion, that, if he be guilty, blisters will immediately rise upon the skin. Sometimes the bellimo consists in obliging the accused to swallow a large glass of a liquor composed from the bark of the neno and quoni trees, which the negroes believe to be virulently poisonous. The innocent immediately reject it by vomit; but the guilty shew a froth about the mouth, and are accordingly judged worthy of death.

BELLING *of Hops*, denotes their opening and expanding to their customary shape, supposed to bear some relation to that of a bell. Hops blow towards the end of July, and bell the latter end of August or the beginning of September.

BELLINGHAM, in *Geography*, a small town of Northumberland, England. It has a market on Tuesday, one fair annually, and is 300 miles north of London. In 1780, this town was nearly consumed by fire, and its houses now only amount to 70, and inhabitants to 337. About four miles to the south is the village of Wark, where are the keep and some ruins of an ancient castle.

Bellingham, a small farming township of America, in Norfolk county, Massachusetts, containing 735 inhabitants, 20 miles N. from Providence, and 34 S. from Boston.

BELLINI, Laurence, in *Biography*, a learned and ingenious physician, was born at Florence in 1643. He had the advantage of being educated under Manchetti, Redi, and Borelli, and profited so well by their instructions, that he was made professor in mathematics and philosophy at Pisa, when he was only twenty years of age. He was also no mean proficient in oratory, poetry, and music, but proposing to practise medicine, he was soon advanced to the chair of professor in anatomy, a post he continued to fill with reputation for near thirty years. He was one of the principal supporters of the medico-mathematic school, who attempted to explain the functions of the body, the causes of diseases, and the operations of medicines on mechanical principles. In this he was followed by Archibald Pitcairne, who read his works at the schools in Edinburgh during the life-time of Bellini, and dedicated one of his own works to him. When he was fifty years of age, he was called to Florence, by Cosimo III. who appointed him his physician, and about the same time, on the recommendation of Lancisi, he was made honorary, or consulting physician to pope Clement XI. but having more imagination than judgment, and endeavouring to square his practice to his theory, he was generally unsuccessful in his treatment of diseases, and thus soon forfeited the favour, Haller says, both of his prince and the public. In his anatomical researches he was more successful, as he was the first who accurately described the nervous papillæ of the tongue, and discovered them to be the organ of taste, of which he gave an account in his "Gustus Organum novissimé Deprehensum;" Bonon, 1665, 16to.; and he had before, viz. in 1662, published "De Structura Renum," Florent. 4to. which had been well received, as containing additional information on the anatomy of that organ. These works have been frequently reprinted, though now, from the great improvements that have been made in anatomy, but little noticed. In 1683, he published "De Urinis et Pulsibus:" De Missione Sanguinis;" "De Morbis Capitis et Pectoris;" being in act, distinct treatises on those subjects, 4to. Bonon. This is a work of much research and observation, though often obscure and too theoretical.

It was much celebrated in its time; and Boerhaave, who published an edition of it in 1717, accompanied it with a commendatory preface. For the titles of the remainder of Bellini's productions, see Haller's Bib. Med. et Anatom. He died in 1704. Gen. Biog.

Bellini, Gentile, a painter of history and portrait, was born at Venice in 1421, and instructed by his father Giacomo, who was himself an artist in the art of painting, both in distemper and in oil. He was employed by the doge to paint the hall of the great council, and he executed several considerable works for others of the nobility. His reputation reaching to the Ottoman court, he was invited by Mahomet II. to Constantinople, where he was honourably entertained, and employed in painting the portrait of the emperor, and in various other performances. It is said, however, that the emperor ordered the head of a slave to be cut off in the presence of Bellini, in order to convince him of the incorrectness of a picture which he had painted, of the decollation of St. John the Baptist; but the sight affected his mind to such a degree, that he was never easy till he obtained leave to return to his own country. Mahomet, before his departure, put a gold chain about his neck, and dismissed him with letters of recommendation to the senate of Venice, which procured for him a pension for life, and an admission into the order of St. Mark. Vasari mentions a sea-fight, painted by this master, which had extraordinary merit. He died in 1501. Pilkington.

Bellini, Giovanni, the brother of the former, was born at Venice in 1422, and surpassed both his father and brother in every branch of painting. He is accounted the founder of the Venetian school, by introducing the practice of painting in oil, which had been communicated to his father by Domenico and Andrea del Castagno, as some say; or which, according to De Piles, he obtained from Antonia of Messina: and by teaching his scholars to paint after nature, the school of Giovanni produced two memorable disciples, Titian, and Giorgione, who brought the art of colouring to its highest perfection; and Giovanni himself, by observing the works of these famous artists, improved his own manner very considerably; so that in his latter pictures the colouring is much better, and the airs of his head are noble, although his design is somewhat gothic, and his attitudes not well chosen. He died in 1512. Pilkington.

BELLINO, St. in *Geography*, a town of Italy, in the Polesino di Rovigno, 10 miles W. S. W. of Rovigno.

BELLINZONE, or Bellenz, one of the Italian bailliages of Swisserland, on the east side of the river Tesino, north of the lake Maggiore, or lake of Locarno, and on the confines of the Milanese, which, together with the two bailliages of Riviera or Polesi, and Val di Blenzo, Bregno or Brenna, comprehend 110 square geographical miles, and 33,000 inhabitants, and before the French revolution belonged to the cantons of Uri, Schweitz, and Underwalden. In the 15th century, this country belonged to the counts of Sax, who sold it in 1422 to the original cantons; but Philip Maria, duke of Milan, opposing this sale or exchange, exerted himself to prevent from falling into their hands a town like Bellinzone, so important from its situation and natural strength, to check their inroads and cover his dominions. Having therefore taken possession of it by force of arms, a body of 8000 Swiss passed the Alps. The force of both nations met; the Italians were led on by Carmagnola; a bloody battle ensued, of which both sides claimed the victory: but the Swiss retired with a standard taken from the enemy, and they remained masters of the town. In 1500, however, the three cantons obtained what they long contended for; the inhabitants of Bellinzone, vexed by the frequent changes in the Milanese, submitted to them. The French, when they had conquered the duchy, in vain reclaimed it; the Swiss retained possession; and the seven Italian bailliages, and this amongst the rest, were formerly ceded to them by Maximilian Sforza, in gratitude for their having reinstated him in the ducal seat. It was likewise made an article of the perpetual peace concluded between Francis I. king of France, and the cantons. The bailiff remains in office two years; he is nominated alternately by the three cantons, and is generally removed from Riviera the poorest, to Bellinzone, the most lucrative of the three governments. An appeal lies from his decision to the syndicate, and from that court to the three cantons: in ecclesiastical affairs, the inhabitants are cognizable to the bishop of Como, excepting three parishes. The inhabitants are catholics; and most of the natives understand Italian, but the language is a corrupt German. After the French revolution, Bellinzone, according to the division of 1798, became a distinct department or canton, including the bailliages of Bellinzone, Riviera, and Val Leventina, of which the chief town was Bellinzone. By the constitution of 1801, the Italian bailliages formed the 17th department or canton of Swisserland, and was empowered to send five representatives to the diet. The riches of this district consist in its pastures and cattle; the deficiency of corn is supplied by the Milanese; and the plain near Bellinzone produces good wine.

Bellinzone, or Bellinz, Lat. *Bilitio*, *Bilitiona*, *Beltiona*, or *Berinzona*, the capital of the above bailliage or department, is a beautiful town, situate at the foot of mount Cenero, on a delightful plain on the east side of the Tesino, a little below its junction with the Moesa or Musa, and about 5¼ British miles above the northern extremity of the lake Maggiore. The town is encircled with ancient walls and battlements in good repair; on the right are seen the majestic ruins of an ancient castle, and on the left, separately embosomed in trees, are the castles of the bailiffs of the three regent cantons, Uri, Schweitz, and Underwalden. The interior of Bellinzone is far from corresponding with its external beauty and situation; the streets being narrow, and the houses ill-built. It is, however, rich in fine churches, dedicated to St. Peter, St. Stephen, St. Blaise, and St. Rock; and it has numerous convents of Augustines, Ursulines, and Recollects. There is also a convent, or seminary, called the "Residence," lately founded for the education of youth. The valley that lies between this town and the lake is level, and laid waste by numerous torrents: the road runs along the sides of the hills through continued vineyards bounded on the west, and also on the east, by ridges which are clothed to their summits with woods of chesnuts and walnut trees, half concealing frequent spires and numerous hamlets. N. lat. 46° 4′ E. long. 8° 43′.

BELLIS, formed from *bellus*, pretty or handsome, Eng. *daisy*, Fr. *paquerette*, in *Botany*. Lin. gen. n. 962. Reich. 1042. Schreb. 1300. Tournef. 280. Juss. 183. Gærtn. t. 168. Class and order, *syngenesia polygamia superflua*. Nat. Ord. *Compositæ Discoideæ. Corymbiferæ*. Juss. Gen. Char. *Cal.* common, hemispheric, upright; leaflets ten to twenty in a double row, lanceolate, equal. *Cor.* compound radiate; corollules hermaphrodite, tubular, numerous in the disk; female ligulate, more in number than the leaves of the calyx in the ray:—proper of the hermaphrodite funnel-form, five-cleft: of the female ligulate, lanceolate, scarcely three-toothed. *Stam.* of the hermaphrodite filaments five, capillary, very short; anthers cylindric, tubular. *Pist.* germ ovate; of the hermaphrodite, style simple, stigma emarginate; of the female, style filiform; stigmas two, patulous. *Per.* none. *Calyx* unchanged. *Seeds* solitary, obovate, compressed; down none. *Rec.* naked, conical.

Ess. Char. *Cal.* hemispheric, with equal scales. *Seeds* ovate, with no down. *Rec.* naked, conical.

Species, 1. B. *perennis*, perennial or common daisy. Lin. Spec. 1248. Hudf. Angl. 370. Wither. Arr. 733. Hull. 184. Relh. 320. Sibth. 256. Abbot. 184. Curt. Lond. fasc. 1. 62. Fl. Dan. t. 503. Mor. Hist. s. 6. t. 8. f. 29. Petiv. Brit. t. 19. f. 2. Ger. 510. 4. Park. Theat. 530. 11. Raii Hist. 320. 2. Smith. 372. B. sylvestris minor. Raii Syn. 184. Ger. em. 636. Fuchs. Hist. 147. B. minor. Matth. Valgr. v. 2. 263. Primula veris. Trag. Hist. 161. β. B. hortensis, double or garden daisy. Mill. Dict. n. 3. Curtis Magaz. t. 228. Raii Hist. 350. n. 4. γ. B. fistulosa, quilled daisy. δ. B. prolifera, proliferous or hen and chicken daisy. "Scape naked." The common daisy is sufficiently distinguished by its creeping, ramose, and long fibred root; by its radical, depressed, obovate, crenate, and pilose leaves; by its erect, simple, single-flowered, round, and naked scapes; by its beautiful flower, with a conic, golden disk, and white, or more frequently reddish ray; by its linear-obovate, plane, emarginate, very numerous, patent floscule rays; by its compressed, hairy seeds; and by its conic, acute, punctated, concave receptacle. Smith. Flor. Brit. v. 2. 898. A native of most parts of Europe in meadows and pastures; flowering almost all the year, and shutting up close every night and in wet weather. The taste of the leaves is somewhat acrid, but in some countries used as a pot-herb. The roots have a penetrating pungency. It is ungrateful to cattle, and even to geese. It occupies a large share of pasture lands, to the exclusion of grass and [illegible] herbs. It has been much recommended for fresh wounds externally, and against inflammatory disorders internally; but it is now totally out of use. The varieties of the garden daisy are double-white, red, white, and red striped, variegated, scarlet and pied; double quilled, or with fistular florets; double cock's-comb shaped, white red and speckled; proliferous, chilling or hen chicken daisy. 2. B. *annua*, annual daisy. Lin. Spec. 1249. Syst. 770. "Stem somewhat leafy." A low annual plant, seldom rising more than three inches high, with an upright stalk having leaves on the lower part, and its upper part naked, supporting a single flower like that of the common daisy but smaller. A native of Sicily, Spain, about Montpellier, Verona, and Nice. Cultivated in 1759 by Miller.

Propagation and Culture. The garden daisies flower in April and May, and make a pretty variety when intermixed with plants of the same growth; they should be planted in a shady border and a loamy soil without dung, on which they may be preserved without varying, provided the roots are transplanted, and parted every autumn. They should be kept clean from weeds. They were formerly planted for edgings to borders; but for this purpose they are unfit, because when fully exposed to the sun, they frequently die in large patches. Mr. Curtis, however, thinks they appear to most advantage as edgings to borders, as they serve to enliven them and to add greatly to the gaiety of the garden. He recommends the roots to be taken up in the last week of September, or the first in October, to be divided into single plants, and to be planted three inches apart in a trench, spreading out the fibres, and pressing the earth closely round them, as they will thus not be subject to be drawn out of the ground by worms. Such edgings should be replanted every autumn; otherwise they will spread too wide. Martyn's Miller's Dict. According to Mr. Curtis, the plants that remain undisturbed in the same spot, will recur to their natural state, and become single; but Mr. Miller says that he never observed them to do so.

Bellis. See Anthemis, Aster, Athanasia, Bellium, Calendula, Chrysanthemum, Cotula, Doronicum, Eclipta, Osmites, and Saponaria.

Bellis *major*. See Chrysanthemum.

Bellis *caerulea*. See Globularia.

Bellis, in *Natural History*, a species of Hydra, resembling the calyx of a flower, warted; tentacula retractile, and variegated. This is *actinia bellis* of Solander and Ellis; and is found on the coast of Cornwall.

Bellis, a species of Vorticella, of a simple hemispherical form, with a contractile margin. Müll. Hist. Verm. Found in stagnant ditch-water; somewhat resembles the flower of a daisy, but small, yellowish; peduncle long, pellucid, very thin, bifid at the end; moves with a rotatory motion.

BELLISLE, in *Geography*. See Belle *Isle*.

BELLIUM, in *Botany*. Lin. gen. Reich. n. 1043. Schreb. 1501. Juss. 182. Class and order, *syngenesia polygamia superflua*. Nat. Ord. *Compositae Discoideae. Corymbiferae*. Juss. Gen. Char. *Cal.* common simple, with very many, equal, boat-shaped leaflets. *Cor.* compound radiated; in the ray female ten or twelve; in the disk hermaphrodite very many:—proper of the hermaphrodite funnel-shaped, quadrifid, erect; of the females elliptic, emarginate, ligulate. *Stam.* in the hermaphrodite filaments four, short; anther cylindric. *Pist.* in the hermaphrodite germ turbinate; style filiform; stigma bifid, oblong; in the females germ turbinate; style very short; stigma bifid, minute. *Per.* none. *Calyx* unchanged. *Seeds* turbinate; crown chaffy, eight-leaved, rounded; down with eight simple awns. *Rec.* naked conic. *Obs.* Different from *Bellis* and *Pectis*, on account of the down and five-cleft corollules.

Ess. Char. *Cal.* with equal leaflets. *Seeds* conic, with a chaffy eight-leaved crown, and awned down. *Recept.* naked.

Species, 1. B. *bellidioides*. Lin. Syst. 770. B. droseræfolia. Gouan. illust. 69. 2. B. annua minima. Triumf. Obs. t. 82. B. maritima min. &c. Bocc. Mus. 149. t. 167. "Scapes naked, filiform." This has the habit of a daisy, but differs essentially from it in having a down to the seed. A native of Italy, about Rome, and in the island of Majorca. 2 B. *minutum*. Linn. Syst. 770. Pectis minuta. Linn. Spec. 1250. Schreb. Act. Upsl. Nov. 1. 84. t. 5. f. 2. Bellis cretica fontana omnium minima. Tournef. cor. 37. Vaill. Act. 547. "Stem leafy." One of the minutest of plants; stem capillary, an inch long; the whole plant smooth and ascending; examined with a glass it appears to have hairs scattered over it. A native of the Levant. Introduced in 1722 by M. Richard.

BELLO, in *Geography*, a town of Italy, in the kingdom of Naples, and province of Basilicata; 2 miles S.S.E. of Muro.

BELLOI, Peter Laurence Buyrette du, in *Biography*, a French dramatic writer, was born at St. Flour, in Auvergne, in 1727, and educated for the bar at Paris. But quitting the profession for which he was designed, he left his country, and went to Russia in the capacity of an actor. After having exercised his literary talents in the composition of various fugitive pieces, he returned to Paris in 1758, and brought on the stage, first his "Titus," and next his "Zelmire." But his tragedy of the "Siege of Calais," exhibited in 1765, was the most popular, and contributed in the greatest degree to establish his reputation. For this performance the king presented him with a gold medal and a considerable pecuniary reward; and the magistrates of the town sent him the freedom of the town in a gold box, and placed his portrait in the hall among their principal benefactors. Voltaire also wrote a complimentary letter

letter to the author, though after Belloi's death he retracted his praiſes. This piece was ſucceeded by his "Bayard," "Peter the Cruel," and "Gabrielle de Vergy." But the failure of the ſecond of theſe haſtened his death in 1755, to the regret of numerous friends, who were attached to him by the goodneſs of his heart. As a dramatic writer his diſtinguiſhing excellence conſiſted in his knowledge of ſtage effect, and of the method of producing it by new and uncommon ſituations; but in purſuing theſe he quitted the true and natural pathetic, and aided in degrading the modern theatre. His verſification is often negligent, and his ſtyle hard and inflated. M. Gaillard of the French academy, publiſhed a collection of his works in 6 vols. 8vo. 1779, with a life of the author prefixed. Nouv. Dict. Hiſt.

BELLON, or Belland, in *Medicine*, a diſtemper very common in Derbyſhire and other counties, where they ſmelt lead ore, to which beaſts, and even poultry, as well as men, are ſubject; and for this reaſon a certain ſpace round the ſmelting-houſes is called bellon-ground, where it is dangerous for any animal to feed. This diſorder is attended with languors, weakneſs, and intolerable pains, ſenſation of gripings in the belly, and generally coſtiveneſs. It frequently proves fatal.

The method of cure which has been found moſt ſucceſſful in this diſtemper, is, to give *cremor*, or cryſtals of tartar, in ſmall doſes, and to repeat them frequently, as two or three times a day.

BELLONA, in *Mythology*, the goddeſs of war, ſiſter or wife to Mars.

Hyginus (fab. 274.) ſays, that Bellona was the inventreſs of the needle, called in Greek βελονη, and hence her name has been fancifully derived. Others with greater probability, deduce it *a bello*, war; and Bryant (Anal. Anç. Mythol. vol. i. p. 45.) ſuppoſes it to be formed from Bel-on, a compound of Bel, Bal, or Baal, the original Babyloniſh title appropriated to the ſun. This goddeſs was of a ſavage diſpoſition, and delighted in ſlaughter and blood; and ſhe was not only repreſented as the attendant of Mars, who prepared his chariot and horſes for war, but as taking pleaſure in ſharing his dangers. She is commonly repreſented in an attitude expreſſive of fury and diſtraction, her hair being compoſed of ſnakes clotted with gore, and her garments ſtained with blood. She is generally exhibited driving the chariot of Mars, with a bloody whip in her hand, and ſometimes as holding a lighted torch or brand, and at other times a trumpet. Bellona had a temple at Rome, near the Porta Carmentalis, in which the ſenate gave audience to ambaſſadors; and before it ſtood the pillar or column of war, againſt which a lance was thrown whenever war was declared. She was alſo worſhipped at two places called Comana, one of which was in Cappadocia, and the other in the kingdom of Pontus; and Camden obſerves, that in the time of Severus, there was a temple of Bellona in the city of York. Poets and artiſts have often confounded Bellona with Pallas.

Bellona, in *Entomology*. Under this name Cramer deſcribes *papilio braſſolis* of Fabricius. The ſpecies *bellona* of Fabricius and Gmelin is a native of North America, has dentated fulvous wings, ſpotted with black; poſterior ones, beneath ſilvery at the tip, with ſix ocellar fulvous ſpots. A variety of it β is figured by Cramer under the trivial name of *hegeſia*.

BELLONARII, in *Antiquity*, prieſts of Bellona, the goddeſs of war and battles.

The Bellonarii cut and mangled their bodies with knives and daggers in a cruel manner, to pacify the deity. In this they are ſingular, that they offered their own blood, not that of other creatures, in ſacrifice. In the fury and enthuſiaſm with which they were ſeized on theſe occaſions, they ran about raging, uttering prophecies, and foretelling blood and ſlaughter, devaſtations of cities, revolutions of ſtate, and the like: whence Martial calls them "turba entheata Bellonæ." Lactant. Inſt. lib. i. cap. i. Lucian. lib. i. Tertul. Apol. cap. 9. Minut. Felix, p. 298. In after-times they ſeem to have abated much of their zeal and tranſport, and to have turned the whole into a kind of farce, contenting themſelves with making ſigns and appearances of cutting and wounds. Lampridius tells us, the emperor Commodus, out of a ſpirit of cruelty, turned the farce again into a tragedy, obliging them actually to cut and mangle their bodies. Lamp. in Commod. cap. 9.

The Bellonarii celebrated feaſts on the eve of the nones of June, and the ninth of the calends of April, on which occaſion they chewed a plant called Bellonaria, which produced a kind of fury, and diſpoſed them to mangle their bodies in the manner which characteriſed theſe feaſts.

BELLONIA, ſo called by Plumier, after the name of M. Bellon, a phyſician of Caen, in *Botany*. Lin. gen. 226. Reich. 242. Schreb. 298. Plum. 31. Juſſ. 200. Claſs and order, *pentandria monogynia*. Nat. Ord. *Rubiaceæ*. Juſſ. Gen. Char. *Cal.* perianth, one-leafed, ſuperior, ſemiquinquefid, permanent; diviſions lanceolate, acute. *Cor.* monopetalous, wheel-ſhaped; tube very ſhort; border flat, ſemiquinquefid, obtuſe, large. *Stam.* filaments five, ſubulate, erect, very ſhort; anthers erect, converging, ſhort. *Piſt.* germ inferior; ſtyle ſubulate, ſtraight, longer than the ſtamens; ſtigma acute. *Per.* capſule turbinate-ovate, wrapped up in the calyx, and beaked with its converging diviſions, one-celled. *Seeds* numerous, roundiſh, ſmall.

Eſſ. Char. *Cor.* wheel-ſhaped. *Capſ.* one-celled, inferior, many-ſeeded, beaked with the calyx.

Species, 1. B. *aſpera*. Lin. Spec. 244. Plum. gen. 19. ic. 47. Swartz. Prodrom. 42. 2. Obſ. 69. "Leaves ovate-ſerrate, flowered corymbed terminating." A ſhrub ten or twelve feet high, from which iſſue many lateral branches. This ſpecies is ſaid to reſt wholly upon the authority of Plumier. Mr. Miller ſays, that it is very common in ſeveral of the warm iſlands of America, whence he has received the ſeeds. 2. B. *ſpinoſa*. Swartz. Prodr. 42. "Thorny; leaves ovate, angular, tooth-ſerrate, peduncles axillary, one-flowered."

Propagation and Culture. It is propagated by ſeeds which ſhould be ſown early in the ſpring, in a pot filled with light freſh earth, and plunged into a hot-bed of tanner's bark, and frequently watered. When the plants are come up half an inch high, they ſhould be tranſplanted into pots filled with light freſh earth, and plunged again into the hot-bed, watered and ſhaded till they have taken root; then air ſhould be admitted to them every day in warm weather, and they ſhould be frequently watered. When the plants have filled theſe pots with their roots, they ſhould be carefully ſhaken out of them, and their roots trimmed, and put into larger pots filled with light freſh earth, and put into the hot-bed again. In warm weather freſh air ſhould be admitted to them every day; but in autumn they muſt be plunged into the bark-ſtove, and treated like other tender exotic plants. Theſe plants will ſometimes flower in the ſecond year, but they rarely produce good ſeeds in this climate. Nevertheleſs, they may be propagated by cuttings in the ſummer months, provided they are planted in light earth on a moderate hot-bed, and carefully watered and ſhaded till they have taken root. They muſt be conſtantly kept in the ſtove, and have a large ſhare of free

air

air in warm weather; but if they are set abroad, they will not thrive in this climate. Martyn's Miller's Dict.

BELLORI, John Peter, in *Biography*, a celebrated antiquary, was a native of Rome, and derived from his uncle Francis Angeloni, under whose care he was placed, his taste for antiquities. He was appointed by Christina, queen of Sweden, the keeper of her library and cabinet of curiosities; and by pope Clement X. antiquary of Rome. He died in 1696, above 80 years of age. His valuable cabinet was afterwards annexed to that of the king of Prussia at Berlin. Of his various works, relating to his favourite pursuits, the principal are the following: viz. "Notæ in Numismata, tum Ephesiæ tum aliarum urbium, apibus insignita," 1658, 4to.; "Fragmenta Vestigii veteris Romæ," 1673, fol.; "La Colonna Trajana," fol.; "Le Pitture Antiche del Sepolcro de' Nasonii," 1680, fol.; "Le Antiche lucerni sepolcrali figurate," 1691, fol.; Gli antichi sepolcri, overo Mausolei Romani & Etruschi," 1699, fol.; "Veteres Arcus Augustorum," 1690, fol.; "Vite de Pittori, Scultori, et Architelli Moderni," 1692, 4to.; "Imagines veterum Philosophorum," 1685, fol. Several treatises of this author are inserted in the 7th volume of Gronovius's Greek Antiquities. He also reprinted, in 1685, with large additions, Angeloni's "Historia Augusta," illustrated by Medals. Moreri. Gen. Biog.

BELLOSTE, Augustin, a surgeon of eminence in his time, inventor of a mercurial composition, called after his time, "Bellostе's pill," by which he is supposed to have acquired a considerable fortune. After practising several years at Paris, where he was born in 1654, and as an army surgeon, he was invited to Sardinia, and made principal surgeon to the queen's mother, and continued to reside at Turin to the time of his death, which happened July 15th, 1730. The work by which he is principally known, is his "Chirurgien de l'Hospital," published 1695. It has passed through numerous editions, and been translated into all the European languages. In 1725, he published a continuation of it, under the title of "La suite du Chirurgien de l'Hospital." Among other useful observations, he recommends piercing carious bones, with the view of accelerating exfoliation, a practice advised by Celsus, though long discontinued. He reproves the custom of frequently removing the dressings of wounds, as tending to retard the cure. The work has much merit, though now little noticed, being superseded by later publications. Haller Bib. Med. Pract. et Chir.

BELLOTTI, Pietro, a painter of history and portrait, was born at Venice in 1625, and learned the art of colouring from Michael Foraboscо, whose disciple he was. As a portrait painter, he attained the first rank, but was less eminent in the composition of his historical subjects. In the imitation of nature he was peculiarly happy; the colouring of his portraits appears to be real flesh, and the variety in the airs of his heads is inconceivable; in all his attitudes there is much grace, and the disposition of his figures is natural and becoming. He died in 1700. Pilkington.

BELLOVACI, in *Ancient Geography*, a people of Gaul, comprised in the nation of the Belgæ, and seated south of the Ambiani. Their country was particularly distinguished by the name of Belgium, and corresponded to the modern Beauvais; their chief city was called by the Latins Cæsaromagus; and Cæsar speaks with commendation of their valour and their number.

BELLOWING, among *Sportsmen*, is used for the noise which roes make in rutting-time.

BELLOWS, a machine used to give a brisk agitation to the air, by enlarging and contracting its capacity, and thus expiring and inspiring the air by turns.

This machine is used in chambers and kitchens, in forges, furnaces, and founderies, for blowing up the fire; and it is annexed to organs and other pneumatic instruments, in order to supply them with a due degree of air. They are constructed of various forms, and furnished with different kinds of apparatus for giving them motion, and for discharging their air, according to the purposes which they are intended to serve. However, they are in general composed of two flat boards, sometimes of an oval and sometimes of a triangular figure; between these boards are placed two or more hoops, bent so as to suit their figure; on the edges of the boards is nailed a piece of leather, broad in the middle and narrow at the ends, which unite them together, and it is also affixed to the hoops of the boards, that the leather may the more easily open and fold again; to the undermost board is fastened a pipe of iron, brass, or copper; and within is a valve, which covers the holes in the under board so as to keep in the air. Strabo informs us (Geog. l. viii. vol. i. p. 464.), from an old historian, that Anacharsis, the Scythian philosopher, who lived in the time of Solon, about 600 years before Christ, invented the bellows, as well as the anchor and potter's wheel; but this account is very doubtful, as Pliny, Seneca, Diogenes Laertius, and Suidas, who likewise speak of the inventions ascribed to that philosopher, mention only the two last, and not the bellows. It appears, however, that they were known in ancient times to the Greeks; and Virgil mentions them in the following passage (Georg. iv. 170.):

"—— Alii taurinis follibus auras
Accipiunt, redduntque."——

Upon which it may be remarked, that bull's leather is unfit for bellows, and ox and cow's leather only can be used for that purpose; but accuracy, in the description of a mechanical engine, is not to be expected in a poet. In more modern times, wooden bellows have been introduced in metallurgic operations, instead of those of leather. The latter require careful management; the repairs of them are expensive; and they seldom last more than six or seven years. When thin leather is employed, it suffers a great deal of air to escape through it; and this evil must be guarded against by continually besmearing it with train oil, or other fat substances; and this is even necessary when thick leather is used, to prevent it from cracking in the folds. Whenever they are repaired, it is necessary again to soften the leather with oil, and this occasions a considerable loss of time. To obviate these, and similar inconveniences, and with a view to some peculiar advantages, wooden bellows have been invented in modern times, of which we shall give some account in the sequel of this article. In the oldest smelting-houses, the bellows were moved by a handle, like those of the smith's forge, or by the pressure of the foot upon a treadle, or by other means, requiring the strength of men. But since the force of water has been employed to move them, the quantity of ore run down has not only been far greater, but the separation of the metal more complete; insomuch, that great part of the iron now prepared at some considerable works, particularly in the county of Gloucester, has been no other than what had been left in the slags of cinders, for want of sufficient force of air.

The action and effect of bellows of every kind, whether leathern or wooden, wrought by water or men, depend on this, that the air which enters them, and which they contain when raised, is again compressed into a narrower space when they are closed. And as the air, like all other fluids, flows to that place where it meets the least resistance, it must of consequence fly out of the pipe or aperture with a velocity propor-

proportional to the force by which it is compreſſed, and muſt therefore blow ſtronger or weaker, as the velocity with which the top and bottom of the bellows meet is greater or leſſer. The blaſt alſo will laſt in proportion to the quantity of air that was drawn into the bellows through the valve or wind-clap.

The action of bellows bears a near affinity to that of the lungs; and what we call blowing in the latter, affords a pertinent illuſtration of what is called reſpiring in the former. Accordingly, bellows have been employed in reſtoring ſuſpended animation; and Dr. Hooke found, by renewing the interrupted action of the lungs by blowing air into them, by cutting away the ribs and diaphragm, and pericardium, &c. and laying the thorax of a dog bare, and having cut off the aſpera arteria below the epiglottis, and bound it on the noſe of a bellows, that as he blowed the dog recovered, and as he ceaſed, became convulſive: and thus the animal remained alternately alive and dead above the ſpace of an hour. See the methods of recovering ſuſpended animation, under the article DROWNING.

The bellows of ſmiths and founders, whether ſingle or double, are wrought by means of a rocker, with a ſtring or chain faſtened to it, and pulled by the workman. The bellows-pipe is fitted into that of the tewel. One of the boards is fixed, ſo as not to play at all. By drawing down the handle of the rocker, the moveable board riſes, and by means of a weight on the top of the upper board, ſinks again.

The bellows of the Chineſe ſmiths is of a very ſimple kind, and is compoſed of a ſquare pipe of wood ABCDE (*Plate* XIII. *Pneumatics*, *fig.* 107.) with a ſquare board G, which exactly fits it, moved by the handle FG. At the farther end is the blaſt pipe HK, and on each ſide of it a valve in the end of the ſquare pipe, opening inwards. The piſton is ſufficiently tight for their purpoſes without any leathering.

The bellows of forges and furnaces of mines uſually receive their motion from the wheels of a water-mill, or in our large furnaces they are worked by a ſteam-engine. Others, as the bellows of enamellers, are wrought by means of one or more ſteps or treadles under the workman's feet.

The bellows of an organ are ſix feet long, and four broad; each having an aperture of four inches, that the valve may play eaſy. There ſhould likewiſe be a valve at the noſe of the bellows, that one may not take the air from the other. To blow an organ of ſixteen feet, there are required four pair of theſe bellows.

The bellows of organs are wrought by a man called the blower; and, in ſmall organs, by the foot of the player. See ORGAN.

The method of conſtructing wooden bellows for the purpoſes of metallurgy, was an important and uſeful invention, for which we are indebted to the Germans. This is expreſsly affirmed by Grignon in his "Memoires ſur l'art de fabriquer le fer," Paris, 1775; and in the time of Becher, they were to be found in Germany, but not in England. Genſſanne, in his "Traité de la fonte des mines parle feu du charbon de terre," Paris, 1770, erroneouſly aſcribes the invention to the Swiſs; being probably led into this error in conſequence of a Swiſs having firſt made known theſe bellows in France. The name of the real inventor, however, has not been aſcertained. From a catalogue of machines given to the magiſtrates of Nuremberg in 1550, by an artiſt, called Hans Lobſinger, Doppelmayer concludes, that he underſtood the art of making ſmall and large bellows without leather, and entirely of wood, which could be uſed in ſmelting-houſes and for organs, and likewiſe copper- bellows, that always emitted a like degree of wind. As Lobſinger made organs, Beckman (Hiſt. Inventions, vol. i. p. 109.) ſuggeſts, that this invention might occur to him; but he has not been able to learn in what it actually conſiſted, or whether it might not die with him. Agricola, who died in 1555, makes no mention of wooden bellows. Samuel Reyher, formerly profeſſor at Kiel, in the improved edition of his diſſertation on air, printed there in 1669, reprinted with additions at Hamburgh in 1725, and entitled "De Pneumatica, ſive de Aere et Aerometria," informs us, that "about 80 years ago a new kind of bellows, which ought to be called the pneumatic cheſts, was invented in the village of Schmalebuche, in the principality of Cobourg, in Franconia," by two brothers, Martin and Nicholas Schelhorn, who were millers in that village. Theſe brothers kept the invention ſecret, but not ſo concealed as to elude conjecture. Reyher relates, how he himſelf formed an idea of it. Schluter, who has given a complete deſcription and figure of theſe bellows in his "Unterricht von Hütten-Werken," Brunſwick, 1738, fol. aſcribes the invention of them to a biſhop of Bamberg; and according to his account they were employed ſo early as the year 1620, in the foreſt of Hartz, to which they were firſt brought by ſome perſons from Bamberg. "What Calvor ſays (according to Beckman, ubi ſupra) reſpecting the introduction of theſe bellows into the foreſt of Hartz, is much more probable; that in 1621 Lewis Pfannenſchmid, from Thuringia, ſettled at Oſtfeld near Goſlar, and begun to make wooden bellows. The bellows-makers of that place conſpired therefore againſt him, and ſwore they would put him to death; but he was protected by the government. He would diſcloſe his art to no one but his ſon, who, as well as his grandſon, a few years ago had the making of all the bellows in the foreſt." From Germany, the art of making theſe bellows was introduced into ſome parts of France, and into Sweden, and became general though various parts of Europe. This kind of bellows conſiſts of two boxes placed upon one another; the uppermoſt of which may be moved up and down upon the lower one, in the ſame manner as the lid of a ſnuff-box, which has a hinge, moves up and down, when it is opened or ſhut: but the ſides of the uppermoſt box are ſo broad as to contain the lower one between them, when it is raiſed to its utmoſt extent. Both boxes are bound together, at the ſmalleſt end, where the pipe is, by a ſtrong iron bolt. It may be readily comprehended, that when both boxes fit each other exactly, and the upper one is raiſed over the under one which is at reſt, the ſpace contained by both will be enlarged; and conſequently more air will ruſh in through the valve in the bottom of the lower one; and when the upper box is again forced down, this air will be expelled through the pipe. The only difficulty is to prevent the air, which forces its way in, from eſcaping any where elſe than through the pipe; for it is not to be expected, that the boxes will fit each other ſo cloſely as entirely to prevent the air from making its way between them. This difficulty, however, is obviated by the following ſimple and ingenious method. On the inner ſides of the uppermoſt box there are placed moveable ſlips of wood, which, by means of metal ſprings, are preſſed to the ſides of the other box, and fill up the ſpace between them. As theſe long ſlips of wood might not be ſufficiently pliable to ſuffer themſelves to be preſſed cloſe enough; and as, though planed perfectly ſtraight at firſt, they would, in time, become warped in various directions, inciſions are made in them acroſs their whole length, at the diſtance of from 15 to 18 inches from each other, ſo as to leave only a ſmall ſpace in their thickneſs, by which means they acquire ſufficient pliability to be every where preſſed cloſe enough to the ſides. This deſcription may be illuſ-

illustrated by a figure, (see *Plate* XIII. *Pneumatics*, *fig.* 108.) in which the outer box ABCPFE has its top and two sides flat or straight, and the end BAE*e* formed into an arched or cylindrical surface, of which the line FP at the other end is the axis. This box is open below, and receives within it the shallow box KHGNML (*fig.* 109.) which exactly fills it. The line FP of the one coincides with FP of the other, and along this line is a set of hinges on which the upper box turns, as it rises and sinks. The lower box is fastened to a frame fixed in the ground. A pipe OQ proceeds from the end of it, and terminates at the furnace, in a small pipe called the "tewer," or "tuyere." This lower box is open above, and has in its bottom two large valves V, V, opening inwards. (See *fig.* 110.) The conducting pipe is sometimes furnished with a valve opening outwards, to prevent burning coals from being sucked into the bellows, when the upper box is drawn up. The joint along PF is made tight by thin leather nailed along it. The sides and ends of the fixed box are made to fit the sides and curved end of the upper box, so that this last can be raised and lowered round the joint FP without sensible friction, and yet without suffering much air to escape; but as this would not be sufficiently air-tight by reason of the shrinking and warping of the wood, a further contrivance is adopted. A slender lath of wood, divided into several joints, and covered on the outer edge with very soft leather, is laid along the upper edges of the sides and ends of the lower box. This lath is so broad, that when its inner edge is even with the inside of the box, its outer edge projects about an inch. It is kept in this position by a number of steel wires, which are driven into the bottom of the box, and stand up, touching the sides, as represented in *fig.* 111, where *a b c* are the wires, and *e* the lath, projecting over the outside of the box. By this contrivance, the laths are pressed close to the sides and curved end of the moveable box, and the spring wires yield to all their inequalities. A bar of wood RS (*fig.* 108.) is fixed to the upper board, by which it is either raised by machinery, to sink again by its own weight, having an additional load on it, or it is forced downward by a crank or wiper of the machinery, and afterwards raised. The operation, in this case, is exactly similar to that of blowing with the chamber bellows. When the board is lifted up, the air enters by the valves V, V, (*fig.* 110.) and is expelled at the pipe OQ, by depressing the boards. These bellows are made of a very great size, AD (*fig.* 108.) being 16 feet, AB 5 feet, and the circular end also 5 feet. The rise, however, is but about 3 or 3½ feet. They expel at each stroke about 90 cubic feet of air, and make about 8 strokes per minute. The advantages of these wooden bellows are very considerable. When they are made of clean fir wood without knots, they will last 30 or 40 years, and even longer, though continually kept in action 45 or 48 weeks every year. Some have said, that, when properly made, they will last a century. The effect produced by them is stronger, as well as more uniform, and can be moderated according to circumstances. They are worked also with greater facility. The slips of wood on their sides are apt to be damaged: but they can soon and easily be repaired. Every three or four months, however, the outer sides only of the inner box, and the bolt which keeps the boxes together, must be smeared with oil. If we calculate the price of such bellows, and the yearly expence, they will, according to Grignon's account (ubi supra) be only a fifth part of those of the old leather bellows. They have, indeed, their defects, though they are less expensive and more durable than those of leather; for it is scarcely possible to make the junctures so tight as to allow no exit to the compressed air, and the friction must necessarily be very great. Some, therefore, have had recourse to water, for performing the office of the lower board of the bellows. A bellows on this principle is described by Mr. Treiwald, engineer to his Swedish majesty, in the Philosophical Transactions, under the name of a "water-bellows." Of bellows of wood we have one preserved in the repository of the Royal Society; and Dr. Plot describes another, that was used at the copper-works at Ellaston in Staffordshire. Nat. Hist. Staff. ch. iv. § 18. Such are the bellows in general use on the continent. In this kingdom, a different, and a preferable form is adopted; for an account of which and other contrivances for animating the large fires of furnaces, &c. see BLOWING MACHINE. See also FURNACE.

BELLOWS, *Apodopnic*, so called by the inventor M. Gorcy, physician to the military hospital at Neufbrisack, and denoting "restorer of respiration," an instrument used for inflating the lungs. It is described in the "Journal de Medicine" for June 1789; and consists of a double pair of bellows BCLM (*Plate* XIII. *Pneumatics*, *fig.* 112.) the two different parts of which have no communication with each other. In the lower side BM is an aperture A for a valve, constructed on the principles of those of Mr. Nairne's air-pump. It consists of a rim of copper, closed at one end by a plate of the same metal, in which plate are seven small holes placed at equal distances. This plate is covered with a piece of silk coated with elastic gum, in which are six transverse incisions of two or three lines in length. Each incision is so made as to be situated between two of the holes, and at an equal distance from each, as represented at D, (*fig.* 113). The silk must be made very secure, by a thread passing several times round the rim. It is obvious, that a stream of air applied to that side of the plate which is opposite the silk, will pass through the holes, and, lifting up the silk, escape through the incisions. On the contrary, a stream of air applied to the other side will press the silk upon the plate, and thus close the holes, so that it will be impossible for it to pass through them. This valve opens internally, so as to admit the air from without. At B is another valve, upon the same construction, but opening in a contrary direction, thus permitting the air to escape out of the lower part into the tube EF, but preventing its entrance. At C is another valve, opening internally to admit the air from the tube EF; and at D there is a fourth, opening externally to discharge the air from the upper part. The flexible tube EF, screwed on at the end CB, being introduced into one of the nostrils, whilst the mouth and the other nostril are closed by an assistant, if we separate the two handles L, M, which were close together at the introduction of the tube, it is evident, that the air in the lungs will rush into the upper part through the valve C, whilst the external air will fill the lower part through the valve A. The two handles being again brought into contact, the atmospheric air will be forced into the lungs through the valve B, and at the same time the air in the upper part will be discharged at the valve D. Thus, by the alternate play of the double bellows, the lungs will be alternately filled and emptied as in respiration. In using the instrument, care should be taken not to be too violent; as the more perfectly the natural motion of respiration is imitated, the better. To prevent any substances from without injuring the valves A, D, (*fig.* 112.) the rim is made with a screw B, (*fig.* 114.) in order to receive a cap A, A, (*fig.* 114.) full of small holes. This screw has also another use. If dephlogisticated air be preferred, a bladder filled with it (*fig.* 115.) may, by means of the screw A, be fastened to the valve A, (*fig.* 112.); and to prevent waste, as this air may serve several times, a flexible tube may be screwed in the valve D, (*fig.* 12.) communicating with the bladder by means of the opening *d*, (*fig.* 115). Thus it may be employed as often

often as the operator thinks proper. There is a handle K to the partition in the middle, in order that, if it be at any time necessary to use either of the divisions alone, the other may be confined from acting. *c, b, (fig.* 116.) represent the two valves to be applied at the end of the instrument CB, *(fig.* 112); and *(fig.* 117.) is a section of the end CB, shewing the valves in their proper places. It is proper to add, that the capacity of the instrument should be proportioned to the quantity of air received into the lungs by inspiration, which Dr. Goodwin has ascertained to be twelve cubical inches, or somewhat more. Each division of the instrument, therefore, should be capable of containing that quantity. (See Analytical Review, vol. iv. p. 437.) Roulland presented, and described at a meeting of the Lyceum of Arts at Paris, in 1797, the model of a pair of bellows, constructed on this plan, intended to restore life to persons drowned and in a swoon, by drawing out the vitiated air seated in their lungs, and replacing it with ordinary air, or even with oxygen, or vital air, if necessary: at the same time producing the motion of the lungs, independently of the concurrence of the patient, to the very instant when his strength shall return. The experiment was submitted to public inspection; a bladder being made up to represent the lungs.

Bellows, *Bone*, φυσήματα οστεινα, occur in Herodotus for those applied by the Scythians to the genitals of mares, in order to distend the uterus, and by this compression, make them yield a greater quantity of milk.

Bellows, *Hessian*, a contrivance for driving air into a mine for the respiration of the miners. This was improved by M. Papin, who changed its cylindrical into a spiral form; and with this, by working it only with his foot, he could produce a wind to raise a weight of two pounds.

Bellows. *Hydrostatic.* See Hydrostatic.

Bellows, or *Trumpet-fish*, in *Ichthyology*, a name given by Ray, Willughby, &c. to the species of Centriscus Scolopax. Gmelin.

Bellows *Rocks*, in *Geography*, rocks that lie in the Atlantic, near the west coast of Ireland, and county of Galway. N. lat. 53° 19′. W. long. 10° 4′.

Bells, *Canterbury*, and *Coventry*, in *Botany*. See Campanula.

Bells, *Hair*. See Hyacinthus.

Bells *Mill*, in *Geography*, a settlement in North Carolina, near the Moravian settlements, at the source of Deep river, the north-westernmost branch of the north-west branch of Cape Fear, and about 50 miles west of Hillsborough.

Bells, in *Heraldry*, are represented as round, when fixed to the legs of a hawk; in which case the hawk is said to be *belled*.

BELLUÆ, in *Zoology*, a name of the sixth order of animals in the Linnæan system, including the genera of the *equus*, or *horse*, the *hippopotamus*, the *tapir*, and *sus*. These have obtuse truncated fore teeth, and hoofed feet.

BELLUCCI, Antonio, in *Biography*, a painter of portrait and history, was born at Venice in 1654, and manifesting an early inclination to painting, became the disciple of Dominico Definico, from whose instructions he acquired a good manner of handling and colouring, an elegant taste of historical composition, and an expertness in painting portraits with grace and resemblance. Having established, by a variety of performances, his reputation for invention, elegance and spirit, he was invited by the emperor Joseph to his court, and appointed his principal painter. But after remaining some years at Vienna, he entered into the service of the prince palatine, in which he long lived, much respected for his personal accomplishments as well as for his excellence in his profession. Pilkington.

BELLUDGE, in *Geography*, a tribe of Arabs, inhabiting that part of Persia which lies on the coast of the entrance into the Persian gulf, between Minau and cape Jaske. They are masters of several vessels, and carry on a considerable trade with Bassora, and even venture as far as the coasts of India. These Arabs are Sunnites; and unity of religious sentiments has occasioned their joining the party of the Afghans in the late revolutions of Persia. Some geographers represent these Belludges as inhabiting all along the Persian coast to the mouth of the Indus, and have described them as a warlike people addicted to piracy. Niebuhr is not able to ascertain whether they are to be considered as independent, or as tributary to Persia. He thinks it probable, however, that they acknowledge no sovereign authority but that of their own scheiks.

BELLUGA, in *Ichthyology*. See Beluga.

BELLULA Bos, a name given by Paulus Jovius to that species of Raja called by the old Greek and Latin writers *bos marinus*; the same kind which Linnæus, and other later naturalists, name specifically Oxyrinchus.

BELLUNESE, in *Geography*, a small mountainous territory of Italy, but rich in iron mines, forms a part of the marquisate of Treviso, and belongs to the republic of Venice. It is bounded on the north by the Cadorin and part of Friuli, on the east by a large forest, which separates it from Friuli, on the south by the Trevisan and Feltrin, and on the west by the bishopric of Trent.

BELLUNO, the capital of the Bellunese, and see of a bishop, suffragan of the archbishop of Udina, seated on the Piava, between the town Cadore and Treviso; 43 miles N. of Venice, and 48 E. of Trent. N. lat. 46° 10′. E. long. 12° 15′.

BELLY, in a general sense, denotes the whole abdomen, or that region of the body contained between the *septum transversum*, the *hypochondria*, and *pubes*.

Belly is also used, in a more confined sense, for the intestines alone, as containing the *fæces*. In this sense we speak of the looseness or costiveness of the belly, &c.

Belly is also sometimes used for a pregnant woman. In this sense we are to understand the phrase among *Civil Lawyers*, to put the belly in possession of an estate.

Belly is also used in speaking of the bodies of animals; is synonymous with abdomen, and may be separately considered. It is variously characterised, according to their food and habits. In those which feed on vegetables, it is in general capacious, and hanging low; in the carnivorous, light, and drawn up at the flanks. In a horse, a barrel-shaped or cylindrical belly is most admired; if hanging low, he is said to be cow-bellied; if two much contracted, he is said to be tucked up at the flanks. Grass, too much water, broken wind, and in mares the gravid uterus, occasion the belly to relax and become pendulous; dry food, as oats, beans, and hay, &c. and also acute pain, contract the volume of the belly. The slow moving ruminant animals, as oxen, &c. have the belly the most capacious and pendulous of all quadrupeds. This increased volume of the intestines and stomach appears to be designed for the purpose of enlarging the surface for digestion and chylification, and extracting more completely all the nutritious particles, so that a lesser quantity of food will suffice: this circumstance is particularly remarkable in the sheep, which can fatten on the shortest grass, and almost barren glebe.

In the abdomen of the horse, and other graminivorous quadrupeds, whilst its vast surface exposes it more to be acted upon by changes of weather, as cold, rain, wind, &c. than in the carnivorous animals, so it has appeared to us to be also provided with a thinner and less fatty membrane, or mesentery, to cover the intestines from their influence. Hence appears

appears to be a cause for the frequent indigestions in these animals, often speedily terminating in death, to which their capacity also greatly contributes by receiving too large a quantity of food at once. See the article GRIPES *of Horses*.

The abdomen of the horse and ox, and other quadrupeds of this description, from its vast size, hangs below the patella or knee, which occasions the thigh of the horse to be mostly overlooked or taken for some other part; the patella or stifle being the real termination of the thigh in these animals.

In the horse, the volume of the abdomen is formed by the vast magnitude and length of the intestines, and a single stomach not very large; in the cow, on the contrary, the swelling bulk of the abdomen is occasioned by four large stomachs, and the intestinal canal is proportionably small and short. The sheep with four stomachs possesses also a vast length of intestine.

BELLY *of a Muscle*, in *Anatomy*, denotes the body thereof, as contradistinguished from the two extremities, or tendons. From the conditions of this, muscles are divided into monogastric, or single-bellied; and digastric, or double-bellied. Phil. Trans. N° 258.

Lower will have all the muscles to be digastric, or double-bellied; in which he is seconded by Hoffman and others.

BELLY-*ach-weed*, a name given in America to a species of the JATROPHA.

BELLY, *Dragon's*, *venter draconis*, is used by some *Astronomers* to denote the point in a planet's orbit, wherein it has its greatest latitude, or is farthest distant from the ecliptic; more frequently called its limit.

BELMONT, in *Geography*, a town of France, in the department of the Loire, and chief place of a canton, in the district of Roanne, 14 miles north-east of Roanne. The place contains 1716, and the canton 7244 inhabitants; the territory includes 115 kiliometres and 8 communes.—Also, a town of France, in the department of the Aveyron, and chief place of a canton, in the district of St. Afrique, nine leagues east of Alby. The place contains 1561, and the canton 5502 inhabitants; the territory includes 220 kiliometres and nine communes.

BELMONTE, a town of Italy, in the kingdom of Naples, and province of Calabria Citra, having a castle on an eminence near the sea, 11 miles W.S.W. of Cosenza. N. lat. 39° 20′. E. long. 16° 50′.—Also, a small town of Portugal, in the province of Beira, and jurisdiction of Correiçao de Castello Branco, containing about 1140 inhabitants, two churches, and a district of two parishes.

BELO, or BELON, in *Ancient Geography*. See BELON.

BELOAR, a name given by some to a stone, otherwise called WIDURIS.

BELOMANCY, BELOMANTIA, a kind of divination by means of arrows, practised in the East, but chiefly among the Arabians, among whom it continued till Mahometanism prevailed, which absolutely forbids it. The word is of Greek origin; compounded of βελος, *arrow*, and μαντεια, *divination*. Belomancy has been performed in different ways; one was, to mark a parcel of arrows, and put eleven, or more of them, into a bag; these were afterwards drawn out; and according as they were marked, or not, they judged of future events. These arrows resembled those with which they cast lots, being without heads or feathers, and were kept in the temple of some idol, in whose presence they were consulted. Seven such arrows were kept in the temple of Mecca. Another way was to have three arrows, on one of which was written, "My lord hath commanded me;" on another, "My lord hath forbidden me;" and upon the third, nothing at all. These were put into a quiver, out of which they drew one of the three at random; if it happened to be that with the first inscription, the thing they consulted about was to be done; if it chanced to be that with the second inscription, it was let alone; and if it proved to be that without inscription, they drew over again. These divining arrows were generally consulted before any thing of moment was undertaken; as when a man was about to marry, or to go a journey, or the like.

Belomancy is an ancient practice, and probably that which Ezekiel mentions, chap. xxi. ver. 21. At least St. Jerom understands it so, and observes, that the practice was frequent among the Assyrians and Babylonians. Something like it is also mentioned in Hosea, chap. iv. only that staves are there mentioned instead of arrows, which is rather rhabdomancy than belomancy. Grotius, as well as Jerom, confounds the two together, and shews that they prevailed much among the Magi, Chaldeans, and Scythians, whence they passed to the Sclavonians, and thence to the Germans, who, as Tacitus observes, made use of belomancy.

BELON, PETER, in *Biography*, born in the province of Maine about the year 1518, was an industrious and ingenious naturalist, esteemed for his learning and talents by Henry II. and Charles IX. of France, and patronised by the cardinal de Tournon, at whose expence he travelled over Italy and Greece, a great part of Germany, France, England, Palestine, and Egypt, collecting and examining every where the plants, animals, and minerals proper to the places through which he journeyed. On his return, he published, in succession, the results of his observations and inquiries. The principal of his works are, "Les Observations de plusieurs singularités, et choses memorables trouvées en Grece, en Asie, Judée, Egypte, Arabie, &c." Paris, 1553, 4to.: an excellent work, Haller says, and the first of the kind that had been published from actual observation; no one before him having travelled so extensively for the purpose of improving natural history. It has been frequently reprinted, and a Latin version of it given by Clusius, in 1589. "De arboribus coniferis, resiniferis, aliisque nonnullis sempiternâ fronde virentibus, &c." Paris, 1558. The descriptions are in general just; the engravings indifferent. He had seen the true cedar of Lebanon. He also gave a treatise "On the Method of embalming practised by the ancients;" "On the Defects in Agriculture;" "On the Management of Gardens," and recommends the introduction of many foreign trees into them, pointing out those most congenial to the climate of France; "On Birds;" and "On Fishes;" with their figures. More he had done; but he was stabbed by a robber in 1563, being only about 45 years of age. Haller. Bib. Botan.

BELONE, in *Ichthyology*, a species of Esox, having both jaws long and subulate. Linn. This is *acus piscis* of Salvianus; *acus vulgaris*, Ray; and *sea-pike*, or *gar-fish*, of the English. It is sometimes called also the *sea-needle*.

The sea-pike inhabits all great seas, and was known both to the Greeks and Romans. It keeps in deep water part of the year, and visits our coasts in immense shoals in the beginning of the summer, just before the mackerel make their appearance. The length of this fish is usually from a foot and a half to three feet; but if the relation of Renard may be depended upon, they are found of the length of eight feet in the eastern parts of the world. A fish of this species has been taken in the Mediterranean, on the coast of Lisbon, weighing fourteen pounds. In some countries the fishery for the sea-pike is very considerable; in England they are not much esteemed, although the flesh is scarcely inferior to that of the mackerel. The bone of the back, when the fish is boiled, is of a bright green colour, from which

which many people conclude, though very unjustly, that it cannot be a wholesome food.

All the upper part of the back and head of this fish is of a beautiful green colour; sides and belly silvery. The number of rays in the dorsal fin are about sixteen; pectoral thirteen; ventral eight; anal twenty-two; and in the tail twenty-two; but these are liable to vary in number, as in other fishes.

BELOW, or BELAN, in *Geography*, a river of England, which runs into the Eden, 2 miles north of Kirby-Stephen, in the county of Westmoreland.

BELOZERO. See BIELO-OZERO.

BELPBERG, a mountain of Switzerland, about 7 or 8 miles from Bern, being part of the chain of the Alps; the strata of which are full of different species of chamites, ostracites, globosites, splenites, strombites, and other similar petrifactions.

BELPECH, a town of France, in the department of the Aude, and chief place of a canton, in the district of Castelnaudary, $3\frac{3}{4}$ miles south-west of Castelnaudary. The place contains 2081, and the canton 5318 inhabitants; the territory includes 140 kiliometres and 12 communes. N. lat. 43° 12′. E. long. 1° 39′.

BELPRE, a post town and small settlement of America, in the territory north-west of the Ohio, on the north-west bank of Ohio river, between the Hockhocking and Muskingum rivers, and opposite the mouth of the little Kanhaway; about 14 miles below Marietta, and 480 miles S.W. by W. from Philadelphia.

BELSHAZZAR, in *Scripture History*. See BABYLONIA.

BELSINUM, in *Ancient Geography*, a town of Hispania Tarragonensis, in the country of the Celtiberians. Ptolemy.

BELSUNCE, HENRY-FRANCIS-XAVIER DE, in *Biography*, denominated, by way of honourable distinction, "the good bishop of Marseilles," was the son of the marquis of Belsunce, a nobleman of Guienne. After quitting the society of the Jesuits, into which he first entered, he was in 1709 nominated to the bishopric of Marseilles; where he distinguished himself by his fortitude and charity, during the dreadful plague which afflicted that city in 1720 and 1721. Such was the effect produced by his attention and liberality on occasion of this calamity, such the attachment cemented between him and his diocesans, by their gratitude and his own sympathy, that he declined accepting the bishopric of Laon, to which are annexed a peerage and a dukedom, which was offered to him by the king in 1723. He died in 1755. Nouv. Dict. Hist.

BELT, BALTHEUS, and among the ancient and middle age writers, *zona, cingulum, reminiculum, rinca*, or *ringa*, and *baldrellus*, in *Armour*, a kind of military girdle, in which a sword or some other weapon is commonly hung.

That the belt, or girdle, formed a material part of the Hebrew armour, may be gathered from the expressions so frequently repeated in the sacred scriptures. *The Almighty girding himself*, imported not only his giving notable displays of power, but his readiness to act; and his girding others expressed the ability he had bestowed upon them to perform magnificent exploits.

The belts of the Hebrew soldiers, with which they girded on their arms, went not about their shoulders but their loins, and were supposed to strengthen them. (See Neh. iv. 18. Ezek. xxiii. 15.) They were generally valuable, especially those of commanders, and were sometimes given as rewards to soldiers. Jonathan presented his to David (1 Sam. xviii. 4.); and Joab tells the person, who had seen Absalom hanging from the tree, that if he had smitten him to the ground, he would have given him ten shekels of silver and a *girdle*.

The Greeks called it ζωνη, or ζωμα, and they thought it so essential to a warrior, that ζωνυσθαι became a general term for clothing themselves in armour. Whence Agamemon is described by Homer

"Ατρειδης δε βοησεν, ιδε ζωνυσθαι ανωγεν;"

and which no doubt occasioned Pausanias to suppose that ζωνη had a reference to the whole armour. So Herodotus, relating the flight of Xerxes to Athens, describes him, when arrived at Abdera, and believing himself free from danger, λυειν την ζωνην, *to have disarmed himself*. (Urania. cxx.)

Among the Greeks, the belt was worn very differently from the manner already described, and reached even to the thigh, whence Homer's hero, (Odyss. λ.)

——"φασγανον οξυ εξειρυσαμενος παρα μηρου,"

and Virgil's Æneas (l. x. l. 86.)

——"ocyus ensem
Eripit a femore."

Foot soldiers, we are told, wore their swords on the left; horsemen, on the right side. Josephus, describing the downfal of Jerusalem (l. iii.), expressly mentions horsemen with their swords on the right. But whether this was constantly the case, or frequently varied, as Lipsius has observed of the Roman sword, cannot easily be determined.

Herodotus, mentioning the military habits of the Persians, says, they had daggers suspended to the right thigh by a belt.

Beger has given a bust of Scipio, copied by Montfaucon (vol. iv. pl. vi. f. 4.), which has an embroidered belt hanging from the right; while a soldier on the arch of Constantine is represented in scale armour, with a belt suspended from the left shoulder. Montfaucon, vol. iv. pl. xx. f. 2.

In our own country, like those of ancient times, it was frequently ornamented in the richest style; and it is worthy of observation, that in some of the most magnificent illuminations of our ancient manuscripts, even in the same picture, the sword is represented as indiscriminately belted on the right side or the left. In later ages, the belt was given to a person when he was raised to knighthood; whence it has also been used as a badge of the knightly order.

BELT is also a denomination applied to a sort of bandages in use among surgeons, &c. Thus we meet with quicksilver belts, used for the itch. A later writer describes a belt for keeping the belly tight, and discharging the water in the operation of tapping. Medic. Ess. Edinb. tom. i. p. 218.

BELT, or BELTIS, in *Ecclesiastical Writers of the Middle Age*, denotes a sort of string of beads.

BELT is also a frequent disease in sheep, cured by cutting their tails off, and laying the sore bare; then casting mould on it, and applying tar and goose-grease.

BEL-TEIN, in *Mythology*, a superstitious custom, formerly observed in Scotland and Ireland; and according to Dr. Ledwich, on the authority of Wormius, in Scandinavia. Dr. O'Brien, in his Irish Dictionary, explains it *ignis Beli Dei Asiatici*; and mentions, that on the first of May the Druids were used to light large fires on the summits of hills, into which they drove four-footed beasts, using at the same time certain ceremonies, to expiate the sins of the people. This pagan ceremony of lighting these fires in honour of Belus, or the sun, gave its name to the month of May, which is called *Beal-tine*, and May-day *la Bealtine*. On this day all the inhabitants of Ireland quenched their fires, and kindled them again out of some part of the sacred fire. That celebrated Irish antiquarian, general Vallancey, infers from the name of this custom, that it was derived from the Persian-Scythians, or Phœnicians, by whom the sun was worshipped under the same name of Belus, or Bel, and on the tops of hills also, as appears from the *high places* mentioned in scripture.

ſcripture. In Gaul alſo there are traces of the ſame ſuppoſed deity being worſhipped under the name Belinus. The Iriſh ſtill preſerve the cuſtom; and to this day in many places fires are lighted on the firſt of May in the milking yards, which the men, women, and children paſs through or leap over, and the cattle are driven through the flames of the burning ſtraw. In the weſtern iſles of Scotland, Mr. Martin found a like ceremony called by the ſame name; and Mr. Pennant thus particularly deſcribes it. "It is a kind of rural ſacrifice, performed by the herdſmen of every village on the firſt of May. They cut a ſquare trench on the ground, leaving a turf in the middle; on that they make a fire of wood, on which they dreſs a large caudle of eggs, butter, oatmeal, and milk; and bring, beſides the ingredients of the caudle, plenty of beer and whiſkey; for each of the company muſt contribute ſomething. The rites begin with ſpilling ſome of the caudle on the ground by way of libation: on that every one takes a cake of oatmeal, upon which are raiſed nine ſquare knobs, each dedicated to ſome particular being, the ſuppoſed preſerver of their flocks and herds, or to ſome particular animal the real deſtroyer of them. Each perſon then turns his face to the fire, breaks off a knob, and flinging it over his ſhoulder, ſays, *This I give to thee, preſerve thou my horſes; this to thee, preſerve thou my ſheep;* and ſo on. After that, they uſe the ſame ceremony to the noxious animals. *This I give to thee, O fox! ſpare thou my lambs; this to thee, O hooded crow! this to thee, O eagle!* When the ceremony is over, they dine on the caudle; and after the feaſt is finiſhed, what is left is hid by two perſons deputed for the purpoſe; but on the next Sunday they reaſſemble, and finiſh the reliques of the firſt entertainment." That fire was adored in Ireland, is ſufficiently proved from this celebrated feſtival, independently of other circumſtances; but whether it can be urged in proof of the colonization of Ireland by the ſouthern Scythians or Perſians is not equally clear. Dr. Ledwich ſays, that fire was adored by the Celtes and Northern Scythians, and mentions from Wormius the manner of kindling it. On the other hand, the name bears a ſtriking reſemblance to that of the Aſiatic deity; and the early naval expeditions of the Phœnicians render its having been communicated by them leſs improbable. The writer of this article has not, however, yet met with any account of a ſimilar practice amongſt the nations in the ſouth of Aſia, or with any attempt to explain the name from thoſe languages which are undoubtedly of Celtic origin. The circumſtance, indeed, of all languages having had one common ſource, leſſens the force of thoſe arguments which are derived from a reſemblance in words denoting the ſame thing; and yet great ſtreſs is laid on ſuch reſemblance in the arguments for the Perſian colonization of Ireland. Collectanea de rebus Hibernicis paſſim. Pennant's Tour in Scotland, vol. iii. O'Brien's Iriſh Dictionary. Ledwich's Antiquities of Ireland. See BELINUS.

BELTS. *Faſciæ*, in *Aſtronomy*, two zones or girdles ſurrounding Jupiter's body, more lucid than the reſt, and terminated by parallel lines; being ſometimes broader, and ſometime narrower, nor conſtantly taking up the ſame places in his diſk. Dark ſpots have been frequently obſerved on Jupiter's belts. Caſſini has alſo diſcovered a permanent one in the moſt northern part of the moſt ſouthern belt: by this he has determined the length of Jupiter's day, that is, the time of his revolution on his axis, which is finiſhed in nine hours and fifty-ſix minutes. Phil. Tranſ. N° 10. and vol. lxiii. part. i. N° 11. p. 73. Some aſtronomers take the belts to be ſeas, which alternately cover and leave bare large countries of the planet; and that the ſpots are gulfs in thoſe ſeas, perhaps as big as our ocean, and ſometimes full, ſometimes dry. M. Azout rather imagined the ſpots to be protuberances of the belts. Hiſt. Acad. Sc. 1708. 1692. Phil. Tranſ. No. 34. 1. 15. But other aſtronomers take the ſpots, which are tranſparent and moveable, for the ſhadows of Jupiter's ſatellites. The belts of Jupiter were firſt obſerved, and deſcribed by Huygens in his Syſt. Saturnin. p. 7. See JUPITER.

Caſſini alſo ſpeaks of belts of Saturn; being three dark, ſtraight, parallel bands, or *faſciæ*, on the diſk of that planet. Saturn's belts do not appear to be inherent on his globe, as thoſe of Jupiter's are; but rather to be large dark rings at a diſtance from the planet, and ſurrounding his body. Some imagine them to be clouds in his atmoſphere. The middlemoſt ſeems to be the ſhadow of Saturn's ring. Hiſt. Acad. Sc. 1715. See SATURN.

BELTS, in *Geography* and *Navigation*, denote certain ſtraits near the Sound, through which ſhips paſs from the Baltic to the German ocean. They belong to the king of Denmark, who exacts a toll, varying in its amount, and in ſome circumſtances attending the collection of it, from all ſhips that paſs through them as well as the Sound. (See SOUND.) They are divided into the *greater* and the *leſſer*. The *greater belt* forms a communication between the Scaggerack or Cattegat ſea and the Baltic, ſeparating the iſlands of Zealand and Funen. The *leſſer* or *little belt* forms a communication between the Cattegat and Baltic, and ſeparates the iſle of Funen from the continent. The paſſage from Aſſens to Arroe Sound, in the duchy of Sleſwick, acroſs the little belt, is 9 miles.

BELTURBET, a market and poſt town of Ireland, in the county of Cavan, ſituate on the river Erne, 81 Iriſh miles north-weſt of Dublin. It has a navigation through Lough Erne to Bellech, within three miles of Ballyſhannon, where it is interrupted by conſiderable falls. The navigation from Lough Erne is open to the town, with water enough in winter, and by reducing a few flats might be made completely ſo in all ſeaſons. No place indeed can be better ſituated for trade or for improvement; the beautiful expanſion of water and picturesque views are highly engaging, and the land is a ſound limeſtone. Yet the market is indifferently ſupplied, which may in great meaſure be attributed to the cuſtoms being taken in kind, without any lawful ſtandard or meaſure, ſo that it is more advantageous for the buyers and ſellers to go to other markets. Theſe cuſtoms are individual property, and ſet for 100l. per annum.

The town was regularly divided into compartments, termed homeſteads; each of which contains 36 ſquare yards, to which is annexed a proportionate quantity of bog. Every houſholder has alſo a right to graze on an extenſive common belonging to the town, which was given by the Laneſborough family, to which it formerly belonged, and which ſeems to have ſpared no expence for its improvement. Another grant of two hundred acres has become the property of the burgeſſes, who divided it, and have tranſmitted it down in their reſpective families. There are ſome neat houſes, eſpecially thoſe lately erected on the part now belonging to lord Farnham; but in general they are mean and thatched. There are an excellent flour-mill, a brewery, diſtillery, and malt-houſes in the town; and ſome yarn is brought to market, but no webs. Cultivation is improved in the neighbourhood; but is yet very defective. The manures uſed are aſhes, marl, and dung; though there is good limeſtone, and much of the ſoil conſiſts of deep clays which could be ſo well reclaimed with lime, yet this is never uſed, but ſent by the lake to the county of Fermanagh. In the church-yard is the veſtige of a great fortification, incloſing an extenſive plot of ground, the baſtions and ſalient angles of which are yet perfect; they were admirably planned and

of great ſtrength. Belturbet was a borough town, and, previous to the union, ſent two members to parliament.

BELTZ, or Belz, a palatinate of that part of Poland which was formerly called Little or Red Ruſſia, and which included three diſtricts, viz. Buſk, Horodla, and Hrabowiec. Its capital, bearing the ſame name, is a large town, ſeated among marſhes in the confines of Volhynia. N. lat. 50° 15′. E. long. 23° 50′.

Beltz, a town of Croatia, 12 miles S. S. W. of Varaſdin.

BELVEDERE, or Belvidere, a town of European Turkey, and capital of a province of the ſame name, in the Morea, which province lies on the weſtern coaſt, and is the richeſt and moſt fertile in the Morea. From this province the raiſins called "Belvederes," derive their name. The town lies 20 miles ſouth of Chiarenza. N. lat. 38° 5′. E. long. 22° 0′.

Belvedere, in *Architecture*. See Belvidere.

BELVEZ, in *Geography*, a town of France, and chief place of a canton, in the department of the Dordogne, and the diſtrict of Sarlat, 9½ leagues S.S.E. of Perigueux. The place contains 2099, and the canton 7987 inhabitants, the territory includes 147½ kiliometres, and 15 communes. N. lat. 44° 46′. E. long. 0° 54′.

BELUGA, in *Zoology*, the name of Delphinus Leucas in Pennant's Quadrupeds.

Beluga *ſtone*, in *Natural Hiſtory*, the name of a calculus or ſtone found in the beluga fiſh. This ſtone is found in fiſh of both ſexes, but moſt frequently in the male; and in thoſe of all ages and ſizes. It occurs, however, but ſeldom; whence it is inferred, that theſe ſtones are no natural part of the fiſh, but mere morbid concretions, like the bezoar ſtones in the animals which produce them, or like the ſtone in human bladders. It is of various ſhapes and ſizes; but its moſt uſual figure is either globular or oval. It is of a yellowiſh-white colour, and of a ſmooth and naturally poliſhed ſurface, and in ſize it is between a pigeon's egg and that of a goose. It is uſually compact, ponderous, and ſolid, not friable, but requiring a ſtrong blow to break it; however, it yields eaſily to the ſaw, which defaces its internal ſtructure, that is naturally very elegant and regular. It conſiſts of ſeveral concentric coats, adhering firmly to one another, and formed about a nucleus, which generally appears to be ſome heterogeneous ſubſtance. It differs from all other ſtones of the ſame kind in its radiated ſtructure, as it is compoſed of a number of regular and even ſtriæ proceeding from the centre to the circumference, and repreſenting, both in colour and form, the flakes of the "terra foliata tartari," or the ſtriated ſpiculæ of antimony. If the ſtone be ſcraped to powder and ſprinkled upon a hot iron, it gives a faint urinous ſmell, and calcines into a light, inſipid, greyiſh earth. The people about the Volga hold it in high eſtimation, and aſcribe to it great virtues. They ſay, it promotes delivery; and they give it in caſes of the ſtone, and diſorders of the urinary parts, in doſes of from 10 grains to a dram. Phil. Tranſ. vol. xliv. p. 2. n. 4.

BELVIDERE, or Belvedere, in *Architecture*. This word meaning *beautiful view* is uſed in Italy, to denote thoſe edifices built for the purpoſe of enjoying a fine proſpect; theſe are of two kinds, either detached buildings, or little cupolas (or, to uſe the expreſſive Engliſh term, *look-outs*,) raiſed on the tops of houſes which terminate them ornamentally, and where one may enjoy the freſhneſs of the evening and the beauties of nature.

Almoſt all the houſes in Rome have belvederes of the laſt kind, the others generally belong to the palaces and pleaſure grounds of the great. The moſt celebrated and remarkable of all is the Belvedere of the Vatican. This large edifice was originally built by Bramante, detached from the pontifical palace, to which it has ſince been united by two long galleries. It commands the view of the rich champaign, which ſurrounds the town on this ſide; the chain of the Apennines forms the magnificent diſtance of the picture, while the foreground is occupied by the city itſelf, which is ſeen in its whole extent. It is from thence that one may ſay with Martial:

"Hinc ſeptem dominos videre montes,
Et totum licet eſtimare Romam."

Belvederes are common in France; they are generally ſingle ſaloons open to the air, or encloſed with doors and windows. They are, however, ſometimes compoſed of various apartments, veſtibules, ſaloons, cabinets, &c. ſuch is the Belvedere in the menagerie of Seaux. When, however, theſe buildings are at a conſiderable diſtance from the manſion, and contain ſeveral apartments for the purpoſe of entertainment, they are called *Trianons*.

In England, though the name of Belvedere is not uſed, it may be properly applied to many of our garden-buildings. The old manſions were very commonly gloomy both in ſituation and in conſtruction, but they generally poſſeſſed a *ſummer-houſe*, which was built in an elevated and agreeable part of the garden, where in the moſt genial months of the year the family might enjoy the air, the proſpect, and the ſocial pleaſures, without the ceremony of the drawing-room. In our modern villas the beauties of ſituation are conſulted, and every idea of gloom is baniſhed by the long windows, the ſaſh-doors, and the wide extended lawn; the ſubſtantial ſummer-houſe is, therefore, unneceſſary; but of the temples, cottages, objects which adorn the modern grounds, while ſome are merely the ornaments of the landſcape, others very exactly anſwer the deſcription of the Belvedere.

Belvidere, or *Belvedere*, in *Botany*. See Scoparia.

Belvidere, in *Geography*, a new townſhip of America, in Franklin county, and ſtate of Vermont.—Alſo, a village in New Jerſey, in the Suſſex county, on the Delaware river, and at the mouth of Pequeſt river, 11 miles above Eaſton, in Pennſylvania.

BELVIS, a ſmall town of Spain, in Eſtremadura, with a caſtle, ſeated between two mountains.

BELULCUM, a ſurgical inſtrument of various figures, contrived for extracting darts, arrows, or the like from wounds. Hence alſo the denomination *belulcum; quaſi* το βελος ελκειν.

BELUNUM, in *Ancient Geography*, a town of Italy, in Rhætia, and the country of the Veneti, now *Beluno*.

BELUR, in *Geography*, the general name given to the Alpine region, which divides the ſouthern parts of the ancient Scythia, or Great Bucharia, from Little Bucharia, lying in about N. lat. 37°, and E. long. 71°, between Kotlan to the north, and Kilan to the ſouth, and Badakſhan in Great Bucharia on the weſt, and Balſiſtan, or Little Thibet on the ſouth-eaſt. Strahlenberg has introduced a town of the ſame name into his map, but its exiſtence is dubious. Rennell places it at the foot of the mountain, in N. lat. 37°, and E. long. 71°. He has alſo marked a lake near it, from whence flows the Amu, which, after its junction with ſeveral others, proceeds to Badakſhan.

Belur *Tag*, denoting, in the Mungl language, "the dark or cloudy mountains," part of that ridge of mountains which, in a nearly meridional courſe, terminates Great Bucharia on the eaſt, and divides it from Little Bucharia. Theſe mountains are covered with perpetual ſnow. They form a chain, ſuppoſed to be the ancient Imaus, which proceeds nearly north and ſouth, and is continued by the mountains of Alakor Alak Oola, on the north of Little Bucharia, which join the Bogdo, and on the ſouth is more intimately connected with the Hindooh Koh than with the northern ridges of Thibet. Thoſe who live at the foot of theſe mountains gather a great quantity of gold and ſilver duſt in the ſpring,

ſpring, which is brought down by torrents when the ſnow melts.

Belus, in *Entomology*, a ſpecies of Papilio, that inhabits Surinam. The wings are greeniſh; inner margin of the poſterior pair rather pale; beneath brown, with red lunar marks. Fabricius and Jablonſky.

Belus, in *Ancient Geography*, a town of Spain, ſituate near the columns of Hercules. Steph. Byz. This was probably the ſame with Belo or Belon.

Belus, now *Kardanah*, a river of Phœnicia, which flowed at the diſtance of two ſtadia ſouth from Ptolemais. It had its ſource in mount Carmel, about 4 miles to the eaſt of the Kiſhon, in the lake called by Pliny Cendevia. The ſand of this river and its vicinity was peculiarly excellent, according to Strabo, for the manufacture of glaſs; and here, according to Pliny, the manufacture of glaſs was firſt diſcovered.

Belus, in *Ancient Hiſtory* and *Mythology*, is ſuppoſed by ſome to have been the Pul of ſcripture; and the founder of the Aſſyrian monarchy; and they add, that he left his kingdom to his ſon Ninus, or Tiglath-Pileſer, who cauſed him to be worſhipped after his death, and erected to his honour the famous tower of Babel, or Belus, in the city of Babylon. Others conceive Belus to have been the Nimrod of Scripture, and more ancient than the Aſſyrian kingdom. (See Assyria and Babylon). The tower of Belus was afterwards uſed by the Chaldeans as an aſtronomical obſervatory; and it is ſaid, that Belus himſelf promoted the ſtudy of aſtronomy, in order to encourage that faith in aſtrological predictions, which he knew how to apply to political purpoſes. Hence, as Belus was honoured with a place among the divinities, ſome have traced the origin of thoſe fables that are found concerning him in the Grecian mythology, to this circumſtance.

Belus, conſidered as the founder of the Aſſyrian and Babylonian empires, became the principal object of veneration and worſhip among the later Babylonians, Phœnicians, and others, over whom the deſcendants of his family extended the dominion he had founded. Accordingly, a temple was erected to him in the city of Babylon, and alſo a tower; though it is not improbable, that the honour of this temple and tower was meant to be divided between him and the true God. This building (ſee Babylon) conſiſted of eight towers raiſed above one another; and in the apartments was placed a magnificent bed, with a golden table near it, but without any image; nor was any perſon ſuffered to lie here in the night, except a particular woman, who, as the prieſts reported, was preferred by the god to all others. In this place, according to their account, he uſed to come and repoſe himſelf; ſo that they muſt have regarded him as the ſupreme god, who either could not be repreſented, or not bear the preſumption in them of attempting his reſemblance. Beneath this there was another temple, in which was a gigantic image of Jupiter or Belus, made of ſolid gold, with a table and a throne of the ſame metal. This Jupiter, ſuppoſed to be the great Pul, or Belus, by being placed below the great and ſupreme god ſeems to have implied, that Belus, or Pul, divided the empire of the univerſe with him, and that as the former was the god of heaven, the other was at leaſt delegated god on earth, and invested with all power by the immediate appointment of the inviſible ruler of all things. Some have ſuppoſed, that the Babylonians, by their ſuperior deity, meant the ſun, which was undoubtedly a very ancient and a very general object of worſhip; and the appellation Belus itſelf might be ſynonymous with that of Baal, which denoted god or lord. (See Baal.) In the Babylonian temple there were alſo two altars, one of gold, of a moderate ſize; and another much larger: on the former were ſacrificed none but ſucking victims, and on the other none but thoſe that were full grown. The former ſeemed to have been devoted to the ſupreme god; and the other to his ſubordinate, Jupiter. They had alſo ſacrifices that were offered to both. Upon the whole, it ſeems not improbable, that by Bel, Baal, or Belus, the Babylonians underſtood either the ſun or their deified founder Pul; but whether they tranſformed him into the ſun, or kept the worſhip of this luminary, and that of their hero diſtinct, ſo as never to confound them together, is a queſtion not eaſily decided. For a deſcription of the temple of Belus, ſee Herodotus, lib. i. ſee alſo Babylon.

BELUTTA, in *Botany*. See Celosia and Crinum.

BELY Bogue, in *Mythology*. See *Bely* Bogue.

BELZ, in *Geography*, a town of France, in the department of Morbihan, and chief place of a canton, in the diſtrict of L'Orient. The place contains 1321 and the canton 9820 inhabitants; the territory includes 147½ kilometres and 5 communes.

BELZICA, a town of Poland, in the palatinate of Lublin, 14 miles S. W. of Lublin.

BELZIG, a town of Germany, in the circle of Upper Saxony, and electorate of Saxony, ſeated on the Welle; 30 miles E. of Magdeburg. The prefecturate of which this is the chief town bears the ſame name.

BEMA, βημα, in *Antiquity*, denotes a ſtep or pace.

The bema made a kind of itinerary meaſure among the Greeks, whoſe length was equivalent to one cubit, and two thirds, or ten palms.

Whence alſo the term βηματιζειν, *to meaſure a road*.

Bema, in *Eccleſiaſtical Writers*, denotes the altar-part, or ſanctuary, in the ancient churches. In which ſenſe, bema made the third or innermoſt part of the church, anſwering to the chancel among us.

Bema was alſo uſed for the biſhop's chair, ſeat, or throne, placed in the ſanctuary. It was called bema, from the ſteps by which it was to be aſcended.

Bema was alſo uſed for the reader's deſk.

This in the Greek church was denominated βημα γνωσεων, in the Latin church ambo.

Bema is more peculiarly uſed for the *Manichees'* altar, which was in a different place from that of the catholics.

Bema was alſo a denomination given by this ſect to the anniverſary of the day when *Manes* was killed, which with them was a ſolemn feaſt, and a day of rejoicing.

One of the chief ceremonies of the feaſt conſiſted in ſetting out and adorning their bema, or altar, with great magnificence.

BEMBEA, or Bembi, in *Geography*, a province of the kingdom of Angola in Africa, which is divided into Higher and Lower, extending on one ſide along the ſea, and on the other dividing the kingdom of Angola from the other foreign ſtates on the ſouth. The country is populous and abounds with large and ſmall cattle, with the fat of which the inhabitants anoint their heads and bodies; and they alſo clothe themſelves with the hides, coarſely dreſſed. They are addicted to the ſame idolatrous ſuperſtitions with other parts of the kingdom, but ſpeak a quite different language. The great river Lutano, or San Francisco, waters and fertilizes moſt part of this province; but ſwarms with crocodiles, ſea-horſes and monſtrous ſerpents, which not only deſtroy much of its fiſh, but do great miſchief to the adjacent grounds.

BEMBER, a town of Hindoſtan, in the diſtrict and from Lahore to Caſhmere; at the diſtance of 33 Acbaree coſſes (each coſs being 4757 yards.) on a bearing of N. a little W. from Lahore. N. lat. 33°. E. long. 73° 30′.

BEMBEX, in *Entomology*, one of the Fabrician genera of Pilezata, and forming in the Linnæan ſyſtem, a ſection in the Vespa genus; they are diſtinguiſhed by having the tongue

tongue inflected, and five cleft; lip advanced, mouth involved. See VESPA.

BEMBO, PETER, *Cardinal*, in *Biography*, an eminent restorer of literature, was the son of Bernardo Bembo, a Venetian nobleman, and born at Venice in 1470. Having studied Latin and polite literature, in his early youth, under Urticio, he went to Messina in 1492, to pursue the study of the Greek language, under Constantine Lascaris. At Padua, whither he removed in 1495, he received instructions in philosophy from Nicholas Leonico Tomeo. Upon his father's settlement at Ferrara in 1498, he had an opportunity of forming an intimate friendship with Leoniceno, Tebaldeo, Sadoleto, and Hercules Strozzi, and he soon afterwards began to distinguish himself as a writer. His "Azolani," which were discourses on love, written in the Italian language, and so named from the castle of Azoli, where they were composed, became very popular throughout Italy. At this time he was also one of the principal ornaments of the academy, founded by Aldus Manutius in his native city. In 1512 he visited Rome, and was well received by pope Julius II. and by his successor Leo X. he was appointed secretary, with an ample salary. Although, in conformity to the licentiousness of the papal court at this time, he kept a mistress, by whom he had three children, he discharged the duties of his office to the pope's satisfaction, and was employed by him in various important embassies. In 1520, he removed to Padua, for the recovery of his health, where, upon the death of the pope, he fixed his residence, passing a tranquil life in the prosecution of his studies, and in the conversation of men of letters. To his house, which was richly furnished with books and MSS. a select collection of medals and antiquities, and a botanical garden, men of science resorted as to a literary academy. In 1539, he was nominated to the dignity of cardinal by pope Paul III. which with some reluctance he accepted, and he then removed to Rome. He was previously ordained priest; and, it is said, that he altogether changed his mode of life, and sedulously devoted himself to the duties of his ecclesiastical functions. Although he was nominated to the bishopric of Gubbio in 1541, and in 1544 translated to that of Bergamo, he resided at Rome, and was much honoured by the pope, as well as respected by persons of the first character in the court. He died Jan. 18, 1547, and was buried in the Dominican church, called St. Maria Alla Minerva. As a writer of Italian verse, cardinal Bembo formed himself upon the model of Petrarch, and contributed to reform and polish the poetry of his own country. His prose compositions are written with elegance and purity of expression, but without any distinguishing traces of genius. In his Latin style, he was "Ciceronian," to the extreme of affectation; and on this account he was censured and ridiculed for applying the terms "heros" to Christ, and "dea" to the Virgin Mary; and for using "persuasio" for faith, and for denoting Leo's election by "deorum immortalium beneficiis." Like many others of the Italian literati of that age, he seems to have thought lightly of his religious creed; and to have been more afraid of transgressing with regard to his Latinity than with respect to the decorum which religion required. To this purpose, he dissuaded a friend from reading St. Paul's epistles, lest he should injure his style; and it is said that he would never read the briefs or breviary for fear of corrupting his own Latinity. Nevertheless his own epistles have been charged with gross faults, and even solecisms. Some compositions of his early days were licentious and obscene. His "History of Venice," written in classical Latin, in 12 books, was undertaken in 1530, by the order of the council of ten, and is more admired for elegance of diction than for profundity and accuracy. His principal works are, "Epistolæ, nomine Leonis pont. Max. lib. xvi." Venet. 1536; "Epist. Familiarum," lib. vi. Venet. 1552; "Le Rime," comprehending his poetical verses, in one volume, Rom. and Venet. 1548; "Le Prose," held in high estimation by the Italians, in allusion to which Apostolo Zeno says, that "Bembo was the first who explained to his countrymen the mechanism and construction of their native language." "Historia Rerum Venetarum, lib. xii." Venet. 1551. All his works, both in Italian and Latin, were collected and published in 4 vols. fol. Venice, 1729. Gen. Dict. Gen Biog.

BEMBRIDGE POINT, in *Geography*, lies at the eastern extremity of the isle of Wight, in N. lat. 50° 40′ 15″, and W. long. 1° 4′ 45″, and is well known to seamen as a ledge that runs more than two miles into the sea, E. N. E.

BEM-CURINI, in *Botany*. See JUSTICIA.

BEMELS, in *Geography*, a town of the Netherlands, in the duchy of Luxemburg, seated on the east side of the Moselle; 2 miles N. E. of Graven Macheren.

BEMICARY POINT and BAY, are situate between Dry and Milk river, about N. W. by W. from the pitch of Portland, the southern extremity of the island of Jamaica. The point or eastern limit of the bay is in N. lat. 17° 55′. and W. long. 77° 17′.

BEMILUCIUS, in *Mythology*, a surname of Jupiter, represented young and beardless.

BEMINSTER, or BEAMINSTER, in *Geography*, a town of considerable antiquity in the county of Dorset, England. It is seated on the small river Birt, which rises near the town, and running southward falls into the British channel at Bridport harbour. This manor, and two others connected with it, belong to two of the prebends of Salisbury cathedral. Though of remote origin, Beminster does not contain any particular object of antiquity, and its chapel, a handsome large pile of building, is dependant on the parish church of Netherbury, which is nearly two miles distant. The town is large and respectable, having many manufacturers settled in it, and most of its inhabitants employed in making sailcloth, locks, copper goods, leather, &c.: and some of these trades are greatly facilitated by the water of the river Birt, and the machinery operated on by it. Beminster has suffered repeatedly and materially by fire, and the destructive sword of civil war. These two were united on the 14th of April 1644, when prince Maurice was quartered in the town, but forced to quit it on that day, as the enemy had fired it in five places. From the report of a person who visited it soon after, we are informed it was "the pityfullest spectacle that man can behold, hardly a house left not consumed by fire. There were sevenscore and four dwelling-houses, besides barns and stables burnt," and the loss sustained was estimated at above twenty-one thousand pounds. The inhabitants soon afterwards received from the parliament 2000l. with which, and other sums, they rebuilt the town; but in June 1664, it was again consumed, when the loss amounted to nearly 10,000l. In March 1781, another fire occurred here, and in a few hours upwards of fifty dwelling-houses, with several barns, stables, outbuildings, &c. were reduced to ruins. In spite of these calamitous events, Beminster is now a populous and flourishing town, consisting of 337 houses, and 2140 inhabitants. Its principal public buildings are the chapel, a free-school, an alms-house, and a market-house. The first stands on high ground at the southern side of the town, and consists of a body, two aisles, a chancel, a chantry, and a high tower. On the western front of the latter are some emblematical statues in niches. Within the chapel are some handsome monuments to the Strodes, and other families. The free-school was founded by Mrs. Frances Tucker, in 1684, for the education of twenty of the poorest boys of the town. The Rev. Samuel Hood, father of the lords Hood and Bridport, was master of this school in 1777.

The

The alms-house was built and amply endowed by sir John Strode of Parnham, bart.

In this town are one annual fair, a weekly market on Thursday, and two annual public sales for cattle, cheese, &c.

About one mile south of Beminster is Parnham, an ancient mansion belonging to sir William Oylander, bart. At East-Axneller, in this neighbourhood, is a hill of the same name, whence issue three springs, which are the sources of the rivers Axe, Bid, and Simene. Hutchins's History of Dorsetshire, vol. i.

BEMMEL, William Van, in *Biography*, a painter of landscapes, was born at Utrecht in 1630, and after having been a disciple of Herman Sachtleven, visited Rome for the improvement of his taste and knowledge. His colouring is lively and natural, but sometimes inclining too much to green; his figures, such as boats, barges, and other vessels, introduced on the rivers or stationed near the banks, are well designed, and touched with spirit. The lights and shadows of his landscapes are distributed with singular skill, and his skies are usually clear, warm, and natural. He died in 1705. Pilkington.

BEMNASIR, in *Geography*, a town of Persia, in the province of Kerman; 140 miles S. E. of Sirgian.

BEMOL, Fr. B-molle, *Ital.* in Guido's Scale of *Music*, implies B flat, the 4th of the key of F natural, and the molle hexachord.

In early times of counterpoint, before transposed keys were used, i. e. keys different from the authentic and plagal modes, (see Ecclesiastical Modes,) the 4th of a major key, descending, and 6th of a minor key, were understood to be flat, and the 7th, ascending, sharp, without being marked. And though two of the modes are in the key of D minor, and two in F major, all which require one flat at the clef, and two in E minor, and two in G major, each requiring a sharp at the clef, they were left to the divination of the singer, without characters of indication. See Hexachord and Mode.

The Abbé Feyton, in speaking of these mysteries, must be allowed to have exercised science and ingenuity, yet, it is to be feared, that the young student will be more puzzled and perplexed than enlightened by his subtilities in this article.

BEM-Posta, in *Geography*, a small town of Portugal, in the province of Tras-los-Montes, containing about 400 inhabitants.

BEN, Been, or Behen, *Oil of*, is a fine inodorous and insipid fixed oil, procured from the Ben nut, (Glans Unguentarius, Balanos Mureptiki) the fruit of the Guilandina *Moringa*.

The oil of Ben is prepared in the Levant, in Egypt, Syria, and also in Italy, by expression of the nut. Geoffroy gives the quantity of oil procured to be 30½ ounces from about 8 pounds of the nut. The oil is valuable on account of its purity, and freedom from smell and taste; hence it may be kept for a long time without altering, or becoming in any degree rancid and acrimonious. On this account it is not disposed to become drying, like so many of the other fixed oils. It is used very largely in perfumery as a basis or vehicle into which the art of the perfumer is able to infuse the fine fragrant scent of various delicate flowers, that do not of themselves retain a sufficient basis in which to fix their scent. Thus a great proportion of the oily essences of the shops are only perfumed oil of ben, and the scenting matter (which is probably a very minute quantity of essential oil) may be again separated from the oil of ben, by means of alcohol. The method of preparing this perfumed oil we have described under the article Aroma.

The unalterability of this oil would render it the most valuable substance for cerates or liniments in pharmacy, were it sufficiently common. It is actually employed for this purpose in many parts of Italy.

Ben *Dulb*, in *Geography*, a mountain of Ireland, situate partly in King's county, and partly in the county of Tipperary; 16 miles west of Kilkenny.

Ben *Cruachan*, a solitary mountain of Scotland, in Argyleshire, the elevation of which is 3300 feet above the sea.

Ben *Levagh*, a mountain of Ireland, in the county of Galway; 4 miles S. W. of Ross.

Ben *Lawres*, *Ben Ledy*, *Ben Lomond*, *Ben More*, *Ben Verlich*. See Grampian *Hills*.

Ben *Nevis*, or Benevis, a mountain of Scotland, in the Highlands, reckoned to be the highest mountain in Great Britain, being estimated at 4370 feet above the level of the sea, and yet not much above the quarter of the height of Mount Blanc. It is situated in the parish of Kilmalie, Inverness-shire. This extraordinary mountain has never been sufficiently investigated by any mineralogist: but Mr. Williams says, that it consists mostly of porphyry "of a reddish cast, in which the pale rose, the bluish, and yellowish white colours are finely blended, and shaded through the body of the stone." Many specimens of green porphyry are also intermixed, with angular specks of white quartz. A red granite also prevails, which contains a vein of lead ore impregnated with silver. On the north-east side this mountain presents a precipice nearly perpendicular, and of a prodigious height, being by some accounts 1500 feet. The view from the summit is grand, exhibiting most of the western islands, from the paps of Jura to the hills of Cullen in Skey; on the east it extends to Ben Lawres in Perthshire, and the river Ness; and the extent of view is about 80 miles. The superior half of the mountain is almost destitute of vegetation. The summit is flat, with a gentle acclivity. Snow remains in the crevices throughout the year; but here are no glaciers, nor other magnificent Alpine features. Drumalban, the "Dorsum Britanniæ," of the old writers, seems to be Ben Nevis, with the high desert moor of Ranaal, extending 20 miles to the east of that mountain. To the north-west of Ben-nevis is the long mountain of Corriarok, near fort Augustus, over which a military road has been formed in a zigzag direction. Near the foot of this mountain arises the rapid river Spey, and various other streams, all running to the west. Sinclair's Account of Scotland, vol. viii. Williams's Natural History of the Mineral Kingdom.

Ben *Wevis*, a mountain of Scotland in the Highlands, on the west of Rossshire, estimated at 3720 feet in height.

Several other mountains of Scotland are distinguished by the appellation *Ben*, in conjunction with some other word.

BENABARRI, or Benavarri, a valley, and a place of the same name, seated among the Pyrenées, in the province of Aragon, in Spain, on the frontiers of Catalonia. N. lat. 41° 55′. E. long. 0° 40′.

BENAC, a town of France, in the department of the Ille and Villaine, and chief place of a canton in the district of Redon; 8½ leagues S. of Rennes.

BEN-ALI, a populous town of Egypt, between Monfalut and Asfiut, or Siout. These three places, with Girgé, constitute the chief marts of the trade of Upper Egypt.

BENAMENIL, a town of France, in the department of the Meurte, and chief place of a canton in the district of Luneville; 2½ leagues east of Luneville.

BENARES, a tooubah or province of Hindoostan, bounded on the north and north-west by Oude, on the east by Bahar, and on the south and west by Allahabad. This district is about 120 miles long, and 100 broad; and contains, with its dependencies, 12,741 square British miles; its soil is fertile, and the

the country populous. The Zemindary of Benares, which includes all the circars of Gazypour and Chunar, conſtituted a part of the dominions of Oude, until the year 1775, when its tribute or quit-rent of 24 lacks, ſince increaſed to 40, was transferred to the Engliſh, on occaſion of the ceſſion of the province to the India Company. This Zemindary, lately in the hands of Cheet Sing, occupies the principal part of the ſpace between Bahar and Oude, ſo that only a ſmall part of the territory of the latter touches Bahar on the north-weſt. In 1786 the clear revenue of Benares amounted to 380,000l. Almoſt in every village of this province, which is in a very proſperous ſtate, a perſon is employed in teaching the youth to read and write; and they have a ſingular method of teaching reading and writing at the ſame time. The boys are collected upon a ſmooth flat of ſand, and with a finger or a ſmall reed form the letters there, which they pronounce at the ſame time. As often as the ſpace before each ſcholar is filled up with writing, it is effaced, and prepared for a new leſſon: thus the expence of pens, ink, paper, and even a houſe is avoided. The education at Benares is chiefly inſtituted for the Brahmins.

Benares, the chief city of the forementioned diſtrict, is very rich, and the moſt completely built of any. It occupies the north bank of the Ganges, and is diſtant from Calcutta by the road, about 460 miles, and by Moorſhedabad 565 miles. Its ancient name was Kaſi; but there are no notices concerning it in the works of the ancient geographers. If it had exiſted during the time of the Syrian ambaſſadors, Pliny would have noticed it, as he has done Methora or Matura, and Cliſobara, which lay near the Jumnah river. The city is about ſix miles long and four wide; and may be viewed in its utmoſt extent from the tops of the Minarets of the moſque, erected by Aurungzebe on the foundation of an ancient Hindoo temple, and lately repaired by Mr. Haſtings. It abounds in coſtly ſtructures; but Mr. Forſter, in his "Journey from Bengal to England," ſays, that the irregular and compreſſed manner which has been invariably adopted in forming the ſtreets, deſtroys the effect which ſymmetry and arrangement would have beſtowed on a city, entitled, from its valuable buildings, to a preference of any capital, ſeen by him in India; and it is alſo very injurious to the ſalubrity of the town. At Benares the number of Europeans is very ſmall; a judge, regiſter, collector, with a few civil ſervants, conſtitute the whole of the company's eſtabliſhment there; and a few private merchants and planters make up the whole ſociety. Of natives, however, the number is great; and many of the bankers are the principal creditors of the India Company, and poſſeſs immenſe fortunes. The poor in Benares are ſtill more numerous, owing to the crowd of pilgrims, who come from all parts to viſit ſo ſacred a place. Mr. Hodges, in his "Travels in India," informs us, that in examining one of the temples of Benares, he was ſurprized to find moſt of the ornamental parts of Grecian architecture in a building erected on the plains of Hindooſtan. Benares has been from time immemorial the Athens of India, the reſidence of the moſt learned Brahmins, and the ſeat both of ſcience and literature. Here, it is probable, whatever remains of the ancient aſtronomical knowledge and diſcoveries of the Brahmins is ſtill preſerved. M. Bernier (Voy. ii. p. 148.) ſaw, in the year 1668, a large hall in this city filled with the works of the Indian philoſophers, phyſicians, and poets. Sir Robert Chambers has deſcribed the obſervatory at Benares, which he viſited in 1772. (See Observatory.) He has more lately diſcovered in this city the "Surya Siddhanta," on the principles of which the whole Indian aſtronomy is founded. Several conſiderable extracts of this work have been tranſlated by Samuel Davis, eſq. to whom this valuable work was communicated. It is compoſed in the Sanſkreet language, and profeſſes to be a divine revelation, communicated to mankind more than two millions of years ago, towards the cloſe of the Sutty or Satya Jogue, the firſt of the four fabulous ages, into which the Hindoo mythologiſts divide the period during which they ſuppoſe the world to have exiſted. It appears from what is already known of this book, that independently of the fiction and romance which are blended in the account of its origin, it contains a very rational and elaborate ſyſtem of aſtronomical calculation, and ſeveral rules and tables, for the calculation of eclipſes, &c. which ſeem very much to favour the hypotheſis adopted by M. Bailly, Dr. Robertſon, and others, that aſcribes a very high antiquity to the aſtronomy of the Brahmins. In the rules contained in this work, is included a ſyſtem of trigonometry, founded on certain geometrical theorems, with which, though unknown to Ptolemy and the Greek geometricians, modern mathematicians are well acquainted. For an account of the aſtronomical computations of the Hindoos, by Samuel Davis, eſq. ſee Aſiatic Reſearches, vol. ii. p. 225, &c. 8vo. and for remarks on the aſtronomy of the Brahmins, and for an account of the principles on which the Hindoo ſyſtem of trigonometry is founded, by profeſſor Playfair, ſee Edinb. Tranſ. vol. ii. p. 135. It appears, however, from an elaborate diſſertation on the antiquity of the Surya Siddhanta, by Mr. J. Bentley, publiſhed in the Aſiatic Reſearches, vol. vi. p. 540, &c. that the ſyſtem, ſo eagerly applauded and referred to by the above mentioned writers to ſuch remote antiquity, cannot be of a greater age than 731 years; or that it was compoſed about A.D. 1068.

Notwithſtanding the ſcience and literature that have been cultivated by the Brahmins at Benares, we diſcover traces of ſuperſtition, and even of inhumanity, in ſome of their cuſtoms, which, it is hoped, the interference of the court of juſtice, eſtabliſhed there in 1783, will gradually reſtrain and reform. As the perſon of a Brahmin is inviolate, no atonement can expiate the crime of occaſioning his death. Hence originated a practice, which was formerly frequent at Benares, and which in its effects approaches the neareſt to our caption, or arreſt. The Brahmin, who adopts this expedient, in order to procure redreſs, proceeds, armed with a dagger or poiſon, to the door of his adverſary's houſe: where he deliberately ſets himſelf down, and threatens to commit ſuicide, if the offender ſhould attempt to paſs or moleſt him. He faſts with inflexible rigour, to which the other party likewiſe ſubmits, and perſeveres in his reſolution until ſatisfaction is obtained. This practice, called ſitting in "Dherna," is not confined to the male Brahmins only; for an inſtance occurred at Benares in 1789, of a widow's recurring to this expedient, in order to obtain, in a litigation with her brother-in-law, that juſtice, which neither the award of arbitration nor the deciſion of the court had granted her. Both faſted pertinaciouſly during thirteen days, when, worn out with hunger, her antagoniſt at laſt yielded the conteſt. Another inſtance occurred in 1794. An inhabitant of a diſtrict in the province of Benares ſat in Dherna before the houſe of ſome Rajepoots, for the purpoſe of obtaining the payment of "Birt," or a charitable ſubſiſtence, to which he had a claim; and in this ſituation deſtroyed himſelf by ſwallowing poiſon. Some of the relations of the deceaſed retained his corpſe for two days before the houſe of the Rajepoots, who were thus compelled to forego taking ſuſtenance, in order to induce them to ſettle the Birt on the heirs of the deceaſed Brahmin. This practice is not ſpecifically pointed out by the ſhaſter, but depends merely on the ſanction of uſage. Another practice of the Brahmins, equally

equally ſingular, and more cruel, is called erecting a "Koor." Having contracted a circular pile of wood, and placed upon it a cow, or an old woman, they prepare to conſume the whole together. The object of this practice is to intimidate the officers of government, or others, from urging importunate demands, or levying grievous exactions, as the effect of the ſacrifice is ſuppoſed to involve in great guilt the perſon whoſe conduct obliges the conſtructor of the Koor to adopt this expedient. The only caſe of ſetting up a Koor, that occurred for many years, happened near Benares in 1788; but the ſacrifice was prevented by the timely interpoſition of authority. There are a few inſtances of ſtill more atrocious acts, by which the Brahmins ſeek to repel injuries, or to wreak their feeble vengeance; as by murdering, with mutual conſent, their neareſt and moſt beloved relations, from a perſuaſion that horror of the deed will redound on the head of their oppreſſor. Sir John Shore (*ubi infra*) relates three ſhocking caſes of that nature, which, ſo late as the years 1791 and 1793, came under his cognizance in the province of Benares. It further appears by ſir John Shore's report, that a whole tribe of Hindoos, denominated "Rajekoomars," and reſident on the frontiers of Juanpore, a diſtrict of the province of Benares, adjoining to the country of Oude, have been long accuſtomed to the ſavage practice of cauſing mothers to ſtarve to death their female offſpring; and that the only reaſon aſſigned for this inhuman cuſtom was the great expence of procuring ſuitable matches for their daughters, if they ſuffered them to grow up. Meaſures have been taken and rigidly enforced for aboliſhing this barbarous practice, to which, however, there are ſome few exceptions; as certain families among the Rajekoomars allow, at leaſt, one female child to be reared, and one village furniſhes a complete exception to the general cuſtom. Among the ſuperſtitions prevailing in the province of Benares, we may mention the following circumſtance relating to the ſugar-cane. If any of the old cane remains unemployed in the new plantation, the proprietor repairs to the ſpot previouſly to the 25th of Joyte, or 11th of June, and having ſacrificed to Nagbele, the tutelar deity of that plant, he carefully ſets fire to the whole; it being firmly believed by the "ryots," or huſbandmen, that if a ſingle cane ſhould flower after that term, it would portend the moſt dreadful calamities to themſelves and their families. We ſhall here add, that faith in charms, amulets, ſorcery, faſcination, and aſtrology, ſtill prevails in the eaſt. See Soontaars. Aſiatic Researches, vol. iv. p. 329, &c. 8vo. The Hindoo obſervatory at Benares is ſituated in N. lat. 25° 18′ 36″. E. long. 83° 10′.

BENARU, a town of Perſia, in the province of Fariſtan, 108 miles S. S. E. of Schiras.

BENARVILLE, a town of France, in the department of the Lower Seine, 5 leagues N. E. of Montivilliers.

BENASCHI, John Baptist, in *Biography*, a painter and engraver, was born in Piedmont, A.D. 1636, and became a diſciple of Pietro del Po. He imitated the works of Lanfranchi ſo ſucceſſfully, that his pictures have been miſtaken for the performances of that maſter. He is repreſented as a man of great genius, and the freedom and facility, which appear in his pictures, are highly commended. He died at Rome in 1690. He etched for his amuſement "A holy family," from Dominicus Cerini, his intimate friend. Strutt.

BENATKY, or Benatek, in *Geography*, a ſmall town of Bohemia, with a citadel, in the circle of Boleſlaw, ſeated on the Iſſer, 22 miles N. E. of Prague.

BENAVARRI. See Benadarri.

BENAVENTE, a town of Spain, in the country of Leon, ſeated on the Eſla, and containing about 4000 inhabitants; 13 leagues S. of Leon.

BENAVIDIO, Marcus Mantua Benavidius, in *Biography*, a celebrated civilian, was born at Padua in 1490, and taught the civil and canon law in his native city for 60 years, with high reputation. He there received the honour of knighthood, viz. from the emperors Charles V. and Ferdinand I. and from pope Pius IV. He died in 1582, and was the author of ſeveral works in his own profeſſion; among which are "Collectanea ſuper jus Cæſareum;" "Obſervationum Legalium," lib. x. and "De Illuſtribus Juriſconſultis." Moreri.

BENBECULA, in *Geography*, is the name of one of thoſe iſlands of Scotland called the Hebrides. It lies between the iſles of N. and S. Uiſt, from the laſt of which it is ſeparated by a narrow channel, nearly dry at low water. This iſland is rather flat, and meaſures only about nine miles in tranſverſe diameter. Its ſoil is ſandy and barren; but the quantity of ſea weed conſtantly driven on ſhore, is appropriated to meliorate ſome portions of the land. In one part of the iſland is an ancient fort called Elvine Nean Ruarie, and ſeveral ſtone monuments are found in different parts of it. It has a harbour for ſmall fiſhing veſſels, and ſeveral freſh water lakes, ſtored with fiſh and fowl.

BENBRICK, a mountain of Scotland, in the county of Perth; 12 miles N. N. W. of Crieff.

BENBALBEN, mountains of Ireland, in the county of Sligo; 7 miles N. of Sligo.

BENCH. See Banc, Bank, &c.

Bench, *Amicable*. See Amicable.

Bench, *King's*. See Court *of King's Bench*.

Bench, *Free*. See Free-*bench*.

Bench *iſland*, in *Geography*, lies within the ſouth-eaſt point of what is called South-eaſt bay, in the ſouthern part of New Zealand.

Bench-*widow*. See Widow.

BENCHERS, in the *Inns of Court*, the ſenior members of the houſe, who have the government and direction thereof; and out of whom is yearly choſen a treaſurer, &c.

BENCOOLEN, in *Geography*, a ſea-port town and fort on the ſouth-weſt coaſt of the iſland of Sumatra, where the Engliſh have a ſettlement and a factory. This is one of the four Engliſh preſidentſhips, or governments, to which all the other factories are ſubordinate; the other three are Madras, Bengal, and Bombay. Bencoolen, which is about 2 miles in compaſs, is known at ſea by a high ſleader mountain, called the "Sugar Loaf," and riſing 20 miles beyond it in the country. Before the town lies an iſland, within which the ſhips uſually ride, and with this, the point of Sillebar, extending 2 or 3 leagues ſouthward of it, forms a large and commodious bay. A convenient river on its north-weſt ſide brings the pepper, of which the trade of the town chiefly conſiſts, from the inland country: but it is ſhipped with inconvenience, on account of a dangerous bar at the mouth of the river. It is principally inhabited by natives, who build their houſes on pillars of bamboo wood. The Engliſh, Portugueſe, and Chineſe, have each a ſeparate quarter. The adjacent country is mountainous and woody, and there are many volcanos in the iſland. As the town ſtands upon a moraſs, the air is loaded with vapours, and the mountains are covered with thick clouds, that produce lightning, thunder, and rain. The climate of Bencoolen has proved more ſickly and fatal than that of any of the other Britiſh ſettlements, not only to the Engliſh, but to all who have been accuſtomed to live in a pure air. In 1763, upon the ceſſion of Manilla to the Spaniards, and the reſtoration of Bencoolen to the Engliſh, many Chineſe merchants, with

their families, quitted Manilla in order to ſettle under the Engliſh government at this place; but the air of this country proved ſo fatal, that moſt of thoſe Chineſe and their families died ſoon after their arrival. Many Engliſh have alſo fallen a ſacrifice to the intemperature of this climate; and, indeed, few of them ſurvived until they built a fort on a dry elevated ſituation, at the diſtance of about 3 miles from the town. This is called "Fort Marlborough," where, during the rage of ſickneſs at Bencoolen, the garriſon is ſometimes very healthy. Tame buffaloes may here be had in great plenty; but fiſh and poultry are ſcarce and dear. The ſoil is a fertile clay, producing high graſs; but near the ſea it is a moraſs. N. lat. 3° 49′ 3″. E. long. 102. See SUMATRA.

BEND, a town of Perſia, in the province of Farſiſtan, 100 miles N. E of Schiras.

BEND *Dexter*, in *Heraldry*. The bend was a ſaſh worn acroſs the ſhoulder from the Italian la benda; it is one of the nine ordinaries in heraldry, and occupies one-third part of the eſcutcheon when charged, and one-fifth when plain; it conſiſts of two equal lines drawn diagonally from the dexter chief to the ſiniſter baſe of the ſhield. This ordinary hath more ſubdiviſions or diminutives than any of the others, viz. the bendlet, gortier, cottiſe, and ribbon, none of which diminutives can properly be charged.

BEND *Siniſter*, denotes lines drawn diagonally from the ſiniſter chief, to the dexter baſe of the ſhield; it hath not the ſame diminutives as thoſe of the bend dexter; but according to ſome heraldic writers, is ſubdivided into a ſcrafe, or ſcarf, which is in breadth half that of the bend ſiniſter; and a batton, or fiſſure, as Upton and Holme call it, containing half the breadth of the ſcarf. Here, however, ariſes an objection to the admitting the batton to be a diminutive of the bend ſiniſter, or as any part of one of the ordinaries. According to many years practice, the batton doth not touch the extremities of the ſhield, nor the extremities of the quarter where the paternal arms are placed, as all the ordinaries and their diminutives conſtantly do; but on the contrary, is couped, that is, cut ſhort, and ſo borne as a mark of illegitimacy, and not as an ordinary or charge, or any part of the coat: for, although ſome inſtances are to be met with of ancient arms, where a batton ſiniſter is paſſed from the ſiniſter chief to the dexter baſe, over all; and others, where it paſſes from corner to corner, over the paternal quarter, and not over the other quarters; yet, in every one of thoſe inſtances, the batton is uſed as a mark of baſtardy, and not either as an ordinary or charge Hence, therefore, we may fairly conclude, that the batton is not to be deemed as any part diminutive of the bend, but as a mark of illegitimacy; which mark or batton, when granted by princes to their illegitimate children, may be of metal or fur, or both; but, when granted to any under their degree, muſt be of colour only.

BENDA, in *Architecture*. See FASCIA.

BENDA, *Francis*, in *Biography*, concert-maſter to the late Frederick II. king of Pruſſia, from the year 1738 to the time of his death. He was one of the moſt touching and expreſſive players on the violin in Europe, during the laſt century. He was a native of Alt Benatky in Bohemia 1709, and a choriſter at Prague and Dreſden, till he loſt his treble voice. There is a very natural and amuſing life of this excellent muſician, compoſed from his own materials, by M. Hiller of Leipſig; but as we have no room for ſtories of mere amuſement, we muſt adhere to matters of fact.

It was not, till he was diſmiſſed as a ſinger, that he ſeriouſly applied to the fiddle to procure him a ſubſiſtence; but he knew not when or under what maſter; but remembered that, as ſoon as he was able, he joined a company of ſtrolling Jews, in playing dances about the country; in which, however, there was a blind Hebrew of the name of Löbel, who, in his way, was an extraordinary player. He drew a good tone from his inſtrument, and compoſed his own pieces, which were wild, but pretty: ſome of his dances went up to A in *altiſſimo*; however, he played them with the utmoſt purity and neatneſs.

The performance of this man excited in Benda ſo much emulation, that he redoubled his diligence in trying to equal him; and not to be inferior in any part of his trade, he compoſed dances for his own hand, which were far from eaſy. He often ſpeaks of his obligations to the old Jew for ſtimulating him to excel on the violin.

It has often excited our wonder, that in the principal capitals of Europe, wherever there is a ſynagogue, we generally found a vocal performer or two, who ſung in the Italian manner, and in exquiſite taſte, though the reſt of the ſinging in the ſervice of religion, was to the laſt degree incoherent, rude, and barbarous. Where it was acquired, or by what kind dæmon this taſte was inſpired excluſively, is not eaſy to conjecture; but ſo it was at Paris, Amſterdam, Milan, Venice, Rome, and Naples; and we have had inſtances at home of exquiſite Hebrew ſinging in our own country.

After various adventures, our young violiniſt entered into the band of count Uhlefeld at Vienna, with whom he had frequently the advantage of hearing the famous Franciſchello, who taught the count, and of playing trios with this great muſician and his ſcholar.

Franciſchello was the moſt exquiſite performer on the baſe-viol of his time. Geminiani related of him, that in accompanying Nicolini, at Rome, in a cantata compoſed by Aleſſandro Scarlatti, for the violoncello, the author, who was at the harpſichord, would not believe that a mortal could play ſo divinely; but ſaid, that it was an angel who had aſſumed the figure of Franciſchello; ſo far did his performance ſurpaſs all that Scarlatti had conceived in compoſing the cantata, or imagined poſſible for man to expreſs.

At length, Benda was invited by Quantz, the German flute maſter to the late Frederick II. king of Pruſſia, during the time when he was only prince of Pruſſia, and reſided at Ruppin, before his acceſſion to the throne.

It was by ſtealth, that this prince indulged his paſſion for muſic, during the life of his father, the late king, who had forbidden him not only to ſtudy and practice muſic, but to hear it. M. Quantz told us afterwards, that it was the late queen-mother, who at this time encouraged the prince in his favourite amuſement, and who engaged muſicians for his ſervice; but ſo neceſſary was ſecrecy in all theſe negociations, that if the king his father had diſcovered that he was diſobeyed, all theſe ſons of Apollo would have incurred the danger of being hanged. The prince frequently took occaſion to meet his muſicians a hunting, and had his concerts either in a foreſt or cavern.

Benda ſtill, in 1772, led the king of Pruſſia's band at the opera, and at his concerts; and could boaſt of having had the honour of accompanying his majeſty, during the 40 years which he had been in his ſervice, in nearly 50,000 different concerts. What an excellent economiſt of time muſt his late Pruſſian majeſty have been; who, though his own miniſter, could ſpare two hours every day, when he was not in the field, for muſic!

When we heard the admirable Benda perform, it was an excellent compoſition of his own, which he played *con fordino*; his hand, he ſaid, wanted force ſufficient to play without. The gout had long enfeebled his fingers, and age, perhaps, ſtill more. There were, however, fine remains of a great hand, though he was probably always more remarkable

able for feeling than force. His style was so truely *cantabile*, that scarcely a passage could be found in his compositions, which it would not have been in the power of the human voice to sing; and when he was at his best, he was so very affecting a player, so truly pathetic in an *adagio*, that several able professors declared that he frequently drew tears from them in performing one. How he acquired this style of writing and playing, may be of some use to musical students to trace and develope. His style was not that of Tartini, Somis, Veracini, nor that of the head of any one school or musical sect, of which we have the least knowledge: it was his own, and formed from that model which should be ever studied by all instrumental performers, *good singing*.

BENDALA, in *Geography*, a town of Africa, lying between the confines of Dar-fur and Wara, the capital of Ber-[illegible]. It is inhabited by the slaves of the sultan of Bergoo. The people are idolaters.

BENDALI, a town of Persia, in the province of Kerman, 140 miles S. of Sirgian.

BENDARMALANKA, a town of Hindoostan, in the circar of Rajamundry, situate between the branches of the river Bain, at their outlet into the ocean, 50 miles S. of Rajamundry, 50 N. E. of Masulipatam, and 358 miles N. E. of Madras. N. lat. 16° 30′. E. long. 82° 30′.

BENDEIRG, a mountain of Scotland, in the county of Perth, 7 miles N. of Blair Athol.

BENDER, formerly called *Tizina*, and denoting in the Turkish language "a pass," a fortified town of European Turkey, in Bessarabia, seated on the Dniester. It is celebrated as the place of retreat and residence of Charles XII. of Sweden, when he put himself under the protection of the Turks, after being defeated by the Russians at the battle of Paltowa in 1709; but upon refusing to leave their territory, he was attacked, taken prisoner, and removed to Adrianople, where, after a year's confinement, he returned secretly to his own dominions. It was besieged by the Russians in 1770, and after a resistance of nearly three months, surrendered to Panin, the Russian general; and the capture of this fortress was succeeded by the submission of the Tartars of Budziak and Otchakof to the Russian sceptre. The siege which Bender, in 1770, sustained from the Russians was remarkable, on account of the desperate defence made by the garrison, the carnage which attended its reduction, and the adoption on the part of the besiegers, of that dreadful instrument of modern warfare, the globe of compression. The Russian army, commanded by count Panin, opened their trenches on both sides of the river, the 30th July, after which, a furious cannonade and bombardment were begun from all quarters, and vigorously returned from the town. The garrison and inhabitants defended themselves with the utmost bravery: in sixteen days they made seven sorties, with little advantage, but great loss on both sides, and held out for more than two months with unabated courage, even when the defeat of the main army by the Russian general Romanzow seemed to deprive them of every hope of relief. The besiegers in the mean time pushed forward their mines (See MINE) with industry, particularly one of an improved construction lately invented by a French engineer, and which has been since denominated the globe of compression. In this labyrinth of mines, interwoven and inclosed one within another, it was maintained, that a certain quantity of gunpowder would cause a greater explosion, and throw up a greater portion of earth than in any other method. The globe of compression being brought to perfection, was charged with the amazing quantity of 16,000lb. of powder, and the garrison continuing obstinately to refuse every proposal of surrender, count Panin prepared for a general assault to take place on the night of the 27th of Sept. The firing of the mine was to be the signal of attack, and it was hoped, that besides ruining the outwoks, it might make a breach in some of the principal walls of the town, and bury the defenders in the ruins. The Russians themselves were apprehensive of the consequences, as it was not easy to define how far the effects of such an enormous mass of powder might extend, and the troops destined to make the assault in that quarter were stationed at a considerable distance. In fact, the globe of compression, which was blown up at 10 o'clock at night, with a most horrible concussion, shook the whole adjacent country, and, amidst the astonishment and confusion excited by this dreadful phenomenon, the attack began in three places with great fury. Nothing could restrain the impetuosity of the Russian soldiers, who pushed forward at the main point of assault. The double ditches before the glacis were passed and filled up; the double row of pallisadoes before the covered way destroyed; the main ditch surmounted, and all the outworks carried in succession. The body of the place could not oppose an effectual resistance to enemies who had already overcome such difficulties: the Russians got over the walls in every quarter, and a new and dreadful contest commenced in the dark, as well among the fortifications, as in the streets, lanes, and passages, and from the houses. The desperate resistance of the garrison and inhabitants obliged the Russians to set fire to the town, which they did in several places at the same time, but the contest nevertheless continued, amidst the ruins and the blazing houses, for the whole of the night, nor seemed decided, but by the almost total extermination of the Turks. At eight in the morning, the seraskier, with most of those that survived, retired to the citadel, which the flames had already reached. A select body of 1500 cavalry and 500 infantry, attempting to cut their way through the besiegers, were surrounded and cut off to a man. As for the seraskier, after demanding in vain an honourable capitulation, the fury of the flames, which had now reached every part of the citadel, obliged him to surrender with his followers, as prisoners of war. The fire raged for three days, and could not be restrained till it had consumed the whole city. The total number of prisoners, including the inhabitants of all ages, amounted to 11,749, of whom 5,554 were janisaries and spahis, with their commanders, besides the seraskier and two bashaws. The residue of a population of 30,000 souls, of whom one half were soldiers, perished in the storm. The Russians found in the place a vast quantity of arms, bombs, grenades, gun-powder, and other military stores, besides above 200 pieces of brass cannon, and 85 mortars. They also took 4 horse-tails, 14 batons of command, and 40 pair of colours.

Bender, hardly recovered from this blow, was again taken, but not till after a long siege, by prince Potemkin, in November 1789. It was, however, restored to Turkey by the subsequent treaty of peace in 1792. Bender is reckoned to contain between 10 and 12,000 inhabitants; and its governor is a bashaw. It is distant 100 miles W. of Otchakof or Oczakow, and as many miles S. E. of Jassy. N. lat. 47°. E long. 29° 20′.

BENDER-*Abassi*. See GOMBROON.

BENDER-*Congo*. See CONGO.

BENDER-*Delem*, a town of Persia, in the province of Farsistan, on the north coast of the Persian gulf; 130 miles W. of Schiras.

BENDER *du Ser*, a town of Persia, in the province of Kerman, 160 miles S. of Sirgian.

BENDER *Ibrahim*, a town of Persia, at the mouth of the river Ibrahim, in the Persian gulf.

Bender *Maſſin*, or *Benjar-Maſſin*, the capital of a kingdom of the ſame name in the ſouthern part of the iſland of Borneo, poſſeſſing a good harbour, formed by the river Benjar, flowing from the centre of the country almoſt due ſouth. S. lat. 2° 40′. E. long. 113° 50′.

Bender *Richer*, a town of Perſia, on the north coaſt of the Perſian gulf, in the province of Farſiſtan; 160 miles S.S.W. of Schiras.

Bender *Rigk*, a city of Perſia, in the province of Kerman, on the north-eaſt coaſt of the Perſian gulf. It is encompaſſed with walls in an indifferent ſtate, and lies north from Abuſchæhr or Buſheer. The petty ſtate, of which this is the capital, comprehends ſeveral other places in Kermeſir, which render its ſovereign in ſome meaſure dependent upon Kerim Khan. The Arabs of this principality are chiefly addicted to a ſea-faring life; the Perſians inhabiting its back parts are huſbandmen. The reigning family of Bender Rigk is of the Arabian tribe of Beni Saab, and proceeds originally from Oman; but the grandfather of one of its princes, having become a Schiite, and married a Perſian lady, this family is no longer reckoned by the Arabs among their genuine nobility. A late reigning prince of Bender Rigk, Mir Mahenna, was notorious through the country for his vices and cruelties, as one of the moſt execrable tyrants that ever exiſted. He cauſed his ſervants to murder his father in his own preſence, becauſe the old man had a predilection for his eldeſt ſon. He killed his mother, becauſe ſhe reproached him for his crimes. He cauſed his brother, and ſixteen other relations, to be aſſaſſinated, that he might eſtabliſh himſelf in the undiſturbed poſſeſſion of the throne. He drowned two of his ſiſters, becauſe a neighbouring prince had aſked one of them in marriage. He expoſes all the children that happen to be born to him. In 1765, this deteſtable monſter was under the age of thirty years. After having been twice captured by Kerim Khan, he recovered his liberty, and immediately upon his return to his own dominions began to pillage the caravans which travelled between Schiras and Abuſchæhr, and to practiſe piracy. Kerim Khan laid unſucceſsful ſiege to his capital; and when he ſent in 1765, to demand payment of the tribute due for his poſſeſſions in Kermeſir, Mir Mahenna mal-treated the officer deputed for this purpoſe, and cauſed his beard to be ſhaven. Upon which Kerim Khan ſent againſt him a powerful army, which conquered Bender Rigk and all its territories. Mir Mahenna, however, had previouſly retired with all his troops, and ſome of his ſubjects, into a deſart iſle called Khoueri, where he waited till the Perſian army retired from his country. As ſoon as they were gone, he left the iſland, expelled the garriſon from Bender Rigk, and regained poſſeſſion of his dominions. The tyrant had abandoned himſelf to drunkenneſs; and had begun to exerciſe ſuch cruelties upon his troops, that he cut off the noſes and ears of ſome of the principal officers; and yet ſo attached to him were his ſoldiers, that, in the period of his exile, he took the iſle of Karek from the Dutch. Bender Rigk is diſtant 132 miles W.S.W. from Schiras. N. lat. 29° 26′. E. long. 51° 20′.

BENDIDIA, βενδιδια, in *Antiquity*, ſolemn feaſts held by the Athenians on the twenty-firſt day of the month Thargelion, in honour of the goddeſs Diana. The word is formed of βενδις, a denomination of Diana, according to Strabo, or of the moon, according to Suidas, which amounts to the ſame. The bendidia were held in the Piræus, and bore ſome reſemblance to the bacchanalia.

BENDING, in a general ſenſe, denotes the reduction of a ſtraight body into a curve, or giving it a crooked form. M. Bernouilli has a diſcourſe on the bending of ſprings, or elaſtic bodies. (See Spring.) M. Amontons gives ſeveral experiments concerning the bending of ropes. (See Rope.) The friction of a rope, bent or wound round an immoveable cylinder, is ſufficient, with a very ſmall power, to ſuſtain very great weights. Mem. Acad. Sc. 1703. 1705. 1699. Divers methods have been contrived for bending timber, in order to ſupply crooked planks, and pieces for building ſhips. M. Daleſme ingeniouſly enough propoſed to have the young trees bent, while growing in the foreſt. The method of bending planks by a ſand-heat, now uſed in the king's yards at Deptford, was invented by captain Cumberland. Phil. Tranſ. N° 371. p. 75.

The bending of boards, and other pieces of timber for curved works in joinery, is effected by holding them to the fire, then giving them the figure required, and keeping them in this figure by tools for the purpoſe.

A method has been lately invented and practiſed for bending pieces of timber, ſo as to make the wheels of carriages without joints. See Wheels.

The uſe of ſteaming wood for the purpoſe of bending it is evidently to ſupple it, ſo as to make it capable of being brought the more eaſily into the form required, as well as to adapt it for retaining that form, after the preſſure by which it was originally reduced to that figure has been removed. By means of ſteaming, heat and moiſture are applied to it. If it has already moiſture enough, as in the caſe of green wood, heating in any other way, without the application of ſteam, may be ſufficient; or the effect may be produced by heating and wetting at the ſame time. Theſe modes of ſuppling by heat and moiſture, have been practiſed from time immemorial in Ruſſia, and applied to wheels, and ſome other ſorts of wood-work. In England theſe, or ſimilar modes, have been applied for a long time in the dock-yards, and alſo, under a patent granted to Meſſrs. Jacob and Viny, but now expired, in the conſtruction of wheels; and by Mr. Bevan, under a patent ſtill in force, to circular wooden ſaſhes, ſoffits, fan-lights, door mouldings, and hand-rails for ſtairs; and, without patent, by cabinet and chair-makers in general. When the thickneſs required, compared with the ſharpneſs of the curvature, is ſuch as to render it impracticable to bend the piece entire, it may be divided for this purpoſe into different thickneſſes, in the manner propoſed by Mr. Samuel Bentham, under a patent obtained in 1793, for methods of working wood, metals, &c. with very little, if any, loſs of ſtrength; and if the ſtrata are connected by proper faſtenings, with a degree of ſtrength far ſuperior to what a piece of the ſame dimenſions would poſſeſs, if grain-cut. In this mode, curvature may be given to the wood-work of all ſorts of engines, and of carriages of all ſorts; to all timbers deſigned for receiving a curved ſhape and employed in buildings; and to any of the timbers, that may be uſed in the conſtruction of boats or veſſels, not excepting ſhips of the largeſt claſs. Thus, it is ſaid, a very conſiderable ſaving with reſpect to quantity and value might be obtained, whilſt at the ſame time the ſtrength would be augmented.

In the operation of bending, care ſhould be taken that as faſt as you force any piece to adapt itſelf to the curvature of the mould to which you are bending it, you apply a preſſure, by means of ſcrews or wedges, &c. to that part, and along the whole piece, particularly at its ſharpeſt convexities; ſo that the piece may not only be kept to its proper curvature, but the exterior fibres be prevented from ſtarting out. In forming ſhip-ribs of all ſhapes and ſizes, ſo as to ſuperſede the uſe of crooked-grown timber, where that which is ſtraight would be cheaper, Mr. Bentham propoſes to uſe one or other of the two following methods, which, he ſays, would effectually anſwer the purpoſe. Firſt, having

having formed a mould or block to the shape of the rib in question, comprehending the whole of its extent from top to top-side, that is, on both sides of the keel, bend the component parts of the rib, according to the shape of the block, and fasten them together; then, to confine the whole rib in its curvature, apply stays or cross-bars, in those parts where the form would be most apt to change, and to convey the rib, together with its stays, till it has been sufficiently confined to its curvature, by the connection given to it with the planks, beams, and other parts of the ship. Or, secondly, you may form the shell of the ship first, without timbers, beginning to build as it were by the planks, using only a set of temporary moulds or false ribs, to determine the position of, and give a temporary support to, the planks. When this is done, insert the timbers afterwards, pressing and binding the component parts successively into their places and removing the false ribs, in proportion as the real ones are put together and secured. Or, thirdly, instead of the false ribs, you may insert a sufficient number of real ribs, put together as in the first method; and then proceed with the planks and the rest of the ribs, as in the second method. As to bending, it may, in this case, be performed with or without the assistance of steaming, and with or without the use of the expedient of dividing into thicknesses according as the degree of curvature may require. In clinker-work built boats, the ribs have been sometimes inserted by bending them to the planks, but this is only done in boats of the slightest class. See SHIP.

BENDING, in the *Sea Language*, denotes fastening one rope to another, or to different objects, and fastening a sail to its yard.—They say, *bend the cable*, when it is to be made fast to the ring of the anchor.—To *bend two cables*, signifies to tie them together with a knot, which, though less sure than splicing, is sooner done. To *unbend the cable*, is to loosen it from the ring of the anchor; which is done when a ship is designed to be long at sea. To *bend a main sail*, is to make it fast to its proper yard or stay.

BENDLET, in *Heraldry*, is the first diminutive of the bend, and possesses one half of the breadth of the bend.

BENDOAN, in *Geography*, a small island, 5 leagues S.W. from cape St. Martin's, on the coast of Spain, in the Mediterranean, which lies to the south of west from Yvica island. It is north-east from Altea, and forms the limit of the bay of Calp, or Carpi, of which the mount so called is the south-west limit.

BENDORAN, a mountain of Scotland, in the county of Argyle

BENDORF, a town of Germany, in the circle of Westphalia, and county of Sayn, and in a prefecturate of the same name, seated not far from the Rhine, into which the river Sayn empties itself at this place. It is inhabited by Roman catholics and Lutherans, each of whom enjoy the public exercise of their religion; 5 miles N. of Coblentz.

BENDORF *Road*, lies on the west coast of Ireland, and is the easternmost of the roads between Ballyshannon and the island of Murry, or Enismurry, as Bundat is the more western. In both, ships may ride with safety.

BENDS, in a ship, are the same with *wales*, or *wales*, which are the outermost timbers of a ship, on which men set their feet in climbing up.

They are reckoned from the water, the *first*, *second*, and *third bend*: they help much to strengthen the ship, and have the beams, knees, and foothooks bolted into them.

BENDS denote also the small ropes used to confine the clinch of a cable. For a *common or sheet bend*, pass the end of a rope through the bight of another rope, then round and underneath the standing part; but, to prevent its jambing, pass it round again under the standing part. The sheet of a sail has the end passed up through the clue, then round the clue, and underneath the standing part. The rope of a buoy is passed as a sheet, and has the end stopped. Bends of a cable-clinch are passed as a seizing. For a *carrick bend*, lay the end of a rope, or hawser, across its standing part; then take the end of another rope, or hawser, and lay it under the first standing part, at the cross, and over the end; then through the bight, under the standing part; then over its own standing part, and underneath the bight again: it is often used in haste to form a greater length, or to warp or tow with. For a *fisherman's bend*, take a round turn with the end of a rope, or hawser, through the ring of an anchor, &c. and a half hitch through both parts, and another half hitch round the standing part; then stop the end. *Hawser bend* is a hitch, with a throat and end seizing made on one end, and the end of another hawser reeved through the bight, and hitched with a throat and end seizing. *Temporary bend* is commonly made to reeve through large blocks, thus: lay three fathoms of the end of two hawsers together, and put on a round seizing in the middle; then reverse the ends to each standing part, and put on a throat seizing between each end and the middle, and a round seizing on each end. See *Plate* of *Ship-Rigging*.

BEND-WAYS, or *in Bend*, in *Heraldry*, is such charges as are placed so as to occupy that part of the escutcheon to which the bend is allotted; or such as are placed obliquely, resembling a bend.

BENDY, a term used in *Heraldry*, when the escutcheon is divided bendways into an equal number of partitions: the field may be bendy of eight, ten, twelve, or more.

Barry-BENDY. See BARRY.

Counter-BENDY. See COUNTER.

Paly-BENDY. See PALY.

BENE. See DE *Bene Esse*.

BENE, in *Geography*, a town of Italy, in the principality of Piedmont, and district of Mondovi, defended by an ancient castle, and containing about 4000 inhabitants; 28 miles south of Turin.

BENEAPED, in the *Sea Language*, is said of a ship, when the water does not flow high enough to bring her off the ground, out of the dock, or over the bar.

BENECARLO, BENECALON, or BENICARDO, in *Geography*, lies north-west from Peniscola point, on the coast of Valentia, in Spain, in the Mediterranean, seated on a bay to the north-east of the gulf of Valentia. It has no good road; so that ships usually lie at Peniscola.

BENEDETTO, in *Biography*. See CASTIGLIONE.

BENEDETTO, ST., a town of Italy, in the duchy of Mantua, 15 miles S.S.E. of Mantua.—Also, a town of Italy, in the marquisate of Gorzegno, 12 miles east of Bene.

BENEDICITE, in *Ecclesiastical History*, is a name given to the hymn, or song of the three children in the fiery furnace; by reason of its beginning with the words, "benedicite omnia opera Dominum." The use of the benedicite is very ancient; it appearing to have been sung in all the Christian churches as early as St. Chrysostom's time.

BENEDICT, ST., in *Biography*, founder of the monastic order of Benedictins, was born in the province of Nursia, in Italy, about the year 480. After having been educated at Rome, he retired, at the age of fourteen, to Sublaco, about 40 miles from that city, where he secluded himself from the world in a cavern for several years, till at length he was discovered by the monks of a neighbouring monastery, and chosen for their abbot. Dissatisfied, however, with their manners, he withdrew from their society to his solitude,

ſolitude, and by means of the multitude of perſons that aſſociated with him, he was enabled to build twelve monaſteries, and to place in each of them twelve monks. In 528 or 529, he retired to Monte Caſſino, and having cut down the grove ſacred to Apollo, built a monaſtery, and founded his order. Being ſummoned to the council at Rome by pope Boniface II. he was carried, by his own deſire, at the approach of death, into the oratory of St. John the Baptiſt, where, during his attention to the ſervice, he expired, in the year 542 or 543, according to Cave, or, according to others, in 547. His extraordinary miracles are recorded in the "Dialogues" of St. Gregory the Great; and by the church of Rome, he is honoured as a ſaint. The only genuine work of St. Benedict, according to Dupin, is the "Regula Monachorum;" but other works have been aſcribed to him, and they are publiſhed together in the 9th volume of the "Bibliotheca Patrum." Cave's Hiſt. Lit. t. i. p. 512. Dupin. Eccl. Hiſt. vol. iii. p. 44.

Benedict, abbot of Aniane in Languedoc, was born in 751, and educated at the court of king Pepin. Having ſerved this prince and his ſucceſſor Charlemagne, he retired to a monaſtery in Languedoc, where he diſtinguiſhed himſelf by his mortifications. He afterwards built a hermitage on the rivulet called Anian, which, in proceſs of time, became a conſiderable monaſtery. Lewis the Meek employed this monk in reforming the monaſteries, firſt in Aquitaine, and afterwards through the whole kingdom of France, and in reſtoring, by new and ſalutary laws, the monaſtic diſcipline which had been neglected and fallen into decay. In 817, he preſided in the council of Aix-la-Chapelle, and ſubjected, by the authority of the emperor, all the monks to the rule of Benedict of Monte Caſſino, preſcribed to them all one uniform mode of living, and thus united the various orders into one general body or ſociety. Hence he was regarded as the ſecond father of the weſtern monks. He died in 821. His collection of rules for the eaſtern and weſtern monks, intitled, "Codex Regularum," and his concordance of monaſtic rules, and alſo a collection of homilies of the fathers, were publiſhed by Holſtenius at Rome. This abbot has been beatified by the church of Rome. Moreri. Moſheim's Eccl. Hiſt. vol. ii. p. 310.

Benedict, Biscop, an Engliſh abbot of the ſeventh century, was born of a noble family among the Engliſh Saxons, and in the 25th year of his age devoted himſelf wholly to religion. Accordingly, in 653, he took a journey, in order to acquaint himſelf with the eccleſiaſtical diſcipline, and on his return he laboured to eſtabliſh it in Britain. Upon his return from a ſecond journey to Rome, in the courſe of which he received the tonſure, he aſſumed the government of the monaſtery of Canterbury, to which he had been elected during his abſence. After a third journey to Rome, whence he brought back a large collection of valuable books, he reſorted to the court of Egfrid, king of Northumberland, who had ſucceeded Oſwy. On a tract of land, given to him by that prince, he erected a monaſtery, which, from its ſituation on the river Were, was called "Weremouth;" in which he is ſaid to have placed 300 Benedictin monks. The church of this convent was built of ſtone by artificers fetched from France, in 674; and both the church and convent were dedicated to St. Peter. From a fourth excurſion to Rome, in 678, he returned laden with books, relics of the apoſtles and martyrs, images, and pictures. In 682, he built another monaſtery on the banks of the Tyne, four miles from Newcaſtle, called "Girwy," or "Jarron," and dedicated to St. Paul. Soon after this eſtabliſhment, he took a fifth journey to Rome, and came back enriched with a further ſupply of eccleſiaſtical ornaments. Soon after his return he was ſeized with a palſy; and at length cloſed his life in a truly Chriſtian and exem- [illegible] finger; and in one of his ex[illegible]ons to Rome, brought with him a chantor who introduced the Roman method of ſinging maſs. [illegible]

Benedict, abbot of Peterborough, in the twelfth century, was educated at Oxford, and became a monk in the monaſtery of Canterbury, and afterwards prior. By the influence of Henry II. he was elected abbot of Peterborough in 1177. He aſſiſted at the coronation of Richard I. in 1189, and was advanced to be keeper of the great ſeal in 1191. But death deprived him of this dignity in 1193. Biſhop Nicholſon ſays, that he died in 1200. Beſides his "Life and Miracles of Archbiſhop Becket," characteriſed by Leland as an elegant performance, but treated by Bale as a mere heap of lies and forgeries, he compoſed a "Hiſtory of Henry II. and Richard I. from 1170 to 1192," which, ſays Dr. Henry, hath been much and juſtly eſteemed by many of our greateſt antiquaries, as containing one of the beſt accounts of the tranſactions of thoſe times. A beautiful edition of this work was publiſhed at Oxford, in 2 vols. by Mr. Hearne, A. D. 1735. Henry's Hiſt. vol. vi. p. 143.

Benedict, Alexander, one of the early cultivators and reſtorers of anatomy, was born at Verona about the middle of the 14th century. After travelling over various parts of Greece, he returned to Italy, and was appointed teacher of anatomy at Padua, where his lectures were numerouſly attended. In 1497, he publiſhed "Anatomicen, ſive hiſtoriam corporis humani." The firſt edition was dedicated to the emperor Maximilian, with whom he appears to have been in great favour. It is principally copied from Galen, but with ſome obſervations from his own practice. He is the firſt, Haller ſays, that deſcribed the concretions called gallſtones. The language uſed by Benedict, is much purer than is found in any of the early anatomical writers. "De omnium a vertice ad plantam morborum ſignis, cauſis, &c." fol. 1500, taken principally from Galen, Paulus Ægin. & Oribaſius, whoſe works he appears to have read in their own language. He alſo wrote, "De Peſtilentia," "De Medici Officio," and other ſmaller pieces. The whole of his works were collected, and publiſhed under the title of "Opera Omnia," fol. Venet. 1533. Haller. Bib. Anat. Eloy. Dict. Hiſt.

Benedict, a name aſſumed by ſeveral of the popes. The firſt of this name, called by the Greeks *Bonoſus*, was advanced to the pontifical chair in 574, at the period when the Lombards overran Italy, and fixed their ſeat in it under Alboin; and he is ſaid to have died after four years, in conſequence of the grief occaſioned by their ravages. *Benedict* II. was elected in 683, and diſtinguiſhed by his learning and virtues. He died in 685, and obtained the honour of canonization. *Benedict* III. was advanced to the pontificate in 855, and by the firmneſs of the Roman clergy, ſupported on the papal throne in oppoſition to Anaſtaſius, which he occupied with mildneſs, piety, and charity. In his time, Ethelwolf, king of the weſt Saxons, viſited Rome with his ſon Alfred. Two epiſtles of this pope are extant. *Benedict* IV. was raiſed to the papal chair about the year 900: and died with a good character in 903. *Benedict* V. was elected pope in 964, and although he was a man of extraordinary learning and ſanctity, he was ſtripped of the pontifical and prieſtly dignity by the authority of the emperor Otho, and ſentenced to exile; upon which he retired to Hamburgh, where he died

died in 965 or 966. *Benedict* VI. was elevated to the papacy in 972; and being seized by a faction which attacked the Lateran palace, he was imprisoned in the castle of St. Angelo, where he was either strangled or famished in 974. *Benedict* VII. was elected in 975, and after a prudent government of nine years, died in 984. *Benedict* VIII. was made pope in 1012, but displaced by Gregory an anti-pope, and afterwards restored. Under his pontificate Henry, king of Germany, marched to Rome; and Benedict crowned him emperor under the title of Henry II., and his queen Cunegunda, empress. In 1016, this pope, collecting his dependents, defeated the Saracens, who made a descent at Luna in Tuscany, and put them all to the sword. He also waged war with the Greeks, who ravaged Puglia. In 1019, the emperor bestowed on him and his successors the newly erected see of Bamberg. He died, after having approved himself a great friend to the monks, and zealous for the order and discipline of the church, in 1024. *Benedict* IX. succeeded his uncle John XIX. in 1033, in his 18th year; was expelled from his see on account of his vices, but restored by the emperor Conrad; and after a life of various expulsions and restorations, finally resigned the pontificate in 1045. He resumed it, however, occasionally under succeeding pontificates, and finished his scandalous career in 1054. *Benedict* X. was elected to the popedom by a party in 1058, and after holding the see nine months and twenty days, was deposed and excommunicated. *Benedict* XI. was the son of a shepherd, or of a notary, at Trevigi, in the state of Venice, became a schoolmaster, general of the Dominicans, and cardinal bishop, first of Sabina, and afterwards of Ostia, and succeeded pope Boniface VIII. in 1303. He exerted himself by various efforts for the good of the church, but death terminated his labours on the ninth month of his pontificate, A.D. 1304. This pope conducted himself with moderation, and behaved with singular respect to his mother and relations; but would not suffer any interference on their part in public affairs. He wrote commentaries on the books of Job, the Psalms, St. Matthew, and the Revelations, as well as a ritual, and some sermons. *Benedict* XII. was the son of a miller in the county of Foix, and after several subordinate ecclesiastical promotions, was advanced to the papal see in 1334. He was skilful in law and theology, and distinguished by his probity, but little versed in politics. Wishing to restore the apostolic see to Italy, but obliged by the circumstances of the times to remain at Avignon, he laid the foundation of a magnificent and strongly fortified palace, which, however, he did not live to finish. He observed a laudable caution in the creation of cardinals, and the appointment of benefices; and he exercised singular self-denial with respect to his own relations, observing, that "James Fournier (his family name) has relations, but pope Benedict none." As he was industrious and active in restoring discipline and morals among several religious orders that were become corrupt, he incurred the ill-will and calumny of the monks. During his efforts for reconciling the kings of England and France, he was seized with an illness, which terminated his life in 1342. Among his printed works are his "Decretum de animabus separatis," and his "Constitutions for the reforms of various religious orders." He left also sermons for the chief festivals of the year, commentaries on the Psalms, letters, and poems. *Benedict* XIII. was of a noble family, being the eldest son of the duke of Gravina, in the kingdom of Naples, and born at Rome in 1649. Against the views and wishes of his family, he took the habit of the Dominican order in 1667, and applied with diligence to the studies and duties of his office, preferring the humble life of a monk to that of a superior station. However, by the alliance of his family with that of the pope Clement X. he was promoted, against his inclination, to the cardinalate in 1672; and after several successive advancements to different sees, in which he maintained the character of an exemplary pastor, he was elected to the papacy in 1724, and constrained to accept it against his own remonstrances. In the exercise of his office, he laboured incessantly in repressing the luxury of the pontifical court, and in correcting the licentiousness of the clergy; but he was thwarted in his projects by the Jesuits, on account of his attachment to the Dominican doctrine concerning grace and predestination, which less resembled theirs than that of the Jansenists. His well-meant attempt to unite all Christian saints in one church and faith, manifested a greater degree of charity, than of discernment and knowledge of the world. Avoiding all the pomp connected with its high station, and restricting the expences of his own table to 6d. per day, in the disuse of wine and animal food, he lived in the Vatican like a monk in his cloister. Nevertheless, the doors of his palace were always open to the poor, and he was ever ready to hear their complaints, and to the utmost of his power to relieve their distress. Divesting himself of all the marks of sovereignty, and wishing even to dismiss his guards, he frequently went out in the evening in the most private manner, for the purpose of visiting the sick. He closed his pontificate of six years, in 1730, at the age of 80 years. His sermons, poems, and other writings, together with his bulls, were published at Rome in 3 vols. fol. in 1728. *Benedict* XIV. was descended of the noble family of Lambertini, at Bologna, and born in that city in 1675. After several previous promotions, he received a cardinal's hat in 1728; and from the archbishopric of Bologna, to which he was nominated by Clement XII. in 1731, he was advanced in 1740 to the papal see. Possessing a gaiety of temper, united with profound learning, an elegant taste, liberal sentiments, and great goodness of heart, he was singularly amiable; and as he diminished the number of festivals, abolished idle ceremonies, and manifested a dislike of superstitious practices and pious frauds, he was calumniated by some of his enemies as a "protestant pope." As a munificent patron of literature, he founded academies at Rome, bestowed benefactions on that of Bologna, corresponded with, and rewarded learned men at home and abroad, caused a meridian line to be drawn, reared from the dust the celebrated Egyptian obelisk, called that of Sesostris, and adorned Rome with various other monuments of antiquity. Fond of the pleasures of literary retirement, and of occasionally enjoying the mirth of the lower classes, his aversion to business was invincible, and he frequently lamented the drudgery and fatigue of his official situation. Attached to life, he dreaded the symptoms of dissolution; and, as it were, confiding in the prayers of the Jesuits for his life, he would not consent to sign the bull for the reform of their order in Portugal, till he was absolutely given over. On the king of Portugal he conferred the title of "his most faithful majesty." He governed the church with great mildness, and manifested on all occasions a strong desire of conciliating those differences with regard to doctrine by which it was divided. After a pontificate of 28 years, he died in 1758, at the age of 83 years. His works have been published at Rome in 12 vols. 4to.; and they display a greater degree of professional knowledge and of application, than his levity and facetious disposition would lead one to expect. Bower's Hist. of the Popes. Mosheim's Eccl. Hist. Nouv. Dict. Hist.

Benedict, St. in *Geography*, a town of Hungary, seated on the Gran, with a fortified castle; 30 miles north of Gran.

Benedict, a town of America, in Charles county, Maryland,

ryland, on Patuxent river; opposite Mackall's ferry; 30 miles south-east from the Federal city.

BENEDICTINS, or Benedictin *Order*, in *Ecclesiastical History*, is an order of monks, who profess to follow the rule of St. Benedict, which he formed only for the Cenobites, or for those who live in a monastery under the direction of an abbot.

Having given instructions as to the qualifications and duty of the abbot, he proceeds to recommend to the monks obedience, silence, and humility; to note the hours for divine service by day and night, as well as the order and manner of performing it; and to specify the punishments that were to be inflicted on offenders. These punishments were to be excommunication, or a separation from the fellowship of the brethren, at table or at prayers; the chastisement of the more disorderly with rods; and expulsion from the monastery. He further states the mode of their admission, the dress they were to wear, and the labour in which they were to be employed. From his rule, which is still extant, we learn that it was not his intention to impose it upon all the monastic societies; for he expressly excludes the Anachorets, who, having learned the exercises of a monastic life in a convent, retired separately into deserts, the Sarabaites, who live two or three together in a cell, and the Gyrovagi, who removed from one monastery to another without fixing anywhere. It was his purpose to form an order, whose discipline should be milder, their establishment more solid, and their manners more regular, than those of other monastic bodies; and whose members, during the course of a holy and peaceful life, were to divide their time between prayer, reading, the education of youth, and other pious and learned labours. However, in process of time, the followers of this celebrated ecclesiastic degenerated very lamentably from the piety of their founder, and lost sight of the duties of their station, and the great end of their establishment. Having acquired immense riches from the devout liberality of the benevolent, they sunk into luxury, intemperance, and sloth, abandoned themselves to all sorts of vices, extended their zeal and attention to worldly affairs, took part in political cabals and court factions, made a vast augmentation of superfluous rites and ceremonies in their order, to blind the multitude, and supply the place of their expiring virtue; and among other meritorious enterprises, laboured most ardently to swell the arrogance, by enlarging the power and authority of the Roman pontiff.

This new order made a very rapid progress in the west, and, in a short interval of time, arrived at the most flourishing state. In Gaul, its interests were promoted by Maurus; in Sicily and Sardinia, by Placidus; in England, by Augustin and Mellitus; in Italy, and other countries, by Gregory the Great, who himself is reported to have been for some time a member of this society; and in Germany it was afterwards received by the instrumentality of Boniface. This sudden and amazing progress of the new order was ascribed by the Benedictins to the wisdom and sanctity of their discipline, and to the miracles wrought by their founder and his followers. But upon a more attentive view, the impartial observer will be convinced, that the protection of the Roman pontiffs, to the advancement of whose grandeur and authority the Benedictins were most servilely devoted, contributed much more to the lustre and influence of their order than any circumstances, nay, than all other considerations united together.

The Benedictins are those properly called *monachi, monks;* the other orders are better denominated *friars*, or *religious*. In the canon law, the Benedictins are called *Black Monks;* being distinguished from the other orders by the colour of their habit, and not by the name of their patriarch St. Benedict. Among us they were formerly also denominated *Black Friars*. The Benedictins wear a loose black gown, with large wide sleeves, and a capuche on their heads, ending in a point behind. The list of saints of the Benedictin order is very ample; but they are accused by Baronius, and many other writers, of putting many in the list who were never of the order. For six hundred years after the erection of the Benedictin order, most of the European monks were followers of this rule: whatever other names they went by, Carthusians, Cistercians, Grandimontenses, Premonstratenses, Cluniacs, &c. they were but different branches of the Benedictins, till about the year 1220, when the Dominicans and Franciscans took new rules. Hospinian reckons no less than twenty-three religious orders that sprang from this one. According to the Benedictin computation, there have been of this order 24 popes, 200 cardinals, 7000 archbishops, 15,000 bishops, 15,700 abbots, 4000 saints, 40,000 confessors, above 3000 martyrs and apostles, who have converted 30 provinces to the Christian faith, besides emperors, kings, &c. This order has produced a great number of eminent writers and learned men.

The Benedictins, though but one order, are divided into several congregations, which have their peculiar customs and observances different from the rest. Each of these is subdivided into provinces, which have their general chapters. This order is said to have been brought into England about the year 596. The English congregation, which had subsisted from the time of the mission of St. Austin, was destroyed under Henry VIII. and by degrees reduced to one single man, father Buckley; who, in 1607, procured a reestablishment of the congregation at Doway, in the Netherlands, where it still subsists in a kind of dependency on that of St. Valladolid in Spain. At the general chapters, they chuse provincials, with their assistants, for each of the provinces of Canterbury and York, who have jurisdiction over the missionaries employed therein. They are governed by a president-general, and three definitors, chosen every three years. At their admission they make a fourth vow, *viz.* that they will go to the mission in England, and return when their superiors think fit.

Benedictin *Nuns*, are religious women, who embrace the rule of St. Benedict.

BENEDICTION, in a general sense, the act of blessing, or giving praise to God, or returning thanks for his favours. Hence also benediction is still applied to the act of saying grace before or after meals. Neither the ancient Jews, nor Christians, ever ate without a short prayer. The Jews are obliged to rehearse a hundred benedictions per day; of which, eighty are to be spoken in the morning. Vitring. de Synag. Vet. lib. iii. Rabbi Nehemiah Baruch, in 1688, published a discourse on the manner wherein the sacerdotal benediction is to be pronounced. In the synagogue of Ferrara, it is rather sung than spoken. Among the ancient Jews, as well as Christians, benedictions were attended with the imposition of hands; and Christians, in process of time, added the sign of the cross, which was made with the same hand, elevated or extended. Hence, in the Romish church, benediction was used to denote the sign of the cross, made by a bishop or prelate, from an idea that it conferred some grace on the people. The custom of receiving benediction by bowing the head before the bishops, is very ancient, and was so universal, that emperors themselves did not decline this mark of submission. Under the name benediction the Hebrews also frequently understand the presents which friends make to one another, in all probability because they are generally attended with blessings

and compliments, both from those who give and those who receive them.

Benediction, *Nuptial*, the external ceremony performed by the priest in the office of matrimony. The nuptial benediction is not essential to, but the confirmation of a marriage in the civil law.

Benediction, *beatic*, *benedictio beatica*, is the *viaticum* given to dying persons. The pope begins all his bulls with this form: "Salutem et apostolicam benedictionem."

Benediction, *regular*, that conferred by abbots on their monks, or by a senior monk on a junior.

Benedictione *privari*, to be deprived of benediction, was a kind of punishment inflicted on monks, whereby, when the rest received the abbot's blessing, the offenders were dismissed without it.

Benediction is also used for an ecclesiastical ceremony, whereby a thing is rendered sacred or venerable. In this sense benediction differs from consecration, as in the latter unction is applied, which is not in the former. Thus the chalice is consecrated, and the pix blessed, as the former, not the latter, is anointed; though in the common usage these two words are applied promiscuously. The spirit of piety, or rather of superstition, has introduced into the Romish church benedictions for almost every thing. We read of forms of benedictions for wax-candles, for boughs, for ashes, for church-vessels, and ornaments; for flags or ensigns, arms, first-fruits, houses, ships, paschal eggs, *cilicium*, or the hair-cloth of penitents, church-yards, horses, mules, &c. which are sprinkled with holy water.

Benediction *of Arms*, was a sort of public consecration of the weapons and ensigns, before the entering on a war, by a *formula* of words, and ceremonies appointed for that purpose.

BENEDICTIONALIS Liber, an ancient church book, containing the forms of the divers sorts of benedictions given by bishops, priests, &c. Such was the benedictionalis liber of Gregory the Great, described by Lambecius.

BENEDICTUM, an epithet, formerly given to lenient or gentle operating medicines, more especially rhubarb. In this sense we find, in some dispensatory writers, *benedictum laxativum* used for lenitive electuary. Though in others, *benedicta laxativa*, or the *blessed laxative*, denotes another easy purge, made up of turbith, diagrydium, spurges, hermodactyls, anise-seeds, fennel-seeds, sal gemmæ, and honey. Schroder also gives the appellation *aqua benedicta* to his emetic; and Mynsicht does the same to his *aqua serpylli*, or water of wild thyme. Some have called the philosopher's stone *lapis benedictus*.

Benedictum Vinum. See Vinum.

BENEDICTUS Carduus. See Thistle.

BENEDITTO Sacco. See San Benito.

BENEFACA, in *Geography*, a town of Spain, in the province of Valencia, 10 leagues from Valencia.

BENEFICE, Beneficium, in the *Feudal System*, is a term applied to those portions of land which the kings and chieftains bestowed on their adherents. As long as they had no fixed property in land, they could only bestow an horse, a suit of armour, or such like recompences, on those who in peace or war were attached to their persons, and devoted to their service. But upon their settling in the countries which they conquered, and when the value of property came to be understood among them, they conferred upon their followers the more substantial recompence of land. Accordingly the term benefice was the primitive name, and most simple form of the feudal possessions. These grants were called "beneficia," because they were gratuitous donations; and they were also called "honores," because they were regarded as marks of distinction. What were the services originally exacted in return for these "beneficia," cannot be determined with absolute precision; because there are no records so ancient. M. de Montesquieu (Sp. of Laws, b. iii. c. 3. & 16.) considers these "beneficia" as fiefs, which originally subjected those who held them to military tenure. M. de Mably (Observ. sur l'Histoire de France, i. 356.) contends, that such as held them were at first subjected to no other service than what was incumbent on every free man. But when it is considered, that allodial property subjected those who possessed it to serve the community, it is reasonable to conclude, that "beneficia" subjected such as held them to personal service and fidelity to him from whom they received these lands. They were granted originally only during pleasure. (See Montesq. ubi supra, and Du-Cange voc. *Beneficium* and *Feudum*.) But the possession of benefices did not continue long in this state. A precarious tenure during pleasure was not sufficient to satisfy those who held it, and to attach them to their superior lord; and, therefore, they soon obtained the confirmation of their benefices during life. (Du-Cange Gloss. voc. *Beneficium*.) After this it was easy to obtain or extort charters rendering "beneficia" hereditary, first in the direct line, then in the collateral, and at last in the female line. Leg. Longob. lib. iii. tit. viii. Du-Cange.

It is not easy to ascertain the precise period when each of these changes took place. M. de Mably (ubi supra, tom. i. p. 103—160. 429.) conjectures, with some probability, that Charles Martel first introduced the practice of granting "beneficia" for life; and that Louis le Debonnaire was among the first who rendered them hereditary. Mabillon, however, (De Re Diplomatica, l. vi. p. 353.) has published a placitum of Louis le Debonnaire, A.D. 860, by which it appears, that he still continued to grant some "beneficia" only during life. And in 889, Odo, king of France, granted lands to Ricabodo "fideli suo jure beneficiario et fructuario," during his own life; and if he should die, and a son were born to him, that right was to continue during the life of his son. This was an intermediate step between fiefs merely during life, and fiefs hereditary to perpetuity. While "beneficia" continued under their first form, and were held only during pleasure, he who granted them not only exercised the "dominium," or prerogative of superior lord, but he retained the property, giving his vassal only the usufruct. But under the latter form, when they became hereditary, although feudal lawyers continued to define a "beneficium" agreeably to its original nature, the property was in effect taken out of the hands of the superior lord, and lodged in those of the vassal. At length the word "feudum" came to be substituted in the room of "beneficium;" but Muratori observes (Antiq. Med. Ævi, v. 1. p. 594.) that no instance of this kind occurs in any authentic charter previous to the eleventh century: and Dr. Robertson (Hist. Ch. V. vol. i. p. 269.) informs us, that a charter of king Robert of France, A.D. 1008, is the earliest deed in which he has met with the word "feudum."

Benefice, *Beneficium*, in an *Ecclesiastical Sense*, a church endowed with a revenue for the performance of divine service; or the revenue itself, assigned to an ecclesiastical person for life, in return for his performing the service of the church.

All church preferments, except bishoprics, are called *benefices*; but they must be given for life, not for years, or at will: and all benefices are, by the canonists, sometimes called *dignities*. But we now ordinarily distinguish between benefice and dignity, by applying the word *dignity* to bishop-

rics, deaneries, archdeaconries, and prebends; and benefice to parsonages, vicarages, and donatives.

There is an obvious reference in the term benefice to the feudal system, which was incorporated in all the governments of Europe. As the lands of all private proprietors were holden of the prince, and because they were originally gratuitous donations, denominated "*beneficia*," the pope assumed the privilege of a feudal lord, and claimed the authority of distributing the preferments of the church at pleasure, which commenced first in Italy, and gradually extended itself to England; and hence the care of the souls of a parish came to be called a benefice. Blackstone's Comm. vol. iv. p. 106.

Hence, doubtless, came the term benefice to be applied to church livings; for, beside that the ecclesiastics held for life like the soldiers, the riches of the church arose from the beneficence of princes.

In all Christian churches, the benefices of the clergy are a sort of freeholds, which they enjoy, not during pleasure, but during life or good behaviour. If they held them by a more precarious tenure, and were liable to be turned out upon every slight disobligation either of the sovereign or of his ministers, it would perhaps be impossible for them to maintain their authority with the people, who would then consider them as mercenary dependants upon the court, in the sincerity of whose instructions they could no longer have any confidence.

As to the origin of ecclesiastical benefices, it is hard to determine when the revenues of the church were first divided: it is certain that, till the fourth century, all the revenues were in the hands of the bishops, who distributed them by their economy; they consisted principally in alms, and voluntary contributions. As the church came to have lands, parts thereof were assigned for the subsistence of the clerks, and called benefices; of which we find some traces in the fifth and sixth century: but then there does not appear to have been any certain partition, nor any precise quotâ allotted to each particular; but the allotments were absolutely discretional till about the twelfth century.

At first, each was contented with a single benefice, but pluralities were by degrees introduced on pretence of equity: for a single benefice being sometimes scarce thought a competency, the priest was allowed two; as his quality or occasions increased, so the number of benefices that were to support him were increased too. Hence some, affecting to equal princes in quality, pretend to revenues answerable to it.

The canonists distinguish three ways of vacating a benefice, viz. *de jure*, *de facto*, and *by the sentence of a judge*. A benefice is vacated "de jure," when the person enjoying it is guilty of certain crimes, expressed in laws, as heresy, simony, &c. A benefice is vacated "de facto," as well as "de jure," by the natural death, or the resignation of the incumbent; which resignation may be either express or tacit; as when he engages in a state, &c. inconsistent with it; as among the Romanists, by marrying, entering a religious order, or the like. A benefice becomes vacant "by the sentence of a judge," by way of punishment for certain crimes, as concubinage, perjury, sorcery, &c. See DEGRADATION.

Benefices are divided by the canonists into *simple* and *sacerdotal*. In the first there is no obligation but to read prayers, sing, &c.: such are canonries, chaplainships, chantries, &c. The second are charged with the cure of souls, or the direction and guidance of consciences: such are the vicarages, rectories, &c.

The Romanists, again, distinguish benefices into *regular* and *secular*. *Regular* or *titular* benefices are those held by a religious, or a regular, who has made profession of some religious order: such are abbeys, priories conventual, &c. Or rather, regular benefice is that which cannot be conferred on any but a religious; either by its foundation, by the institution of some superior, or by prescription. For prescription, forty years possession by a religious makes the benefice regular. *Secular* benefices are those which are only to be given to secular priests, i. e. to such as live in the world, and are not engaged in any monastic order. All benefices are reputed secular, till the contrary is made appear. They are called "secular benefices," because held by seculars; of which kind are almost all cures. Some benefices, regular in themselves, have been secularised by the pope's bull.

A BENEFICE *in commendam*, is that, the direction and management whereof, upon a vacancy, is given or recommended to an ecclesiastic for a certain time, till it may be conveniently provided for. See COMMENDAM.

BENEFICE, *Possession of a.* See POSSESSION.

BENEFICIARII, in *Roman Antiquity*, denote soldiers who attended the chief officers of the army, being exempted from other duty. Beneficiarii were also soldiers discharged from the military service or duty, and provided with "beneficia" to subsist on. These were probably the same with the former, and both might be comprised in the same definition. They were old experienced soldiers, who, having served out their legal time, or received a discharge, as a particular mark of honour, were invited again to the service, where they were held in great esteem, exempted from all military drudgery, and appointed to guard the standard, &c. These, when thus recalled to service, were also denominated *evocati*; and before their recall, *emeriti*.

BENEFICIARII was also used for those raised to a higher rank by the favour of the tribunes, or other magistrates. The word "beneficiarius" frequently occurs in the Roman inscriptions found in Britain, where *consulis* is always joined with it; but besides *beneficiarius consulis*, we find in Gruter *beneficiarius tribuni*, *pretorii*, *legati*, *præfecti*, *proconsuls*, &c.

BENEFICIARY, in a general sense, something that relates to benefices.

BENEFICIARY, *beneficiarius*, is more particularly used for a beneficed person, or him who receives and enjoys one or more benefices.

BENEFICIARY is more particularly used among *Roman Writers*, for a person exempt from public offices. In which sense, beneficiarii stand contradistinguished from *municipes*: It also denotes, in *Middle Age Writers*, a feudatory or vassal: and it is also used for a clerk or officer, who kept the account of the *beneficia*, and made the writings necessary for it. The same denomination was likewise given to the officers who collected the rents and duties belonging to the *fiscus*.

BENEFICIO. See DEPRIVATION *à Beneficio*.

BENEFICIO, *Suspensio à*. See SUSPENSION.

BENEFICIO *primo ecclesiastico habendo*. See PRIMO.

BENEFIELD, SEBASTIAN, in *Biography*, an eminent English divine, was born at Prestonbury, in Gloucestershire, in 1559, and educated at the university of Oxford, where he occupied the chair of Margaret professor of divinity for 14 years with great reputation. Towards the close of his life he retired to his rectory of Meysey-Hampton, near Fairford, in his native country, and there died in 1630. Dr. Benefield was so eminent a scholar, disputant and divine, and particularly so well versed in the fathers and schoolmen, that he had not his equal in the university. In his theological opinions he was a rigid Calvinist; and in his general conduct he was remarkable for strictness of life and sincerity. His

His works, consisting of commentaries on the 1st, 2d, and 3d chapters of Amos, sermons and lectures in divinity, are now sunk into oblivion.

BENEFIT, is used for a privilege granted to some person, as of an immunity, or the like.

Benefit *of Clergy*. See Clergy.

BENENAIM, Benenath, Benenasch, or Benenat, in *Astronomy*, the outermost star, of the second magnitude, in the tail of the *Ursa major*.

This is sometimes also called *alalioth*.

BENENCASA, Count, a Venetian nobleman, born in 1745, not more distinguished by his birth than talents, taste, and knowledge in literature, is confessed, by M. Laborde, in his "Essai sur la Musique," in 4 vols. 4to. published at Paris in 1780, to have furnished him with the chief part of his information concerning the poets, composers, musicians, and authors of Italy; and for enriching his researches. M. Laborde acknowledges with gratitude his obligations. See vol. iii. of "Essai sur la Mus." where there are many articles concerning Italian composers and singers with which count Benencasa has furnished the editor, that breathe the true spirit of taste, sensibility, and knowledge. This acknowledgement had escaped us in the first perusal of M. Laborde's work; but we always thought the articles concerning the Italian composers and singers in this work, of a different colour from the rest of the book: more liberal, more enthusiastic for genius and talents, and a taste more discriminative and refined, than either that of M. Laborde, or his guide, the Abbé Rousser.

When the account of the commemoration of Handel was writing, the editor being very desirous to know what judicious foreigners thought of those exhibitions, particularly Italians, accustomed to good music in their churches, as well as theatres, he applied to count Benencasa, who was then in London, and had been present at the performance of the Messiah in Westminster-abbey, for information concerning the comparative grandeur and excellence of the band, with any other which he had heard, or of which history or tradition had preserved the memory in his own country. As they had not time for a full discussion of the subject, when it was first proposed, *vivâ voce*, signor Benencasa was so obliging as to honour him with his opinion in a letter, which, before his departure from England, he entreated his permission to publish, and it will not only serve as an honourable record of this stupendous exhibition, but must have been the more flattering to the projectors of the plan, as the count is an excellent judge of music; having heard, read, meditated, and written on the subject, with a degree of feeling and intelligence, that is equally honourable to himself and the art. For this letter, see the commemoration of Handel, p. 115.

BENEPLACITO, Ital. a music term, implying at pleasure; equivalent to *ad libitum*, *al suo piacere*; which see.

BENERMOID, in *Geography*, a mountain of Scotland, in the county of Sutherland.

BENESCHAU, a town of Silesia, in the province of Oppau, 8 miles east of Troppau.

BENESSOW, a town of Bohemia, in the circle of Kaurzim, in which fairs are held.

Benessow, *Bensen*, *Pensen*, or *Panzen*, a town of Bohemia, in the circle of Leutmeritz, 6 miles S. S. W. of Kamnitz; famous for the manufacture of the best paper that is made in Bohemia.

BENET, a town of France, in the department of Vendée, and chief place of a canton, in the district of Fontenay le Comte, 3½ leagues south-east of Fontenay.

[illegible] peninsula of the island of St. Domingo, and forming with the line to Petit Goave on the north side, the narrowest part or isthmus. N. lat. 18° 20′. W. long. 72° 47′. The cape is the west point of the bay, and cape Jacquemel the east point, nearly east and west from each other.

BENETTO, a river in the island of Ceylon, 2 miles south from Barberain island, having on the south side a small fort upon a hill, under which is a good road in 15 fathoms.

BENEVEN, a mountain of Scotland, in the county of Inverness, 21 miles east of Fort William. See Ben *Nevis*.

BENEVENTE, a town of France, in the department of the Creuse, and chief place of a canton, in the district of Bourganeuf; 10 miles N. N. W. of Bourganeuf. The place contains 1141, and the canton 8378 inhabitants: the territory includes 225 kiliometres and 12 communes.—Also, a town of Spain, in the province of Leon, seated on the river Esla. N. lat. 42° 4′. W. long. 5° 5′.

BENEVENTO, a city of Italy, in the kingdom of Naples, in a duchy of the same name, comprehending, besides the city, a district of some miles. This capital of the Principatro Ultra, or principality of Benevento, and see of an archbishop belonging to the pope, is situated at the point of a hill, between two narrow vallies, in one of which runs the river Sabato, and in the other the Calore, near the confluence of these two streams. N. lat. 41° 6′. E. long. 14° 57′.

One of the entrances into the city is through the arch of Trajan, now called the "Porta Aurea," which is in tolerable preservation, and one of the most magnificent remains of Roman grandeur out of Rome. The architecture and sculpture are both singularly beautiful. This elegant monument was erected in the year of Christ 114, about the commencement of the Parthian war, and after the submission of Decebalus had entitled Trajan to the name of Dacicus. The order is composite; the materials, white marble; the height, 60 palms; length, 37½; and depth, 24. It consists of a single arch, the space of which is 20 palms, and the height 35. On each side of it, two fluted columns, upon a joint pedestal, support an entablement and an attic. The intercolumniations and frize are covered with basso-relievos, representing the battles and triumph of the Dacian war. In the attic is the inscription. As the sixth year of Trajan's consulate, marked on this arch, is also to be seen on all the military columns erected by him along his new road to Brundusium, it is probable, the arch was built to commemorate so beneficial an undertaking. No city in Italy, Rome excepted, can boast of so many remains of ancient sculpture, as are to be found in Benevento. Scarcely a wall is built of any thing but altars, tombs, columns, and remains of entablatures. The most considerable are in the upper town, supposed by Swinburne (Travels in the two Sicilies, vol. ii. p. 336.) to be the site of the old one.

The cathedral is a clumsy edifice, in a style of Gothic, or rather Lombard, architecture. This church, dedicated to the Virgin Mary, was built in the sixth century, enlarged in the eleventh, and altered considerably in the thirteenth, when archbishop Roger adorned it with a new front. In the court stands a small Egyptian obelisk, of red granite, crowded with hieroglyphics. In the adjoining square, are a fountain, and a very indifferent statue of Benedict XIII., long archbishop of Benevento.

The writers of the Benedictine history fix its origin in the years immediately succeeding the Trojan war, and claim Diomed, the Etolian chief, as its founder. Others assign it to the Samnites, who made it one of their chief towns, whither they frequently resorted for refuge, when worsted by the Romans. In their time, its name was "Maleventum," of uncertain etymology, but after the conquest of Samnium, changed by the Romans into "Beneventum," in order to introduce their colony under fortunate auspices. Near this place,

place, in the 479th year of Rome, Pyrrhus was defeated by Curius Dentatus. In the war against Hannibal, Beneventum signalized its attachment to Rome, by liberal tenders of succour, and by real services. Its reception of Gracchus after his defeat of Hanno, is extolled by Livy, and from the gratitude of the senate, many solid advantages accrued to the Beneventines. However, it shared the devastations of the Roman empire, attending the irruption of the northern nations. When the Lombards invaded Italy, they fixed the seat of their empire at Pavia, and sent a detachment to take possession of the southern provinces. In 571, Zotto was appointed duke of Benevento, as a feudatory to the king of Lombardy, and seems to have confined his government to the city alone, from which he occasionally sallied forth to seek for booty. The second duke, called Arechis, conquered almost the whole country that now constitutes the kingdom of Naples. Upon the fall of Desiderius, last king of the Lombards, the state of Benevento was not materially affected. Arechis the second kept possession, and availing himself of this favourable conjecture, asserted his independence; threw off all feudal submission; assumed the title of prince; and coined money with his own image upon it; a prerogative exercised by none of his predecessors, as dukes of Benevento. Afterwards, when Radelchis and Siconulph aspired to the principality, each of them invited the Saracens to his aid. For the termination of these fatal dissensions, the dominions of these competitors were divided into two distinct sovereignties. In 851, Radelchis reigned as prince at Benevento; and his adversary fixed his court, with the same title at Salerno. From this treaty of partition, the ruin of the Lombards became inevitable; and the erection of Capua into a third principality was another destructive operation. From this time the inroads of the Saracens, and the attacks of the eastern and western emperors, together with anarchy and animosity at home, reduced the Lombards to such wretchedness, that they were able to make a very feeble resistance to the Norman arms. Benevento, however, was chiefly governed by its own dukes and sovereigns, till in the year 1053, the emperor Henry III. transferred it conditionally to pope Leo IX. From the year 1054, to this day, the Roman see, with some short interruptions of possession, has exercised temporal dominion over this city. In a plain near the city a bloody battle was fought in 1266, when Charles of Anjou defeated and killed Mainfroy, his competitor for the sovereignty of the two Sicilies. In 1703, this city suffered greatly from an earthquake.

BENEVIS. See Ben *Nevis*.

BENEVOLENCE, in *Ethics*, denotes a hearty desire of the good of mankind, evidencing itself, as ability and opportunity offer, in the chearful and diligent practice of whatever may promote the well-being of all. Some have traced the origin of this affection in self-love: others again in some "instinct" or determination of our nature, antecedent to all reason from interest, which influences us to the love of others, and they have accordingly made it the foundation of universal "virtue:" others ascribe it to the intelligent constitution of human nature, and observe, that it arises not from instinct, but from the natures and necessity of things. Hutcheson's Inquiry concerning Moral Good and Evil, p. 140, &c. Price's Review, &c. chap. iii.

Benevolence of *God*, in *Theology*, denotes his disposition to do good and to communicate happiness. This perfection of the deity has been referred to the class of moral attributes. (See Attributes.) For the illustration and proof of divine benevolence; see Goodness.

Benevolence is used, both in our *Statutes* and *Chronicles*, for a voluntary gratuity given by the subjects to their sovereign, to which each person contributes in proportion to his estate. Stow (Annals. p. 701.) says, that it grew from the days of Edward IV. It may be found also Anno 11, Henry VII. c. 10. yielded to that prince in regard of his great expences in war, and otherwise. (12 Rep. 19.) But as benevolences had been extorted under many succeeding princes, without a real and voluntary consent, it was made an article in the petition of right, (3 Car. I.) that no man shall be compelled to yield any gift, loan, or benevolence, &c. without common consent by act of parliament.

Nevertheless, by act of parliament, (13 Car. 2. c. 4.) it was given to his majesty king Charles II. with a proviso that it should not be drawn into future example. It was, therefore, declared by the statute 1 W. & M. st. 2. c. 2. that levying money for or to the use of the crown, by pretence of prerogative, without grant of parliament; or for longer time, or in other manner, than the same is or shall be granted, is illegal. See Aid and Tax.

In this sense, benevolence amounts to much the same with what in other nations is called "subsidium charitativum," given sometimes by tenants to their lords, by the clergy to their bishops, &c.—In France it is called *free gift*, excepting that this latter is restrained to the act of the clergy.

BENEVOLENT *Affections*, in *Ethics*. See Affection.

BENEVOLENTIA *Regis Habenda*, in *Law*, the form of purchasing the king's pardon and favour, in ancient fines and submissions, to be restored to estate, title, or place. Paroch. Antiq. p. 72.

BENEVOLI, Orazio, in *Biography*, maestro di capella to the pope in 1650, and extremely applauded by his contemporaries for *poliphonic* compositions. Antonio Liberati, his disciple, in a letter which he published at Rome in 1684, in which he characterises all the eminent contrapuntists of that school, speaking of Benevoli, says: that he surpassed all the masters of his time in writing for four and even six choirs, in which, by the construction and order of the parts, the imitations of beautiful passages, inverted fugues, double counterpoint, new contrivances, ligatures, preparations and resolutions of discords, the texture, connection, and fluidity of the whole, which, like a river, *crescit eundo*; in short, with the wonderful richness and beauty of his harmony, he so completely vanquished envy herself, as to obtain the applause of great masters, while he excited no other wish in the rest, than to imitate his powers in the management of ecclesiastical harmony; by uniting numerous choruses, without dulness, confusion, or breach of rule. He was many years maestro di capella of the Basilica of St. Peter at Rome, and composed his famous mass for six choirs of four parts each, for that cathedral, on the cessation of the plague. It was performed by a band of more than 200 singers, arranged in different circles of the duomo, the sixth choir occupying the summit of the cupola. Besides this mass in 24 parts, there is extant a motet by the same author, for twelve sopranos, or treble voices of equal extent. There can be little melody in any of these multiplied parts; but to make them move at all, without violation of rule, requires great meditation and experience. No author of poliphonic compositions, perhaps, ever equalled Benevoli in this kind of science, except the Netherlander, Okenhem, the master of Jusquin, and our countrymen Tallis and Bull, of whose faculties and invincible patience in such atchievements, there will be further occasion to speak elsewhere. The effect of such multiplied parts can so seldom be tried, that it seems an experiment which never can be fairly made, and is only amusing to the imagination. If there had been more frequent rehearsals of the *miserere* in eight

eight real parts by Leo, which Anfani had performed in 1781 at the Pantheon by more than forty voices, it may be fuppofed, from fuch movements as were correctly executed, that the effect of the whole would have been wonderful! but Leo lived in a more polifhed age, and was gifted, not only with patience, but with tafte and genius.

BENFE', in *Geography*, a fmall ifland of Africa, on the river Sierra Leona, where the Englifh had formerly a factory and a fmall fort, which was taken by the French in 1704, and razed to the ground.

BENFIELD, or Benfelden, a town of France, and principal place of a canton, in the diftrict of Barr, and in the department of the Lower Rhine, feated on the Ill; 4½ leagues fouth of Strafburg. The place contains 1220, and the canton 10,240 inhabitants; the territory includes 180 kilometres and 15 communes. N. lat. 48° 14'. E. long. 7° 45'.

BENFIOL, a mountain of Scotland, in the ifland of Coll.

BENG, a name given among the Mahomedans to the leaves of hemp formed into pills or conferve; the ufe of which, as well as opium, the more rigid Muffulmen efteem to be unlawful, though not mentioned in the Koran, becaufe they intoxicate and difturb the underftanding, as wine does, and in a more extraordinary manner. Thefe drugs, however, are now commonly taken in the Eaft; but thofe who are addicted to them are generally regarded as debauchees.

BENGAL, in *Geography*, the moft eaftern province of the empire of Hindoftan, lying on each fide of the Ganges, and bounded by Afam, Bootan, and Bahar on the north, by Bahar, Berar, and Orifla on the weft, by Orifla and the bay of Bengal on the fouth, and by the mountains that feparate it from Caffay, Aracan, and the Birman dominions on the eaft and fouth-eaft. It extends from about 21° 30', to about 26° 40' N. lat.; and from about 86°, to about 92° 30' E. long. but its boundaries are not accurately afcertained. About 50 miles beyond Tacriagully, which is the termination of a ftupendous range of mountains, that accompanies the courfe of the Ganges from the weft, thefe mountains begin to form the northern boundary of Bengal on the weftern fide of the Ganges; and from hence another range of mountains ftrikes from the fouth, but in a curve fwelling weftward, which terminates within fight of the fea, about 30 miles from Ballafore. To the north thofe mountains divide Bengal from the fouthern divifion of Bahar; and to the fouth they feem to be the natural feparation of Bengal from Orifla. Eaftward the province of Bengal extends as far as Rangamatty, a town belonging to the king of Afam, and feated on the river Burrampooter. The fea-coaft of Bengal, between the mouth of the river Hoogly and that of the Ganges, extends from eaft to weft 180 miles; and the whole is a dreary inhofpitable fhore, which fands and whirlpools render inacceffible to fhips of burden. For feveral miles within land the country is interfected by numerous channels, through which both rivers difembogue themfelves, by many mouths, into the ocean; and the iflands formed by thefe channels are covered with thickets, and occupied chiefly by beafts of prey. According to Acbar's divifion, Bengal is one of the eleven foubahs, or provinces, of Hindoftan proper; and its government extended to Cattack or Cuttack, and along the river Mahanuddy, as the foubah of Orifla appears not to have been formed at that time. The Britifh nation poffefs, in full fovereignty, the whole foubah of Bengal, the greateft part of Bahar, and certain diftricts of Orifla, comprehending 149,217 fquare Britifh miles, and, with the addition of Benares, 162,000 fquare miles, or 30,000 more than are contained in Great Britain and Ireland; and the number of inhabitants has been eftimated at nearly eleven millions. But by fome later computations the number has been found to be much more confiderable. From actual furveys in different diftricts, in which the land occupied in tillage has been diftinguifhed, from that occupied by water or wafte, and for which latter an allowance has been made of one-fourth of the whole furface, it appears, that the uncultivated land in Bengal amounts to about 31,331,499 acres; and that thefe cultivated acres require 5,265,432 tenants; adding to thefe the artificers and manufacturers, in the proportion of about 11 to 40, we fhall have 6,718,514 heads of families, at five perfons each; whence the whole number of inhabitants will be 33,590,770. By other eftimates the population has been computed at more than 30 millions. If to thefe be added about 18 or 20 millions for the population of the Britifh poffeffions in the Myfore and Carnatic, the dominions of the Eaft India Company, will contain a number amounting, probably, to not lefs than 50 millions. With a due encouragement of induftry, the prefent population is thought fufficient to bring into tillage the whole of the wafte lands of Bengal and Bahar. The country of Bengal, independent of Bahar and Orifla, is fomewhat larger than Great Britain. The revenue of Bengal is rated in the Ayin Acbaree, towards the clofe of the 16th century, at 149½ lacks of rupees; under Aurungzebe it is ftated by Mr. Frafer, in his "Life of Nadir Shah," at 131 lacks; in Sujah Cawn's nabobfhip, A. D. 1727, it amounted to 142½ lacks; in 1778 to 197 lacks, net revenue. The total revenue of Bengal, Bahar, Orifla, and Benares, belonging to Great Britain, together with the fubfidy from the nabob of Oude, is computed by Mr. Rennell at 4,210,000*l.* fterling; the expence of collection, military and civil charges, &c. amounts to 2,540,000*l.*; whence he infers that the clear revenue is 1,670,000*l.* The natural fituation of Bengal is fingularly happy with refpect to fecurity from the attacks of foreign enemies. On the north and eaft it has no warlike neighbours; but it is guarded by a formidable barrier of mountains, rivers, or extenfive wattes, towards thofe quarters, if fuch an enemy fhould ftart up. On the fouth is a fea-coaft guarded by fhallows and impenetrable woods, and with only one port, and even that of difficult accefs, in an extent of 300 miles. It is only on the weft that any enemy is to be apprehended; and even there the natural barrier is ftrong; and with its population and refources, aided by the ufual proportion of Britifh troops, in addition to the Sepoy eftablifhment, Bengal might bid defiance to all that part of Hindoftan, which might be difpofed to become its enemy.

The Englifh eftablifhed a commercial intercourfe with this country at an early period; and the Englifh Eaft India company (fee Company) made a fettlement on the river Ganges, in the kingdom of Bengal, probably in the former part of the 17th century. Their firft factory in that kingdom was at the town of Hoogly, on a river of the fame name, about 26 miles above Calcutta. About the year 1689, the company, for their greater convenience, removed to Calcutta, on the fame river, where they built the fort, named Fort William, which they ftill poffefs. Their fort and garrifon were defigned for the protection of their veffels that came down from Patna, laden with piece-goods, raw filk, and faltpetre, which were the principal ftaple commodities of Bengal; otherwife the rajahs, whofe dominions lay on that river, and who were either tributaries to, or powerful governors under, the Mogul, were apt to make, and fometimes did actually make, arbitrary demands of duties for paffing that way. However, it was in the reign of Ferokfere, great-grandfon of Aurungzebe, who was depofed in 1717, that the Englifh Eaft India company obtained the famous "firman," or grant, by which their

their goods of export or import were exempted from duties or customs; and this was regarded as the company's commercial charter in India, while they stood in need of protection from the princes of the country. In the years 1742 and 1743, Bengal was invaded by both the Mahratta states, with armies consisting, as it is said, of 80,000 horsemen each; nor did they depart out of the provinces until the year 1744, when they had collected a vast mass of plunder, and had established the claim of the "Chout," or a fourth part of the net revenues of the provinces, as this proportion was called in the language of Hindoostan. In 1753, the Berar Mahrattas obtained possession of the province of Orissa, partly by conquest and partly by cession from Aliverdy, the nabob of Bengal; and their proximity to Bengal, from which they were separated only by a shallow river, afforded them frequent opportunities of plundering its frontier provinces; and it was not till the year 1761, when Cossim Ally, nabob of Bengal, ceded the provinces of Burdwan and Midnapour to the English, that the Mahrattas ceased to plunder them. In 1756, Aliverdy Cawn, nabob of Bengal, was succeeded by his grandson Surajah Dowlah, who, pretending to be irritated at the conduct of the English within his dominions and really jealous of the rising power of Europeans in general, in other parts of India, determined to expel the English from Bengal, and accordingly took their fort at Calcutta, the chief British settlement in the province, upon which their trade depended, and compelled those among them, who were not made prisoners, to retire, and others he caused to perish by confining them in a small chamber called the "black-hole" of Calcutta. In the following year, however, an armament from Madras, under admiral Watson and colonel Clive, not only recovered Calcutta, but brought the nabob to terms. With a view to permanent security for the future, they negotiated with Jaffier Ally Cawn, an omrah in high trust and favour with the nabob; and he engaged, on condition of their assisting him in his views towards the throne, to be their future ally and confederate. The famous battle of Plassey, fought in June 1757, and in which Jaffier aided the accomplishment of their wishes, by remaining neuter, laid the foundation of the future power of the British nation, not only in Bengal, but in Hindoostan. From that time they became the arbiters of the succession of the nabobship of Bengal, which speedily led to the possession of the powers of government; for Cossim Ally, who had been placed in the room of Jaffier, disliking his situation, resolved at all events to hazard a change. This brought on a war, which terminated in the expulsion of Cossim, and left the Bengal provinces in the possession of the English, who restored Jaffier to the nabobship. Lord Clive, assuming the government of Bengal in 1765, seized the opportunity, afforded by the recent death of nabob Jaffier Ally, of taking possession of the Bengal provinces; and obtained from the nominal Mogul, Shah Aulum, a grant of the duanny, or administration of the revenues of Bengal, Bahar, and Orissa; on condition of paying the Mogul 26 lacks of rupees (260,000*l.*) *per annum* Thus a territory producing at that time at least a million sterling *per annum*, after every expence was defrayed, and containing at least ten millions of inhabitants, was gained to the company, on the side of Bengal; together with the northern circars, valued at near half a million more, and for which a grant was also obtained. The Bengal provinces, which have been in our actual possession from the year 1765, have, during that whole period, enjoyed a greater share of tranquillity than any other part of India; or indeed, than those provinces had ever experienced since the days of Aurungzebe. Previous to the establishment of our influence, invasions were frequent, particularly by the Mahrattas, and one province or other was ever in rebellion; owing to a want of energy in the ruling power, an ill-paid and mutinous army, and an excess of delegated power.

The government of Bengal, and its extensive dependencies, was first vested in a governor-general and a supreme council, consisting of a president and eleven counsellors; but in 1773, these were restricted to four, with Warren Hastings, the governor-general, who were to direct all affairs, civil and military, in the provinces of Bengal, Bahar, and Orissa; and to control the inferior governments of Madras on the east, and Bombay on the west, with Bencoolen, in the island of Sumatra. The court of judicature consists of a chief justice, and three other judges, with civil, criminal, naval, and ecclesiastical jurisdiction. The Hindoos are governed by their own laws, nor would it be easy, if practicable, to extinguish the influence of the Brahmins, or totally to abolish the casts, to whatever degree they may countenance and maintain fanaticism and superstition. The military establishment in Bengal is always respectable, but varies according to the situation of affairs. The British troops are supported by the Sepoys, a native militia, who are accustomed to have numerous idle followers, so that the effective men seldom constitute more than a quarter of the nominal army. A force of 20,000 British soldiers might probably encounter and vanquish 200,000 blacks or Hindoos. The decisive battle of Plassey, which secured to us the possession of these opulent provinces, was gained with an army of about 3000 men, of whom 900 only were Europeans; and at the battle of Buxar, in 1764, the whole number of combatants on the side of the British did not exceed 7000, and of these 1200 only might be Europeans.

The climate of Bengal is reckoned by Dr. Lind, in his "Essay on diseases incident to Europeans in hot climates, &c." the most insalubrious and fatal to Europeans of any of the British settlements in India, that of Bencoolen excepted. This is owing partly to the heat of the air, and more especially to that of the land wind, which, passing over a tract of country much heated by the season, and consisting in various districts of extensive sandy deserts, becomes so hot and suffocating that it can scarcely be endured. These hot winds, occasionally loaded with sand, are so pernicious, particularly to persons exposed to them whilst sleeping, that they produce a kind of paralytic distemper, called the "barbiers," which is attended with a total loss of the use of the limbs, and for which no relief can be obtained but by removing to some other climate. But the unhealthiness of this climate is principally owing to the inundations of its rivers, and to its level or flat surface, so that the waters stagnate; and of course when, in the month of October, the stagnated waters begin to be exhaled by the heat of the sun, the air is greatly polluted by the vapours that arise from the slime and mud that are cast by the rivers, and by the putrefaction of dead fish, and other animals. Although the salubrity of the climate of Bengal has been considerably improved by clearing the country of trees and jungle, by canals, and by draining the marshes, yet fogs are at this time common, very thick and very unhealthy; and excessive fogs also prevail at other seasons, and they often occur in the months of January and February. In Bengal, the hot, or dry season, begins with March, and continues to the end of May, the thermometer sometimes rising to 110°; and this intense heat is occasionally interrupted by violent thunderstorms from the north-west. The rainy season continues from June to September or October; but the three last months of the year are generally pleasant. The cold season commences in November, and lasts till the beginning of February; northerly winds are then prevalent, and the mornings, especially before sun-rise, are cold. It is also frequently very

foggy, but about 8 or 9 o'clock, when the ſun begins to be powerful, the thick miſt is diſſipated. For the remainder of the day the ſky is perfectly clear, ſo that no clouds appear in the air for ſeveral days together. In the months of September and October diſeaſes rage, and chiefly attack thoſe that are lately arrived; but here, as in all other places, ſickneſs is more frequent and fatal in ſome years than in others. The moſt prevalent diſtempers are fevers, of the remitting or intermitting kind; for though ſometimes they may continue for ſeveral days without any perceptible remiſſion, yet they have in general a great tendency to it, and are commonly accompanied with violent paroxyſms of rigours or ſhiverings, and with diſcharges of bile upwards and downwards. If the ſeaſon be very ſickly, ſome are ſeized with a malignant fever, of which they ſoon die. The body is covered with blotches of a livid colour, and the corpſe in a few hours becomes quite black and corrupted. At this time fluxes prevail, which may be called bilious, or putrid, the better to diſtinguiſh them from others, which are accompanied with an inflammation of the bowels. In all theſe diſeaſes at Bengal, the lancet is cautiouſly to be uſed. The mode of treating fevers and bilious complaints being now well underſtood, they are leſs alarming and fatal. Dr. Lind ſays it is a common obſervation, both at Bengal and Bencoolen, that the moon or tides have a remarkable influence on intermitting fevers; and he informs us, on the teſtimony of a gentleman of undoubted veracity, and of great knowledge in medicine, that at Bengal he could foretel the preciſe time when the patient would expire; it being generally about the hour of low water. From theſe and other obſervations, the doctor deduces an uſeful hint, which is, to take doſes of bark at the full and change of the moon, as being the ſeaſons moſt liable to an attack or relapſe in theſe intermitting fevers.

Although the rainy ſeaſon does not commence in the flat countries of Bengal till the latter end of the month of June, the Ganges and other rivers begin to ſwell in the mountains of Thibet early in April, and by the latter end of that month, when the rain-water has reached Bengal, the rivers riſe here. This circumſtance is accounted for partly by the melting of the ſnow on the mountains, but principally, as Mr. Rennell obſerves, by the vaſt collection of vapours wafted from the ſea by the ſoutherly or ſouth-weſt monſoon, and ſuddenly ſtopped by the lofty ridge of mountains that runs from eaſt to weſt through Thibet. Hence it appears that the rainy ſeaſon muſt commence ſooner in places that lie near the mountains than in thoſe that are more remote. In Bengal the rivers riſe by ſlow degrees; the increaſe being only about an inch per day for the firſt fortnight. It then gradually augments to two and three inches, before any quantity of rain falls in the flat countries; and when the rain becomes general, the mean increaſe is about five inches per day. By the latter end of July, all the lower parts of Bengal, contiguous to the Ganges and Burrampooter, are overflowed, and form an inundation more than 100 miles wide; nothing appearing but villages and trees, excepting, very rarely, the top of an elevated ſpot, the artificial mound of ſome deſerted village, appearing like an iſland. The inundations in Bengal are as much occaſioned by the rain that falls there, as by the waters of the Ganges; in proof of which it is alleged, that the lands in general are overflowed to a conſiderable height long before the bed of the river is filled. It ought to be obſerved, that the ground adjacent to the bank of the river, to the extent of ſome miles, is higher than that which is at a greater diſtance; and thus it ſerves to ſeparate the waters of the inundation from thoſe of the river, until it overflows. This high ground is, in ſome ſeaſons, covered a foot or more; but the height of the inundation within varies, of courſe, according to the irregularities of the ground; and is in ſome places 12 feet. When the inundation becomes general, the river appears, as well by the graſs and reeds on its banks, as by its rapid and muddy ſtream; for the water of the inundation acquires a blackiſh hue, by remaining long ſtagnant among graſs and other vegetables; nor does it ever loſe this tinge, which ſhews the predominancy of the rain water over that of the river; and the ſlow rate of the motion of the inundation, which does not exceed half a mile per hour, indicates the remarkable flatneſs of the country.

In order to guard thoſe tracts of land, which, by the nature of their culture and productions, and by the lowneſs of their ſituation, would be injured by too long an inundation, dikes or dams are raiſed at an enormous expence, extending in the whole of their length to more than a thouſand Engliſh miles. Some of theſe are at the baſe equal to the thickneſs of an ordinary rampart, and yet, on account of the want of tenacity in the ſoil of which they are compoſed, they are often found ineffectual, and need frequent repairs. One particular branch of the Ganges, navigable only during the rainy ſeaſon, and then equal to the Thames at Chelſea, is conducted between two of theſe dykes, through an interval of 70 miles; and when it is full, the paſſengers in the boats look down, as from an eminence, on the adjacent country. During the ſwoln ſtate of the river, the tide becomes incapable of counteracting the ſtream, and in a great meaſure of ebbing and flowing, except near the ſea. At ſuch a ſeaſon, a ſtrong wind, that blows up the river for any continuance, ſwells the waters two feet above their ordinary level; and ſuch accidents have occaſioned the loſs of whole crops of rice. This rice is of a particular kind, for the growth of its ſtalk keeps pace with the increaſe of the flood at ordinary times, but is deſtroyed by too ſudden a riſe of the water. The harveſt is often reaped in boats. There is alſo a kind of graſs which overtops the flood in the ſame manner, and at a ſmall diſtance has the appearance of a field of the richeſt verdure. Mr. Rennell informs us, that in the year 1763, a tragical event happened at Luckipour, about 50 miles from the ſea, by a ſtrong gale of wind, conſpiring with a high ſpring-tide, at a ſeaſon when the periodical flood was within 1½ foot of its higheſt pitch. The waters then roſe 6 feet above the ordinary level. On this occaſion the inhabitants of a conſiderable diſtrict, with their houſes and cattle, were totally ſwept away; and the calamity was aggravated by its happening in a part of the country which ſcarcely produces a ſingle tree, to which a drowning man might eſcape. Theſe inundations are traverſed by every kind of embarkation; ſuch as are bound upwards taking advantage of a direct courſe and ſtill water, at a ſeaſon when every ſtream ruſhes like a torrent. The wind too, which at this ſeaſon blows regularly from the ſouth-eaſt, although in the gulf or bay of Bengal the monſoon blows from the S.S.W. and S.W., favours their progreſs in the eaſtern and northern parts of Bengal, where it blows from the S.E. or E.S.E.; ſo that a voyage which would take up nine or ten days by the courſe of the river, when confined within its banks, may be performed in ſix days. Huſbandry and grazing are at this time both ſuſpended; and the peaſant traverſes in his boat thoſe fields which, in another ſeaſon, he was uſed to plough; happy, however, that the elevated ſite of the river-banks places within his reach the herbage which they afford; without which his cattle muſt periſh. Towards the middle of Auguſt, the inundation begins to ſubſide; for though great quantities of rain fall in the flat countries in Auguſt and September, yet, by a partial ceſſation of the rains in the mountains, the ſupplies fail that are neceſſary to keep up the inundation. However, the decreaſe of the inundation does not

not always keep pace with that of the river, on account of the height of the banks; but after the beginning of October, when the rain has nearly ceased, the remaining inundation goes off quickly by evaporation; and the lands are left highly manured, and in a state fit for receiving the seed, after the simple operation of ploughing. For an account of the "bore," to which the rivers of Bengal are subject; see the article BORE.

From the time of the change of the monsoon in October, to the middle of March, the rivers are in a tranquil state; and then the "north-westers" begin in the eastern parts of Bengal, and later as we advance westwards: and they may be expected once in three or four days, until the commencement of the rainy season. These "north-westers," so called from the quarter in which they usually originate, are the most formidable enemies to the inland navigation of Bengal. They are sudden and violent squalls of wind, and though they are of no long duration, they are often attended with fatal effects, and have caused whole fleets of trading boats to sink almost instantaneously. They are more frequent in the eastern than in the western part of Bengal; and happen oftener towards the close of the day than at any other time. For some hours before they arrive, they are indicated by the rising and singular appearance of the clouds; and thus the traveller is warned to seek shelter. But in the great rivers they are truly formidable; more especially about the latter end of May, and beginning of June, when the rivers are much increased in width. After the commencement of the rainy season, which period varies, in different parts, from the middle to the end of June, tempestuous weather must be occasionally expected; but at this season places of shelter are more common by the filling of the creeks and inlets, as the river increases, and, on the other hand, the bad weather is of longer continuance, than during the season of the "north-westers." The inland navigation of Bengal is performed with safety, with respect to the weather, during the long interval between the end of the rainy season, and the beginning of the "north-westers." At this latter season peculiar attention and care are necessary. For an account of the boats that are used in this inland navigation, see BUDGE-ROW.

Bengal is a low flat country, fertilized by numerous rivers and streams, and interspersed with a few ranges of hills. The triangle formed by the Cossimbazar and Hoogly rivers to the west, by the Ganges to the east, and by the sea-coast to the south, as well as a large tract on each hand to the north of this Delta (see DELTA), is as level as the lower Egypt. Such parts of this extensive plain as are not watered by the Ganges or its branches, are fertilized by many other streams from the mountains; and for the space of three months, when the sun is mostly vertical, heavy rains fall every day. The periodical rains and intense heats produce a luxuriance of vegetation, almost unknown to any other country in the globe; and therefore Aurungzebe emphatically denominated Bengal "the paradise of nations;" and it has been peculiarly styled "the paradise of India." The soil is a stratum of black vegetable mould, rich and loamy, extending to the depth of six feet, and in some places fourteen, and even twenty feet, lying on a deep sand, and interspersed with shells and rotten wood, which indicate the land to have been overflowed, and to have been formed by materials deposited by the rivers. It is easily cultivated without manure, and bad harvests seldom occur. In this country they have two harvests; one in April, called the "little harvest," which consists of the smaller grain; and the second, called the "grand harvest," is only of rice. The chief grain is rice, on which the natives chiefly subsist, and which is exported from hence into other countries. Bengal produces also very good wheat; and it furnishes the inhabitants of the mountains of Cassmere, and of the elevated plains of Thibet, with both rice and wheat, in return for their shawls, gold, and musk. Upon the failure of their crop of rice, a grievous famine ensues. Of this many melancholy instances have occurred, both in Bengal and in other parts of India. One of the most deplorable of this kind occurred in the year 1770. On this occasion, the nabob, and great men of the country, distributed rice gratis to the poor; but when their own stocks began to fail, they withdrew their donations, and Calcutta was crowded with multitudes of persons who came thither to solicit relief. But the whole stock being expended, the famine prevailed, and many thousands fell down as victims to hunger in the streets and fields; so that their bodies, mangled by dogs and vultures, corrupted the air, and seemed to threaten a plague. Many persons were employed daily, on the company's account, in throwing dead carcases into the river, so that the waters were contaminated, and the fish could not be eaten without danger. Hogs, ducks, and geese, fed chiefly on the dead bodies; and the only meat which could be procured was mutton, which, on account of the dryness of the season, was so small, that a quarter of it would scarcely weigh a pound and a half. This dreadful famine was occasioned by a preternatural drought, which caused both the great harvest of 1769, and the little one of 1770, to fail. As a preservative from the miseries attending a dry season, and as a source of supply of water for domestic purposes, the inhabited part of the country is furnished with numerous reservoirs of an oblong square shape, and of various sizes, frequently more than an acre in extent, dug in the earth, and called "tanks." These are filled with water in the rainy season, and afford the inhabitants, during the dry months, a supply of water of a better quality and appearance than that of the Ganges, which is always thick and muddy. In these tanks is bred a sort of fish, in taste resembling our carp. Among the other vegetable productions of Bengal, the most important of which are tobacco, sugar, indigo, cotton, mulberry, and poppy, we may enumerate the banian tree, the cocoa-nut palm, which supplies a manufacture of cordage, called "coir," (see COIR), guavas, plantains, pomelos, potatoes, lime trees, and orange trees. They have also the pisang, or banana; the suri tree, which affords, by incision of the stem, a clear and sweet juice, of an intoxicating quality, and when turned sour is used as vinegar; and the mango tree, the fruit of which is preferred to all others in the country, except very fine pine apples, and which is much used in the hot months. Mr. Ives (Voyage from India to England, &c. 4to. 1773.) mentions a beautiful tree, called "chulta," which has a flower that is at first a hard green ball, on footstalks about four inches long. When this opens, the calyx appears to be composed of five round, thick, and succulent leaves, and the corolla of the same number of fine beautiful white petals. After one day the corolla falls off, and the ball closes again; of these there is a succession for several months. In the walks of Bengal they have a tall tree, called the "tatoon;" and near Calcutta a spreading tree, called the "russa," making a fine appearance when in full bloom. In their gardens they cultivate most of the vegetables that are natives of other climates, and fit for culinary purposes. Among the animals of Bengal, we might mention the elephant, tiger, wild buffaloes, jackals, dogs, snakes, scorpions, &c. and a kind of birds, named "argill," or "hurgill," a species of ARDEA, which are very large and ravenous, and held in great veneration by the Brahmins. Game, poultry, fish, and water-fowl of all kinds, are very plentiful in Bengal. The horses used by the Europeans in this province are either of Persian or Arabian ex-

traction,

tration, and consequently fell at a high price. The native horse of Bengal is thin, ill-shaped, and contemptible, and even in its best shape never equals the Welsh or Highland poney, either in figure or usefulness. The cattle principally used for the team in Bengal are bullocks; and the most common vehicle among the peasants is a HACKERY; which see. but Bengal is more defective in its breed of cattle than most other parts of India. The size of its sheep is small; their figure lank and thin; and the colour of three-fourths of a flock is black or dark grey. The quality of a fleece of wool in this country is worse, if possible, than its colour; as it is remarkably harsh, thin, and hairy.

The inland commerce of Bengal is very considerable; and it is carried on by means of those rivers and canals that intersect the country, and along the banks of which are many towns and villages, with pleasant fields of arable and pasture land, which diversifies the face of the country, and renders it very beautiful. Some of the canals, formed either by the hands of men, or by the operations of nature, are wide and deep enough to be navigated by large ships. One of the most considerable of these is the "Haze," or "Hare" channel, that runs straight through the country into the arm of the river that flows by Dacca. The chief articles of commerce which the country yields are silk, muslin, calicoes, cotton, and other piece-goods; opium, saltpetre, gum-lac, and indigo. Rice, wheat, &c. can only be reckoned casual branches of trade. Bengal has an inland trade with Thibet, which it supplies with cottons, besides some wine and cloths of European manufacture, receiving in exchange musk and rhubarb; and a much more extensive commerce with Agra, Delhi, and their adjacent provinces, in salt, sugar, opium, silk, silk-stuffs, and an immense quantity of cottons and muslins. The maritime trade of Bengal, managed by the natives of the country, has been divided into two branches, *viz.* that of Cattack by means of its port Balasore with the Maldives, whither they transmit rice, coarse cottons, and fine silk stuffs, and where they receive in exchange cowries, used for money at Bengal, and sold to the Europeans. The inhabitants of Cattack also carry on a considerable trade with the country of Asam, which they supply with salt in great quantities, receiving in payment a small quantity of gold and silver, ivory, musk, eagle-wood, gum-lac, and a large quantity of silk. A more considerable branch of trade, which the Europeans carry on with the rest of India, is that of opium, which is cultivated at Patna. The Dutch send rice and sugar to the coast of Coromandel, for which they are usually paid in specie. They have also formerly supplied Ceylon with rice, Malabar with cottons, and Surat with silk; whence they brought back cotton, usually employed in the coarse manufacture of Bengal. Some ships laden with rice, gum-lac, and cotton stuffs, are sent to Bassora; and return with dried fruits, rose-water, and gold. The rich merchandise carried to Arabia is paid for entirely in gold and silver.

The articles that are disposed of to advantage in Bengal, are all kinds of spices, japan copper, sandal wood, and japan wood, and also tin, lead, pewter, and other European commodities, of various kinds. See EAST INDIA COMPANY, and CALCUTTA.

Bengal is peopled by various nations, but the principal are the Moguls, or Moors, and the Gentoos, Hindoos, or Bengalese, and both the Bengalese and Moors have each a distinct language.

The Moguls, or Moors, are descendants of those who between two and three centuries ago reduced this kingdom, and the whole empire of Hindostan, under their dominion. They were originally natives of Tartary. They nearly resemble the Europeans in traits and features; but differ more or less from them in colour. The Moguls are olive, though, in the Indian language, Mogul signifies white. The women are very handsome, and much use bathing; like the men, they are of an olive colour, and different in form from the women of Europe. Their legs and thighs are long, and their bodies short. According to Thevenot, the Mogul women are chaste, very fruitful, and bring forth with so much ease, that they frequently walk the streets the very next day after delivery. Stavorinus says, that their morals are infamously bad, and that they are addicted to the most unnatural vices. The Moguls are more courageous than the Bengalese; and their "Sipahis" form good soldiers, when they are trained and commanded by European officers. Their religion is that of Mahomet; and consequently they hold in abhorrence the idolatry of the Gentoos.

The Bengalese, who are much more numerous than the Moors, do not differ much from the Europeans in stature; their colour is dark brown; the complexion of some of them approaches to yellow; their hair black and uncurled; and they are generally handsome and well made. They are indolent, lascivious, and pusillanimous; and nothing but hunger or thirst rouses their activity. Some of them, however, are intelligent and ingenious; and though most of them are poor, some of their banyans, or merchants, are very wealthy, and very expert in matters of trade. Their women are said to be uncommonly wanton and intriguing; prostitution is not thought by them a disgrace; and they have licensed places, in which the law allows them, under a certain assessment, to distribute their favours. Their artificers in gold and silver are very ingenious, and imitate any model that is set before them with great exactness. Europeans are often surprised to observe the perfection to which they have arrived in those branches of spinning cotton, and of repairing muslins that are torn, and in almost all the handicraft operations in which they are employed. The common people go almost naked. They wear nothing but a piece of linen, wrapped round the waist, and passed between the legs. Those of a higher rank have a dress of white cotton, which doubles over before as high as the shoulders, and is fastened with strings round the middle, and which hangs down to their feet. Most of them shave their heads, and eradicate the hair from all parts of the body. Rich people wear turbands, and many of them wear small ear-rings. The dress of the women consists of a piece of cotton cloth thrown over the shoulders, under which they wear a kind of coat and drawers. Those who can afford it adorn their hair with gold bodkins, and their arms, legs, and toes with gold and silver rings and bands, and also their ears, and the cartilage of the nose. The inferior women wear similar ornaments, made of a sort of cowries, and called "chanclos." Their heads are bare, and their hair turned up, and fastened at the back of the head. Rice is the chief article of their food, the remainder of which consists of vegetables and milk. They eat no fish, flesh of animals, nor any thing that has had life. Their beverage is pure water.

Both the Moors and Bengalese are fond of the amusement of dancing; and for this purpose they employ young women, who are trained up from their infancy to this diversion, and who are richly decorated whenever they are engaged to perform. Dancing is accompanied with music, both vocal and instrumental. For an account of the other inhabitants of Bengal, see GENTOOS and HINDOOS. See also BRAHMINS and FAQUIRS. Besides these, several of the eastern nations, Persians, Armenians, and others, resort to Bengal, allured by the advantageous trade which they are enabled to pursue there.

Four European nations have established themselves in Ben-

gal for the purpose of commerce, *viz.* the English, the Dutch, the French, and the Danes. The English are the principal, and their chief settlement is at Calcutta, the present capital of the country. (See CALCUTTA.) Europeans lead, in Bengal, a very easy life. The men, who are almost all in the service of the company, devote a part of the morning to business, and persons of fortune keep in daily employment a black writer, for which he receives 20 or 25 rupees per month. They spend the remainder of their time in personal improvement or recreation. Besides the black writers, most Europeans have also one or two banyans, who note down all payments and receipts, and who adjust all pecuniary matters in buying and selling. Moorish domestics are kept for the menial services of the house, and "peons," to run before the palankeens, and to carry an umbrella, or parasol, over the head of their master, when he goes out; and every house has likewise a porter, whose sole occupation is to answer the door; and one or two sets of "berras," or palankeen-bearers, together with a "harry-maid," or "matarani," who carries out the dirt; and a great number of slaves, both male and female.

The current coins in Bengal, and in the whole extent of Hindostan, are gold and silver RUPEES; which see. See also MOHUR. Copper coin is not seen in Bengal. For change they make use of cowries, 80 of which make a "poni," and 60 or 65 ponis, according to the scarcity or plenty of cowries in the country, make a rupee. However, there is great variation in the value of cowries in Bengal. Weights are calculated by the Sar, answering nearly to two pounds avoirdupoise, of which 40 make a maund; which see. The measures of length are cobidos, and gess or goss, which see. Distances between places are measured by coss. See COSS. The vessels used for inland navigation are burs, budgerows, and pulwhas, which see. The general conveyance of passengers by land is on a sort of litters, called palankeens, which see. For an account of the manners and customs of the inhabitants of Bengal, and various other particulars; see CALCUTTA, HINDOSTAN, and INDIA. See also GENTOOS, HINDOOS, and BRAHMINS.

BENGAL, *bay of*, is a large gulf in the Indian ocean, between the two peninsulas of India; bounded on the north by the coast of the province of Bengal, on the east by the kingdoms of Aracan, Pegu, Siam, the peninsula of Malacca, or Malaya, and part of the island of Sumatra; on the south by the great Indian ocean; and on the west by the coasts of Orissa, Coromandel, and the island of Ceylon. The Ganges and several other rivers, discharge themselves into this gulf; it contains many islands; and it abounds with bays, harbours, and port towns. Its widest extent is about 86 leagues, and its length about 72 leagues. In a more confined view it may be said to begin at cape Palmiras.

BENGAL, *Language of*, or BENGALESE, is derived from the Shanscrit (which see), and distinct from the Persian, Moors, and Hindostannic, which are spoken in several parts of this province, and each of which has its peculiar department in the business of the country. Its alphabet, like that of the Shanscrit, consists of 50 letters, of the form, sound, and arrangement of which Halhed has given a very particular and detailed account in his "Grammar of the Bengal Language," printed at Hoogly in Bengal in 1778. The only impediments in acquiring the knowledge of this language are the great number of letters in its alphabet, the intricate variety of their combinations, and the difficulty of pronunciation; but the grammatical part is simple, though diffuse, and complete without being complex. Its rules are plain, and its anomalies few. The vowels are distributed into long and short, the latter of which are often omitted in writing, and they are invariably subjoined to the consonant with which they are uttered, and never precede them. As every consonant, therefore, inherently possesses the short vowel on which its utterance depends, it is plain that no two consonants could have been joined together, and successively pronounced in the same syllable, but that a vowel must necessarily have intervened. In order to remedy this inconvenience, a set of distinct characters was invented, called "P,holaas," or adjuncts. These are certain subordinate and subsidiary figures, eleven in number, that may be attached to each of the consonants in the alphabet respectively, and thus provide against the too frequent recurrence of the internal vowel. Exclusively of these "P,holaas," almost any two or three consonants may be blended together, for supplying the omission of the internal vowel. The compound letters may be formed by placing one letter immediately under another; or by blending two letters together, so as by their union to make one character; or by making the first of the two consonants much smaller than the other letters, which latter mode is the most common. The genders of this language are three, and the terminations usually distinguishing the masculine are *aa*, and those of the feminine are *ee;* but it is not necessary that every noun comprehending sex should be distinguished by a particular termination, or mode of formation, expressly to denote its gender. The Bengalese has four cases besides the vocative, and in this respect it is much inferior to the Shanscrit, which comprehends eight different cases. The Bengal nouns have neither dual nor plural numbers; and the same form of noun serves for the singular or plural. In compositions of this language, though the first and second persons occur very frequently, the use of the pronoun of the third is very rare; and in order to avoid the application of the words *he* and *they*, the names of persons are repeated in a manner that is very tiresome and disgusting. The second person is always ranked before the first, and the third before the second. The personal pronouns have seven cases, which are very irregularly varied. The indefinite pronouns are all aptotes in Bengalese, as they are in Latin and Greek. The Shanscrit, which is the parent of the Bengalese, as well as the Arabic, Greek, and Latin verbs, are furnished with a set of inflections and terminations, so comprehensive and so complete, that by their mere form they can express all the distinctions both of person and time. By their root they denote a particular act, and by their inflection they express the time when it takes place, and the number of the agents; and thus their separate qualities are perfectly united. Every Shanscrit verb has a form equivalent to the middle voice of the Greek, used through all the tenses with a reflective sense, and the former is the most extensive of the two in its use and office; because in Greek the reflective can only be adopted intransitively when the action of the verb descends to no extraneous subject; but in Shanscrit, the verb is at the same time both reciprocal and transitive. Neither the Shanscrit, nor the Bengalese, nor the Hindostannic, have any word corresponding to the sense of the verb *I have*, and therefore the idea is always expressed by *est mihi;* and of course there is no auxiliary form in the Bengalese verb answering to *I have written*, but the sense is conveyed by another mode. As the verb substantive *to be* in all languages is defective and irregular, it is called in Shanscrit a "semi-verb;" and it is observed, by the ingenious writer above cited, that the present tense of this verb, both in Greek and Latin, and also in the Persian, appears evidently to be derived from the Shanscrit. In the Bengalese, this verb has only two distinctions of time, the present and the past; and the terminations of the several persons of these serve as a model for those of the same tense in all other verbs

verbs respectively. The Bengalese verbs may be distributed into three classes, which are distinguished by their penultimate letter. The simple and most common form has an open consonant immediately preceding the final letter of the infinitive. The second is composed of those words whose final letter is preceded by another vowel or open consonant going before it. The third consists entirely of causals, derived from verbs of the first and second conjugation. The Greek verbs in μι are formed exactly upon the same principle with the Shanscrit conjugations, even in the minutest particular; of which instances occur in many verbs, which form from a root a new verb by adding the syllable *mi*, and doubling the first consonant. In forming the past tense, the Shanscrit applies a syllabic augment, like the Greek; and the future is characterised by a letter analogous to that of the same tense in the Greek, omitting the reduplication of the first consonant. Nor, indeed, is the reduplication of the first consonant always applied to the present tenses of the Shanscrit, any more than to those of the Greek. It is observed, that the natural simplicity and elegance of many of the Asiatic languages are very much debased and corrupted by the continual abuse of auxiliary verbs; and this inconvenience has evidently affected the Persian, the Hindostan, and the Bengal idioms. The infinitives of verbs, in the Shanscrit and Bengalese, are always used as substantive nouns; and a similar mode of signification often occurs in the Greek. In the Shanscrit language, as well as in the Greek, certain forms of infinitives and of participles comprehend time; and there are also other branches of the verb that seem to resemble the gerunds and supines of the Latin. All the terms which serve to qualify, to distinguish or to augment, either "substance" or action," are classed by the Shanscrit grammarians under one head; and the word used to express it literally signifies increase or addition. According to their arrangement, a simple sentence consists of three members, viz. the agent, the action, and the subject: which, in a grammatical sense, are reduced to two, viz. the noun and the verb. They use a particular word for specifying such terms as amplify the noun, which imports quality, and corresponds to our adjectives or epithets. Such as are applied to denote relation or connection, are expressed by another term, which may be translated "preposition." The simple adjectives in Bengalese have no variation of gender, case, or number; neither is the adjective subject to inflection, but the sign of the case is confined to the substantive, with which it agrees; and its form is confined to the singular number, even when joined to a plural noun. But those derivative attributes, which are alternately adjectives and concrete nouns, generally preserve the distinctions of gender, which they all possess in the Shanscrit. Prepositions are substitutes for cases, which could not have been extended to the number necessary for expressing all the several relations and predicaments in which a noun may be found, without occasioning too much embarrassment in the form of a declension; these in the Greek language are too few, and hence results great inconvenience. The Latin, which is less polished than the Greek, bears a nearer resemblance to the Shanscrit, in words, inflections, and terminations.

The Bengalese method of computation, among the merchants, for the largest sums is by "foura;" derived probably from the original mode of numbering by the fingers.

To this day the Bengalese reckon by the joints of their fingers, beginning with the lower joint of the little finger, and proceeding to the thumb, the value of which is also included as a joint; and thus the whole hand contains 15. From this method of performing numeration on the joints, arises that well known custom among the Indian merchants of settling all matters of purchase and sale by joining their hands beneath a cloth, and then touching the different joints, as they would increase or diminish their demand. See BANIANS.

It is peculiarly in the Bengalese computation, that the ninth numeral of every series of ten is not specified by the term of nine, in the common order of progression, but takes its appellation from the series immediately above it, as twenty-nine is not expressed in our manner, or by what we should conceive to be its proper denomination, but by a term denoting one less than thirty.

The Shanscrit language, besides other advantages, has a great variety in the mode of arrangement; and the words are so compacted together, that every sentence appears like one complete word. When two or more words come together "in regimine," the last of them only has the termination of a case; the others are known by their position; and the whole sentence, so connected, forms but one compound word, which is called a "foot."

For further particulars relating to the language of Bengal, its grammatical construction, and the method of acquiring it, we must refer to Halhed, *ubi supra*.

The verses of the Bengalese are regulated by accent, and by the number of syllables in a line; no regard whatever being paid to quantity, but as it coincides with accent. Their poems, like those of the Arabians and Persians, are in rhyme; and the Bengal poets have many rules for contracting such words as are too long, and for extending those that are too short, for their metre. The Bengal measures are altogether borrowed from the Shanscrit, and may be divided into three species; viz. heroic, lyric, and elegiac.

In music, the Bengalese always use the minor key, and their gamut proceeds by the very smallest intervals of the chromatic scale. They have no idea of counterpoint, and always play or sing in unison or octaves.

The natives of Bengal write with a slender and tough reed, very common in all the east, which they shape almost like an European pen. They write with the hand closed, in which they hold the pen as the Chinese do their writing-pencil, pressing it against the ball of the thumb with the tip of the middle finger. The nib or point of the pen is turned downwards towards the wrist; while the thumb pointing upwards, and lying on the pen with its whole length, keeps it firm against the middle joint of the fore-finger. As they have neither chairs nor tables, they sit upon their heels, or sometimes on their hams, whilst they are writing; and their left hand, held open, serves as a desk on which to lay the paper on which they write, which is kept in its place by the thumb.

BENGALENSIS, in *Conchology*, a species of VENUS, described by Lister. The shell is orbicular, somewhat equilateral, with thick perpendicular striæ; and the beaks turned back. Inhabits Bengal.

BENGALENSIS, in *Ornithology*, a species of VULTUR, found in Bengal. It is of a brown colour, with the head and fore-part of the neck bare of feathers, and pale chestnut; bill lead colour, black at the tip. Latham. Gmelin.

BENGALENSIS, a species of OTIS, called by G. Edwards the *Indian Bustard*. The colour is black; space round the eyes brown; back, rump, and tail, shining brown. Gmelin. Inhabits Bengal, and is about twenty-three inches in length. Brisson calls this Pluvialis Benghalensis major; and Buffon, Charge ou outarde moyenne des Indes. The beak and legs are whitish, tail streaked, and spotted with black. Edwards copied this bird from a drawing, and it does not appear that a specimen of it is known in any cabinet.

BENGALENSIS, a species of RALLUS, of a white colour, with the head and neck black; wings and back greenish, primary quill feathers spotted with red. Gmelin. This is the

the Bengal water-rail of Albin; Totanus Bengbalensis of Brisson; and Chevalier vert of Buffon. The bill, irides, and legs are yellow; crown, area of the eyes, lower part of the back and body beneath white, temples and throat black brown; primary quill feathers purple, secondaries green; tail purple, with fulvous spots.

BENGALLA, in *Geography*, a city of Hindostan, which existed during the early part of the 17th century, near the eastern mouth of the Ganges, but of which no traces now remain.

BENGASI, or BERNICHE, a sea-port town on the coast of Africa, in the Mediterranean. The merchants of this place usually join the caravan from Cairo at Augela in their way to Mourzouk, the capital of Fezzan, and import tobacco, manufactured for chewing, and snuff, and sundry wares fabricated in Turkey. N. lat. 32° 10′. E. long. 20°. This town is said to be the ancient Berenice, built by Ptolemy Philadelphus.

BENGEVAI, a town of Persia, in the province of Segestan, 75 miles south of Zareng.

BENGHUR, a town of Persia, in the province of Cabul; 32 miles north of Cabul.

BENGLO, a mountain of Scotland, in the county of Perth, the highest point of which is said to be 3724 feet above the level of the sea; 5 miles N. E. of Blair Athol.

BENGO, or BENGA, a province of the kingdom of Angola in Africa, situate along the river of its name, but more commonly known by that of Zenza. It has the sea on the west, and the province of Moseche on the east. The Portuguese have cultivated large tracts of land in this province, which now abounds with maize and manioc root, with which they make their bread. It produces also plenty of banana and bacova trees. It is divided into several districts, of which the chiefs are natives, though tributary to Portugal. The inhabitants are Christians, and have eight churches.

BENGORE HEAD, a cape of Ireland, on the north coast of the county of Antrim, 10 miles N. E. of Coleraine. N. lat. 55° 15′. W. long. 6° 19′.

BENGUELA, a province of Angola in Africa, retaining the name of a kingdom, bounded on the east by the river Rimba, or Cumani, on the north by the Coanza, and Culogi, at about 10° 51′. S. lat. and reaching westward quite to cape Negro, according to the generality of geographers. But M. de Lisle extends it no farther north than Old Benguela, in 9° 54′. and according to him, it is bounded on the east by the Giaga Casangi, or Giagan chief, and on the south he places the province of Ohila, between the Hottentots and Benguelas, which tract is mostly inhabited by such savage nations as the Caffres and Giagas. Benguela was formerly governed by its own kings; and most parts of the kingdom were fertile and populous; but it suffered so much from the incursions of the Giagas, and its wars with neighbouring states, that, with the protection of the Portuguese, they have not been able to recover their importance. Its valuable productions are similar to those of Angola and Congo: and from the humidity of the soil they have two fruit seasons in the year. It furnishes likewise a considerable quantity of salt, though of inferior quality to that of Chissama. The Zimbis, whose shells are current as money through several parts of Africa, are caught upon its coast, and pass in payment either by weight or measure. The country, being mostly mountainous, swarms with wild beasts, such as rhinoceroses, elephants, and wild mules. The lions, tigers, crocodiles, and other carnivorous animals, destroy great numbers of their cattle. Their fertile plains towards the sea-side formerly produced numerous herds of cattle, both small and great, but they are now become very scarce. The air of the country is so unwholesome as to affect its produce, and taint even its waters. Few Europeans have, therefore, ventured to visit it, so that it remains in a great degree unknown. The chief towns are Old Benguela, St. Philip, or New Benguela, Mankikondo, and Kaschil. The commerce of slaves is so prevalent in this province, that the natives will sell their relations or children from mere wantonness.

BENGUELA, *Old*, a town of Africa, in a province so called, south of a bay of the same name, near the Atlantic ocean. The town is seated on a high mountain, where large beeves, sheep, poultry, and other provisions, have been sold in great plenty, together with elephants' teeth; all which the inhabitants have bartered for muskets, and other fire-arms. S. lat. 11° 5′ E. long. 11° 30′.

BENGUELA, *New*, or *St. Philip*, a town in the province of Benguela, seated on the south of a large bay, about 2 leagues long and 1 broad, called by the Portuguese "Bahias-das-Vaccas," where they have a settlement and a fort, with a small garrison. S. lat. 12° 8′. E. long. 12° 20′.

BENHADAD, or the SON of ADAD, in *Scripture History*, the name of several kings of Syria. *Benhadad* I. was the son of Tabrimon, and began his reign about the year 940 B. C. He was induced by costly presents to assist Asa, king of Judah, against Baasha, king of Israel, whom he obliged to return to the succour of his own country, and to abandon Ramah, which he had undertaken to fortify. 1 Kings, xv. 18, &c. *Benhadad* II. was the son of the preceding, and his accession to the throne of Syria is stated to have taken place about the year 901 B. C. In his war against Ahab, king of Israel, he was totally defeated; and in the following year, renewing his attack upon the Israelites, in the plain of Aphek, he lost a great part of his army, and was reduced to the necessity of submitting to the mercy of Ahab, by whom he was treated kindly, and allowed to return peaceably into his own country. In a new war for the recovery of Ramoth-Gilead, the possession of which was retained by Benhadad, Ahab, joined by Jehoshaphat, king of Judah, marched against the Syrians, and a battle ensued, in which Naaman was the general of the Syrian army, and Ahab lost his life. Benhadad having afterwards laid siege to Samaria, and failing in his attempts to reduce it, fell sick, and sent Hazael his minister, to the prophet Elisha, with presents, in order to consult him concerning the issue of his disorder. Hazael, on his return to Damascus, informed Benhadad that his health would be restored; but Elisha having predicted that Hazael would succeed to the throne of Israel, the minister accomplished the prediction by stifling Benhadad with a wet towel. Benhadad was reckoned a great prince, who contributed to advance the glory of his country, and his memory received divine honours in Syria. 1 and 2 Kings. Josephus Ant. l. viii. and ix. *Benhadad* III. succeeded his father Hazael on the throne of Syria, in the year 836 B. C. After having been several times defeated by Joash, king of Israel, he was expelled from all his father's conquests. 2 Kings. Jos. Ant. l. ix.

BEN-HINNON, or GEH-HINNON, the valley of the children of Hinnon, lay in the south-east suburbs of Jerusalem. See GEHENNA.

BENI, PAUL, in *Biography*, a learned writer, was born in Candia, about the year 1552, and educated at Eugubio in the duchy of Urbino. In early life he entered among the Jesuits, but afterwards quitted them. He was for some time professor of theology at the college of Sapienza at Rome; of philosophy, at Perugia; and of rhetoric and belles lettres, in the university of Padua, from 1599 to the time of his death in 1625. He was more lively than judicious;

cious; fond of maintaining singular opinions, and much engaged in literary controversies. He attacked the dictionary of La Crusca, in a work entitled "Anti-Crusca, &c." and defended Tasso, whom, with Ariosto, he preferred to Horace and Virgil. He also wrote on the pastor-fido of Guarini. All these works were written in Italian. The most considerable of his Latin productions are, "Commentaries on the poetry and rhetoric of Aristotle," Venice, fol. 1625; "A poetic and rhetoric, extracted from the works of Plato;" "Commentaries on the six first books of Virgil, and on Sallust;" "Disput. de annal. Eccl. Card. Baronii;" and "De Historia Scribenda," lib. iv. Ven. 1611, 4to. All his works were printed at Venice, in 5 vols. fol. Gen. Dict. Nouv. Dict. Hist.

BENI Ammer, in *Geography*, a district of the western province of Algiers, about N. lat. 35° 45′. E. long. 0° 50′

Beni *Arazid*, one of the eighteen provinces into which the Turks divided Algiers, so called from its capital.

Beni *Asser*, a town of Upper Egypt, on the east side of the Nile; 2 miles north of Asna, or Esneh.

Beni *Hassan*, a town of Egypt, on the east side of the Nile, remarkable for its grottoes, dug in the mountains, which were formerly temples; 6 miles north of Achmounain.

Beni *Hazen*, called by Leo Africanus *Habat*, a province of Morocco, bounded to the north by the river Mamora, and extending south to that of Sarrat: 4 leagues from Rabat, to the east, are the provinces of Fez and Tedla, and to the west the ocean. This province is very extensive, rich, and commercial; and produces wool of a very excellent quality.

Beni *Jebie*, a town of Egypt, on the west side of the Nile, 12 miles south of Achmounain.

Beni *Headjah*, and *Beni Howah*, two districts of the western province of Algiers, bordering on the Mediterranean, about N. lat. 36° 30′. and E. long. 2° 12′.

Beni *Jubar*, mountains of Algiers, lying about 20 miles south of Bujeyah, or Bugia, and extending a considerable way along the coast, both in length and width, being parts of the little Atlas. They are steep and rugged, and furnish a great number of streams. They abound with fruit-trees, especially walnuts and figs, and produce plenty of barley, with which the inhabitants feed their numerous herds. The people are warlike, and have a chief of their own; and among them are excellent archers; and the whole ridge hath several villages, inhabited by the tribe or people whose name it bears.

Beni *Maran*, a town of Egypt, 9 miles south of Achmounain.

Beni *Menasser*, a district of the western province of Algiers, about N. lat. 36° 30′. and E. long. 2° 42′.

Beni *Mezzab*, a district of the eastern province of Algiers, between 32° and 33° N. lat., and from 7° to 7° 30′ E. long. This district is destitute of water, except that which they draw from wells.

Beni *Mida*, a district of the western province of Algiers, N. lat. 35° 30′. E. long. 2° 12′.

Beni *Misur*, a town of Egypt, on the west side of the Nile, 3 miles south of Abu Girge.

Beni *Mohamid il Kisur*, a town of Egypt, west of the Nile, and 9 miles south of Abu Girge.

Beni *Rasid*, a town of the western province of Algiers, north of the river Shelliff and near it. N. lat. 36° 10′. E. long. 2° 19′.

Beni *Shekir*, a town of Egypt; 6 miles N.W. of Manfelout.

Beni *Smal*, and *Beni Snous*, two adjoining districts of the western province of Algiers, on the confines of the Tell, about 35° N. lat. and between 0° and 1° E. long.

Beni *Zenessel* anciently *Herpalitani*, a district of the western province of Algiers, to the north of the Montes Chalcorygii, and east of the river Malva, or Mullooiah, about 34° 54′ N. lat. and 0° 30′ W. long.

Beni *Zerwald*, a branch of mount Atlas, in the western province of Algiers.

BENJA, a river on the coast of Africa, 3 leagues E.N.E. from Ampenie, and E. from Commenda.

BENJAMIN, in *Biography*, the youngest son of Jacob by Rachel, and one of the twelve patriarchs of Israel. He was the object of his father's peculiar affection, and reluctantly permitted to accompany his brethren to Egypt, when his return with them was made by Joseph the condition of their receiving a supply of corn. Joseph, who was his only brother by both parents, treated him kindly, and contrived a pretext for detaining him in Egypt, but he afterwards, when he disclosed himself, permitted him to return to his aged father. The tribe of Benjamin, which formed part of Judea, properly so called, lay between the tribes of Judah and Joseph, contiguous to Samaria on the north, to Judah on the south, and to Dan on the west, which last parted it from the Mediterranean. It had not many cities and towns, but this defect was supplied by its possessing the most considerable, and the metropolis of all, the celebrated city of Jerusalem. The other cities were Jericho, Gibeon, Bethel, Gibeah, Hai, Gilgal, Anathoth, Nebo; to which may be added the two noted villages of Bethany and Gethsemane. This tribe was at length almost exterminated by the others, in revenge of the violence offered to the concubine of a Levite, in the city of Gibeah. Genesis, Joshua, Judges.

Benjamin of *Tudela*, a city of Navarre, a Jewish rabbi, flourished in the 12th century. Possessed of a superstitious veneration for the law of Moses, and solicitous to visit his countrymen in the east, whom he hoped to find in such a state of power and opulence as might redound to the honour of his sect, he set out from Spain in the year 1160, and travelling by land to Constantinople, proceeded through the countries to the north of the Euxine and Caspian seas, as far as Chinese Tartary. From thence he took his route towards the south, and after traversing various provinces of the farther India, he embarked on the Indian ocean, visited several of its islands, and returned, at the end of 13 years, by the way of Egypt, to Europe, with much information concerning a large district of the globe, altogether unknown at that time to the western world. He died in 1173, not long after his return from his travels. His "Itinerary" contains a narration of his travels, intermixed with many fabulous accounts, that serve to raise the credit of his nation. Caspar Oudin, however, (Comment de Script. Eccles. tom. ii. col. 1524. Lipsi. 1722.) represents him as a man of sagacity and judgment, and well skilled in the sacred laws; and says that his observations and accounts have been found upon examination to be generally exact, and that the author was remarkable for his love of truth. The first edition of the Itinerary appeared at Constantinople in 1543, with a translation from the Hebrew into Latin, by Benedict Arias Montanus; and it was printed by Plantin, at Antwerp, in 1575, 8vo. It was afterwards translated by the emperor Constantine, and his version was printed at Leyden, by Elzevir, in 1633, 8vo. A French translation of it was published by John Philip Baratier, in 1734, 2 vols. 8vo. Robertson's America, vol. i. p. 45. Gen. Dict.

Benjamin *Tree*, in *Botany*. See Laurus.

Benjamin, in *Pharmacy*. See Benzoin.

BENJAR River, in *Geography*. See Bendermassin.

BENIBOURD, a mountain of the Highlands of Scotland, probably higher than Caringorm, which is 4060 feet.

BENICARLOS, a town of Spain, in Valencia, celebrated for the wine made in its neighbourhood; 3 miles north of Penniſcola.

BENIDORME, *Mount* and *Cape*, lie about S.S.W. from cape St. Martin, on the ſouth point of Altea bay, projecting eaſtward from the town, which gives it name; to the ſouth of which is the iſland Benidorme, 2 miles off; at the north-eaſt end of Alicant bay, on the eaſt coaſt of Spain, in the Mediterranean.

BENIFAJO, a town of Spain in Valencia; 5 leagues from Valencia.

BENILET, a town of Aſia, in the Arabian Irak; 145 miles N.W. of Baſſora.

BENIMERINI, the denomination of an African dynaſty, which ſucceeded that of the Almohedes, which ſee.

BENIN, an extenſive kingdom of weſt Africa, comprehending the ſlave coaſt, bounded on the weſt by Guinea proper, or, more particularly, the Gold coaſt; on the north by Gago, Nigritia, and a chain of mountains; on the eaſt by Mujaac and Makoko, and part of Congo, with the Ethiopic ocean, on the ſouth, where it extends about one degree beyond the equinoctial line. It is commonly divided into three parts, *viz.* Whydah and Ardrah, containing the Slave coaſt, and Benin proper, which has the ſame boundaries with the former on the north, eaſt, and ſouth, and is terminated on the weſt by part of the gulf of Guinea and the Slave coaſt. Its extent from weſt to eaſt is about 600 miles, but from north to ſouth it is not aſcertained. From the river Lagos, where it commences, its coaſt forms a gulf or bight, ending at cape Lopez, in which are the trading places, or villages, ſeated on ſeveral rivers, of Benin, Bonny, Old and New Calabar, Camaron, and Gabon. Benin is watered by ſeveral ſtreams, of which ſome are conſiderable rivers. Towards the ſea-coaſt the land is low and marſhy, and of courſe the climate unhealthy; but at a greater diſtance from the ſea the land riſes, and the air is more pure. In ſome diſtricts of the country, water is ſo ſcarce, that travellers are often ſupplied with it for money by officers, to whoſe department it belongs. The rivers teem with crocodiles, ſea-horſes, a particular ſpecies of torpedo, and various kinds of excellent fiſh. The country abounds with elephants, tigers, leopards, wild boars, aſſes, civet and mountain-cats, horſes, hares, and hairy ſheep; and among its birds the principal are paroquets, pigeons, partridges, ſtorks, and oſtriches. The ſoil is generally fertile, and produces a great variety of trees and plants, ſuch as orange, lemon, and cotton trees. The pepper of this country is not ſo plentiful nor ſo good as that of the Eaſt Indies. The native negroes are in general mild and good humoured, civil to ſtrangers, and yet reſerved, eaſily wrought upon by gentle means, but inflexible and reſolute in reſiſting harſh treatment. In the conduct of buſineſs they are expert; but attached to their ancient cuſtoms and manners, which renders them ſlow and tedious in their negotiations. Honeſt and faithful in their dealings, they ſeldom or ever diſappoint the confidence that is repoſed in them. Their trade is carried on by a kind of brokers, called mercadors, or fiadors, who treat with ſtrangers about all merchandize; but all their contracts are made with great ſecrecy, through fear of exciting the jealouſy or avarice of their governors; and the richeſt perſons exhibit the appearance of poverty, in order to eſcape the rapacious hands of their ſuperiors.

The population of Benin is diſtributed into three claſſes of perſons. The firſt is compoſed of three perſons, called great lords, who attend the king, and preſent petitions to him. Such is the influence of theſe, that the ſupreme government may be ſaid to be lodged with them. The next claſs conſiſts of thoſe petty princes called "ares de roe," or ſtreet kings, of whom ſome preſide over the commerce, others over the ſlaves; ſome over military affairs, and others over every thing pertaining to cattle and the fruits of the earth. Out of this claſs are choſen the viceroys and governors of provinces, who are reſponſible to the three great lords, to whoſe recommendation they owe their appointment. Each of them is preſented by the king with a ſtring of coral as a badge of office, which he is obliged always to wear about his neck, under the penalty of degradation, and even death. The third order conſiſt of the fiadors, the mercadors, or merchants; the fuliaders, or pleaders, and the veilles, or elders, all of whom are reſpectively diſtinguiſhed by ſome peculiar mode of wearing the coral chain. The loweſt claſs is formed by the plebeians, who are generally indolent and poor. The whole burden of labour, ſuch as tilling the ground, ſpinning cotton, weaving cloth, and even cleaning the ſtreets, is devolved upon the women. The chief workmen are ſmiths, carpenters, and leather-dreſſers: but in every occupation of this kind they are extremely awkward and artleſs. The common diet of the natives is beef, mutton, or fowls, and their bread is made of yams, beaten into a ſort of cake. The meaner perſons ſubſiſt on ſmoked or dried fiſh, and bread made of yams, bananas, and beans, mixed together. The drink of the poor is water, and that of the richer, water mixed with European brandy. The king, and perſons of rank, ſupport a certain number of poor, ſelected from the blind, lame, and infirm; the lazy, who will not labour, are ſuffered to ſtarve; and by this excellent police, not a beggar or vagrant is to be ſeen. The natives of Benin are diſtinguiſhed by their liberality; but in the exerciſe of it they are extravagantly vain and oſtentatious. The dreſs of the natives is neat and ornamental; that of the rich, in which they appear in public, conſiſting of white calico, or cotton drawers, covered with another fine piece of calico plaited in the middle, and bound under a ſcarf, the ends of which are adorned with a handſome lace or fringe. The upper part of the body is moſtly naked. The ladies of better faſhion wear fine calico, beautifully chequered with various colours. The face and upper part of the body is covered with a thin veil, and the neck adorned with a ſtring and chain of coral. Upon their arms and legs they wear bright copper or iron bracelets, meanly wrought. The perſons of the women are not diſagreeable. The children go naked till the age of ten or twelve years; their whole dreſs, before this period, conſiſting of a few ſtrings of coral tied round the waiſt. The men neither curl nor adorn their hair; but they form part of it into locks, to which they ſuſpend a bunch of coral. The women dreſs their hair with great art in a variety of forms, and occaſionally apply to it a kind of nut-oil, which deſtroys its black colour, and in time changes it into green or yellow.

The men marry as many women as their circumſtances allow; but they have ſcarcely any nuptial ceremony. Jealouſy is very prevalent, and adultery is ſeverely puniſhed; but the violation of the marriage-bed is leſs known in Benin than in any other country. Male infants, as ſoon as they are born, are preſented to the king, as rightfully belonging to him; but the females, being deemed the property of the father, are left wholly to his care and diſpoſal. Both male and female children are circumciſed, when they are about a fortnight old; and they are marked over their bodies with various inciſions, that expreſs certain figures. In ſome parts of Benin twin births are reckoned a happy omen; but at Aerbo, they are reputed a bad omen, and both the twins and their mother

mother are put to death. The inhabitants of Benin are less afraid of death than the other natives of the same coast. Such is their attachment to their own country, that those who die in other provinces are preserved for years, till they can be conveyed for burial to their native soil. On occasions of mourning, which is usually limited to 14 or 15 days, some shave their hair, others their beard, and others but half of either. The last obsequies of their kings are performed with some very extraordinary ceremonies. When the tomb-stone is laid, they crown it with a banquet of the most delicate wines and sweetmeats, of which all are allowed to partake; and the mob, intoxicated with liquor, are guilty of the wildest excesses and riots. Those who obstruct them, as men, women, children, and even brute animals, are put to death; and having cut off their heads, they carry them to the royal sepulchre, and throw them in as offerings to the deceased king, together with all the cloaths and effects of those whom they have sacrificed to his manes. Nevertheless, amidst these barbarous customs, the kingdom of Benin is governed by laws, which breathe nothing but humanity, and sympathy for misfortune and distress.

As to the religion of this country, it is a strange mixture of good sense and absurdity. With some just notions of a Supreme Being they blend many absurd and idolatrous ceremonies. The "Fetisso" is worshipped here, as well as in all the other countries on the western coast of Africa. To every evil they give the name of devil, and worship him from fear, and to prevent his doing them injury; and they honour both God the Creator, and the evil spirit, by sacrifices and offerings. They are believers in apparitions; and they conceive that the ghosts of their deceased ancestors walk on the earth, and occasionally appear to them in their sleep to warn them of their danger, which they endeavour to elude by sacrifices. All their houses are full of idols, and they have particular huts or temples for the residence of their gods. Their priests also are numerous; and the grand, or high priest of Lacho, a town seated at the mouth of the river Formosa, is particularly famous for his skill in magic, and is never approached without the most profound veneration and awe. Besides their sabbath, a day of repose which occurs every fifth day, they have many other days appropriated to religious purposes. At some of their festivals they sacrifice not only a great variety of brutes, but likewise a number of human victims, who are usually condemned criminals, reserved for this purpose. They have one annual feast in commemoration of their ancestors; but their greatest festival is that called the coral feast, on which day alone the king appears to his people in great pomp, attended by 600 of his women. Wine and provisions are distributed on this occasion among the people, and the day ends in gluttony, drunkenness, and riot.

The government of Benin is despotic. The empire is divided into a great number of petty royalties, all of which are subject to the king of Benin, whose authority is absolute, and commands the most blind and servile obedience. The reigning monarch, when he apprehends his dissolution to be approaching, commands one of his sons to fill the throne, with an injunction, under pain of death, not to reveal the secret till after his death. When this happens, the destined sovereign is removed to the town of Ofcebo, a few miles from Benin, the capital, where he remains for some time to be instructed in the art of government, and the duties of a king. Upon his return, his first care, for securing his future tranquillity, is to murder his brothers, and thus to remove every rival to the crown. The royal revenues are very considerable; to these every governor contributes a large sum; and the inferior officers pay their taxes in cattle, fowls, cloth, and other commodities. Certain duties are also laid upon foreign trade; besides the annual taxes paid to the governor for the privilege of commerce, a sixth of which belongs to the king. It is said that the sovereign of Benin is so powerful a prince, that, in one day, he can assemble an army of 20,000 men, and in a few days more 100,000. His troops, however, are destitute of courage and conduct, and observe neither order nor discipline; and, indeed, are merely a cowardly tumultuous rabble, which leave him exposed to the incursions of pirates and robbers, that are suffered to pillage and destroy, and sometimes to advance even to the capital. The arms used by them are swords, poniards, javelins, bows, and poisoned arrows.

The capital of this kingdom is Benin. The other principal towns, or rather villages, are Bododo, Arebo, Agatton, Awerri, and Meiberg.

All the slaves purchased on this part of the African coast, except a tribe distinguished by the name of "Mocoes," are called in the West Indies "Eboes," probably from Arebo, on the river Benin. In language they differ both from the Gold Coast negroes, and those of Whydah, and in some respects from each other; and in complexion they are much more yellow than the others; but their colour is a sickly hue, and their eyes appear as if suffused with bile, even when they are in perfect health. These Eboes appear, in general, to be the lowest and most wretched of all the nations of Africa. The great objection to them as slaves is, their constitutional timidity, and despondency of mind; which lead them very frequently to seek, in a voluntary death, a refuge from their own melancholy reflections. They require, therefore, the gentlest and mildest treatment to reconcile them to their situation; but if their confidence be once gained, they manifest as great fidelity, affection, and gratitude, as can reasonably be expected from men in a state of slavery. The females of this nation are better labourers than the men, probably from having been more hardly treated in Africa. These Eboes, notwithstanding the depression and timidity which they manifest, on their first arrival in the West Indies, and which give them an air of softness and submission, forming a striking contrast to the frank and fearless temper of the Koromantyn Negroes, are in reality more savage than the people of the Gold Coast; insomuch, that many tribes among them, and especially the Mocos tribe, have been accustomed to the shocking practice of feeding on human flesh. In their religious worship, they adore certain reptiles, of which the guana, a species of lizard, is in the highest estimation, and in the worship of this animal, it is said, that they offer human sacrifices. Mod. Un. Hist. vol. xiii. p. 272, &c. Edward's Hist. West. Ind. vol. ii. p. 75.

Benin, a city of Africa, and capital of the kingdom above described. It is pleasantly seated on the river Benin, or Formosa, about 69 miles from Agatton, at the mouth of the river, and is said to be 4 miles in circumference, and to contain 30 long, broad, and straight streets of low houses. The streets are adorned with a variety of shops filled with European wares, as well as the commodities of the country, such as cattle, cotton, and elephant's teeth. In their markets they expose to sale, for food, dogs, of which the Negroes are fond; and also roasted monkies, apes, and baboons. Bats, rats, lizards, dried in the sun, palm-wine, and fruit, form the most luxurious entertainment, and stand always exposed to sale in the streets. As the country affords no stone, the houses are built with mud and clay, covered with reeds or straw; and they are separated from one another by chasms and ruins, that indicate its decay. The entrance into the city is by a gate of wood, which is defended by a bastion of mud and earth: and it is surrounded by a deep ditch 40 feet wide. A guard is stationed at this gate to receive the tolls, duties, and imposts collected from the merchandize. None but natives are permitted

permitted to live in the city; and of these some are wealthy, and carry on an extensive trade, which is committed to their wives, who go to all the circumjacent villages, and traffick in all sorts of merchandize, and who are obliged to bring the greatest part of their gains to their husbands. A principal part of the city is occupied by the royal palace, which is more distinguished by the extent of its dimensions than by the commodiousness or elegance of the structure. All the male slaves in this town are foreigners; for the inhabitants cannot be sold for slaves, and only bear the name of the king's slaves. This is one of the European marts for the purchase of slaves. N. lat. 6° 10′. E. long. 5° 6′.

Benin, *River of*, called by Juan Alfonso de Aveiro, a Portuguese, who is said to have first discovered the country, *Formosa*, on account of the verdure and beauty of its banks; a considerable river of Africa, in the kingdom of Benin. It divides itself into several branches; and has some towns or villages on its banks, in which Europeans, and particularly the Dutch, carry on a commerce. Notwithstanding the beauty of its adjacent scenery, the air is noxious and pestilential, on account of the vapours exhaled by the sun's heat from its marshy banks; and it is much infested by the mosquito flies. The entrance into this river is in N. lat. 6° 38′, and E. long. 4° 47′.

Benin-*Dazy*, *St.* a town of France, in the department of Niévre, and chief place of a canton, in the district of Nevers. The place contains 1583, and the canton 10,565 inhabitants: the territory includes 350 kilometres, and 21 communes.

BENISH Days, among the Egyptians, a term for three days of the week, which are days of less ceremony in religion than the other four, and have their name from the *benish*, a garment of common use, not of ceremony. In Cairo, on Sundays, Tuesdays, and Thursdays, they go to the bashaw's divan; and these are the general days of business. Fridays they stay at home, and go to their mosques at noon; but though this is their day of devotion, they never abstain from business. The three other days of the week are the benish days, in which they throw off all business and ceremony, and go to their little summer-houses in the country.

BENISOUEF, in *Geography*, a town of Egypt, on the west side of the Nile. According to Savary, it is half a league in circumference; and Sonnini says, that of all the places situated along the Nile, from Cairo, or for the space of more than 30 leagues, this is the largest, as well as the most affluent. The houses are only cottages of brick and earth, coarsely constructed; but the lofty minarets, vying in height with the surrounding date-trees, and discovered through their highest branches, present an agreeable object to the view. A manufacture of coarse carpets renders this a commercial town; and the adjacent plains are fertile and productive, so that the people who cultivate them appear less distressed and wretched than those who live near the capital. Benisouef is the residence of a bey, or, in his absence, of a kiaschef, who levies with an armed force his arbitrary tributes. Over against Benisouef stands the village of "Baird," partly inhabited by Copts; and on the same side of the river, and at the distance of 3 leagues, is "Bebé," a large village, the residence of a kiaschef, where are a mosque and a convent of Copts. Benisouef lies in N. lat. 29° 14′. E. long. 30° 58′.

BENITO, St. a small island of the north Pacific Ocean, on the north-west coast of America, surrounded with rocks and islets. N. lat. 27° 41′. E. long. 244° 38′.

Benito, *St.* or *St. Bennet*, a river of Benin, in Africa, that discharges itself 7 leagues S. by W. from the bight of Biafra, and on the south side of the river Campo, into the gulf of Guinea. On the north side of this river stands a great hill, called the Hayburn. N. lat. 1° 45′. E. long. 8° 10′.

BENIVIENI, Girolamo, in *Biography*, was born at Florence, in 1452, and contributed under the auspices of Lorenzo de Medici, to reclaim the Italian poetry from its mean and trivial state, and to renew the style and manner of Dante and Petrarch. The principal topic of Benivieni was divine love, which he cloathed with the sentiments of Platonism, and thus obscured the poetical beauties of his works by mysticism. He was esteemed on account of his integrity and virtue, and employed by Pico, prince of Mirandola, as his almoner. He died at Florence in 1502, and was buried in the same tomb with his friend Pico. His works were printed at Florence in 1500, and again with additions in 1519. Nouv. Dict. Hist.

BENLAWERS, in *Geography*, a lofty mountain, being the chief summit of the Grampian chain, near Kenmore, in Perthshire, Scotland. One of its sides rises from the banks of the Tay, and, assuming a conical shape, elevates its summit about 4015 feet above the level of the sea.

BENLOJA, in *Ichthyology*, the name by which the Swedes call the *common bleak*, *cyprinus alburnus* of Linnæus.

BENLOMOND, in *Geography*, a mountain of Scotland, situated in the parish of Buchannan, in Dumbartonshire. Though not so lofty as Bennevis or Benlawers, yet its insulated situation, with respect to the neighbouring hills, and broad lake of Loch Lomond spreading at its base, give it great magnitude and grandeur. It is computed to be 3260 feet above the level of the sea, and 3240 from the surface of the lake. The form it assumes nearly resembles a truncated cone, and its sides, particularly towards the lake, are finely mantled with natural woods. Its north-side is exceedingly steep, but on the south-west it may be easily ascended. On the north-east side is the source of the river Forth, which, like most mountain streams, soon becomes a rapid river, and is alternately seen expanding into a lake, or darting over some craggy precipices. Benlomond is mostly composed of granite, interspersed with large masses of quartz, and near the base are large strata of micaceous schistus, some of which is also found at the top of the mountain. Sinclair's Statistical Account of Scotland.

BENNA, in *British Antiquity*, a kind of carriage, which was used for travelling rather than for war. It contained two or more persons, who were called "Combennones," from their sitting together in this machine. The name was probably derived from the British word "Ben," or pen, which signifies head, or chief; and these carriages might, perhaps, have got this appellation from the high rank of the persons who used them.

BENNAVENNA, or Bannavanto, in *Ancient Geography*, a town of Britain, in the Itinerary of Antonine, placed by Camden, Gale, and Stukely, at Weedon, a village six miles west of Northampton, but by Mr. Horsley, for reasons which he has stated, and which seem to be satisfactory, at or near Daventry.

BENNECKSTEIN, a town of Germany, in the circle of Upper Saxony, and county of Klettenberg; 22 miles S.S.W. of Halberstadt.

BENNECUM, in *Geography*, a town of Guelderland, 2 miles north of Wageningen.

BENNET, Christopher, in *Biography*, was born at Raynton, in Somersetshire, about the year 1617. After the usual school education, he was entered at Lincoln college, Oxford, in the year 1632, where he proceeded bachelor, and then master of arts, but seems to have acquired his knowledge of medicine at Leyden, or some other university, where he took his degree of doctor. He then came to London, was admitted fellow of the college of physicians, and appears to have had a considerable share of reputation and practice. In 1646,

1646, he published "Theatrum tabidorum, seu phthiseos, atrophiæ, et hecticæ, xenodochium," 8vo. London: a work of learning and ingenuity, but abstruse and theoretical. He made a number of curious experiments to discover the qualities of the blood in phthisical patients. He had seen diseases of the breast, he says, relieved by discharges from the legs; and on the other hand, phthisical complaints occasioned by suppressing hæmorrhage from the nostrils. He observes, that consumption not unfrequently occurs in England, unattended with affection of the lungs. The work has been translated into most of the modern languages, and passed through numerous editions, though now almost forgotten. He also republished, with observations, Mouset's treatise, called "Health's Improvement." He died tabid, in April 1655, and probably had been induced to employ so much of his time and labour in acquiring a knowledge of the disease from his own sufferings. Haller. Bib. Med. Pract.

Bennet, Henry, earl of Arlington, an eminent statesman, and favourite minister of king Charles II. was born of a good family in the county of Middlesex, in 1618, educated at Christ-church college, in the university of Oxford, where he distinguished himself by his application, and by his turn for English poetry; and upon the king's coming to Oxford, at the breaking out of the civil war, entered himself into his service, both as a volunteer in the royal army, and as private secretary to lord Digby, secretary of state. Upon the failure of the royal cause, he went over to the continent, and became secretary to the duke of York, and possessed the full confidence and esteem of the royal family. In 1658, he received the honour of knighthood from Charles II. and was sent by him in the quality of his minister to the court of Madrid. Soon after the king's restoration, sir Henry Bennet was recalled from Madrid, and in 1662, promoted to the office of secretary of state. In 1664, he was created baron of Arlington, and at that time was considered as the king's chief minister and favoured servant. He is supposed to have been at the head of the party who procured the fall of the chancellor Clarendon. The conduct of foreign affairs was chiefly entrusted to him, and he had a great share in the first Dutch war. About this time he introduced Mr. (afterwards sir) Wm. Temple, into public employment. He formed one of the principal characters in the ministry of that period, distinguished by the appellation of the *cabal*. From the collection of letters, published by John Dalrymple it appears, that lord Arlington was one of the commissioners, who, in 1670, concluded and signed at Dover, with Mons. Colbert, the French ambassador, a secret league between Charles II. of England, and Lewis XIV. of France; by which Charles agreed to declare himself a Roman catholic, and to engage in a war for the destruction of the United Provinces. By one article of this treaty it was stipulated, that his most Christian majesty was to furnish the king of England, before he declared himself a catholic, with the sum of 200,000*l.* sterling. In consideration probably of this service, however reproachful to those who conducted it, and degrading to the king their master, and as a recompence for other ministerial duties, lord Arlington was raised, in 1672, to the dignity of earl of Arlington, and Viscount Thetford, and decorated with the order of the garter. In 1674, his conduct, and that of his colleagues in office, fell under the suspicion of the commons; and an impeachment was moved against him, which he escaped by a small majority. In that year he exchanged the office of secretary of state for the less responsible, and merely honorary one of lord chamberlain: and soon after he was deputed, with two other commissioners, on business of importance to the prince of Orange; but not succeeding in the conduct of it, his interest at court declined. This was partly owing to his affected zeal against popery, though he had been always regarded as a secret friend to the popish party, and was in reality a convert to that religion. He retained however, in outward appearance, the favour of the king; and after the accession of James II. who had no affection for him, he retained the office of chamberlain. He died in July, 1685, having previously, on his death-bed, as it is said, reconciled himself to the church of Rome. By his wife, who was daughter of Lewis de Nassau, lord of Beverwaert in Holland, he left one daughter, married to the earl of Euston, afterwards duke of Grafton, natural son of Charles II.

"The character of lord Arlington seems to have been that of a thorough courtier; accommodating, easy, artful, with the habits of public business, rather than extensive abilities, and the moderation of timidity rather than the restraint of principle. He had little knowledge of the English constitution, and less regard to it; but he wanted firmness and resolution to take the lead in arbitrary measures. His public letters, when secretary, were published in 1701, 2 vols. 8vo." Biog. Brit. Gen. Biog.

Bennet, Thomas, an eminent divine of the church of England, was born in the city of Salisbury in 1673, and sent for completing his education to St. John's college, Cambridge, in the beginning of the year 1688. Before he had attained the age of 21 years, he took the degrees of bachelor and master of arts; and he was chosen fellow of his college. In 1695, he wrote a copy of Hebrew verses on the death of queen Mary, printed in the Cambridge collection of verses on that occasion. In 1699, he entered into the controversy between the church and the dissenters, and published "An Answer to the dissenters' pleas for separation, or an abridgement of the London cases." In the year 1700, he was presented to the rectory of St. James's at Colchester, where he became a very popular preacher. During his residence in this place, he published "A confutation of Popery," several tracts of controversy with the dissenters on the subject of "Schism," and also "A confutation of Quakerism." He also published "A Paraphrase, with Annotations upon the book of Common Prayer," with two letters relating to the same subject; and "The Rights of the Clergy of the Christian Church." About the year 1711, he took the degree of doctor in divinity. As his popularity declined at Colchester, and his salary, which partly depended on voluntary subscriptions, was reduced from 300*l.* to 60*l.* a year, he determined to remove to London, and accordingly accepted the office of deputy chaplain to Chelsea hospital; and this appointment was succeeded by the two lectureships of St. Olave's, Southwark, and St. Lawrence Jury. Before his removal to London in 1716, he published, in 1714, an 8vo. treatise, intitled "Directions for studying;" and in the following year, his "Essay on the thirty-nine articles of Religion, &c. and the case of subscription to the articles considered in point of law, history, and conscience, with a prefatory epistle to Anthony Collins, Esq." supposed to be the author of "Priestcraft in Perfection," published in London in 1709. In 1716, he published a pamphlet, entitled "The Nonjurors' separation from the church of England examined, and found to be schismatical on their own principles," and a sermon on "The case of the Reformed Episcopal churches in Great Poland, and Polish Prussia." Soon after, he was presented by the dean and chapter of St. Paul's to the vicarage of St. Giles, Cripplegate, which afforded him a liberal income, amounting, after several deductions, to 400*l.* a year. For this preferment he was indebted to the private interference and recommendation of bishop Hoadly. After his settlement in this parish, in 1717, his tranquillity was inter-

interrupted by ſome law-ſuits in which he was engaged for recovering dues that belonged to the church. However, he publiſhed, in the ſame year "A Spital Sermon;" and in 1718, "A Diſcourſe of the ever-bleſſed Trinity in Unity, with an examination of Dr. Clarke's Scripture Doctrine of the Trinity." From this time the haraſſed ſtate of his mind, and the weight of parochial duties, prevented his undertaking any new work, except "An Hebrew Grammar," publiſhed at London, in 1716, 8vo. and intended for the uſe of ſuch as want to learn Hebrew without the aſſiſtance of a maſter. He died at London of an apoplexy, in the 56th year of his age, on the ninth of October 1728, and was buried in his own church. Dr. Bennet, though a man of ſtrong paſſions, and not altogether exempt from the charge of haughtineſs, was diſtinguiſhed by his piety and integrity, by the diligence and zeal with which he devoted himſelf to the ſtudies and duties of his profeſſion, and by his extenſive learning, more eſpecially by his ſkill in the oriental and other learned languages. As an acute reaſoner and accurate textuary, he had few equals. His talents for controverſial writing, which perhaps he indulged to exceſs, gave him a decided advantage, particularly in his diſputes with diſſenters, over incompetent antagoniſts; but on ſome occaſions they led him to recur to diſtinctions and refinements, which would not always bear examination, and which laid him open to the attacks of his adverſaries. Several of his writings, as they related to temporary controverſies, have been conſigned to oblivion. Thoſe which have excited attention in modern times, are his "Diſcourſe of the trinity," and his "Caſe of Subſcription to the Articles of the Church of England." His explication of the Trinity has been charged with inclining to that heterodoxy which he wiſhed to avoid, and which, without doubt, he ſincerely abhorred: and his defence of ſubſcription has undergone ſome ſevere ſtrictures by the acute and learned author of the "Confeſſional." It redounds much to the honour both of Dr. Bennet and biſhop Hoadly, when we conſider the diſparity of their opinions, that the latter contributed to the preferment of the former. Gen. Dict. Biog. Brit.

Bennet, *Herb*, in *Botany*. See Geum.

BENNEVENAGH, in *Geography*, a large mountain in the northern part of the county of Londonderry, province of Ulſter, Ireland, about 8 miles weſt of Coleraine.

BEN-NEVIS. See Ben-*Nevis*.

BENNI, in *Ichthyology*, a name given by Boſc after Sonnini, to the ſpecies of Cyprinus which inhabits the river Nile, and is deſcribed by Forſkal under the ſpecific name of *bynni*. See Bynni.

BENNINGTON, in *Geography*, a county of America, in the ſouth-weſt corner of Vermont, bounded by Windham county on the eaſt, the ſtate of New York on the weſt, Rutland county on the north, and the ſtate of Maſſachuſetts on the ſouth. It contains 19 townſhips, of which Bennington and Mancheſter are the chief. It has 12,254 inhabitants, including 16 ſlaves. The mountains abound with iron ore, which employs already a furnace and two forges.

Bennington, the ſhire town of the above county, and the principal town in Vermont, including in the compact part of the town about 160 houſes, is ſituated near the foot of the green mountain, near the ſouth-weſt corner of the ſtate, 24 miles eaſterly from the junction of Hudſon and Mohawk rivers, and about 52 miles from the ſouth end of lake Champlain, at the confluence of the eaſt and ſouth bays; 55 miles from Rutland, 202 north-eaſterly from New York, and 300 in the ſame direction from Philadelphia. N. lat. 42° 42′. W. long. 74° 10′. It has a number of elegant houſes, and is a flouriſhing town, containing 2400 inhabitants. Its public buildings are a congregational church, a court-houſe, and gaol. It is the oldeſt town in the ſtate, having been firſt ſettled in 1764. Within the townſhip is mount Anthony, which riſes to a great height in a conical form. The defeat of the Britiſh in two battles fought near this town, in 1777, contributed in a great meaſure to the ſubſequent ſurrender of general Burgoyne's army.

BENNISCH, a town of Sileſia, in the principality of Jagerndorf.

BENOIST, St. a town of France, in the department of the Loiret, and chief place of a canton in the diſtrict of Gien; 6 leagues ſouth-eaſt of Orleans.

Benoist, St. *du Sault*, a town of France, in the department of the Indre, and chief place of a canton, in the diſtrict of Argenton; 3¼ leagues S.S.W. of Argenton. N. lat. 46° 27′. E. long. 1° 17′.

Benoist, St. *de Seyſſieu*, a town of France, in the department of the Ain, and chief place of a canton, in the diſtrict of Belley, 1¾ league ſouth-weſt of Belley.

BENOIT, or Benedictus, Renatus, in *Biography*, a famous doctor of the Sorbonne, and curate of St. Euſtathius at Paris, was born at Sevenieres near Angers; and being a ſecret favourer of the proteſtant religion, he publiſhed, for the benefit of the people, a French tranſlation of the Bible, which had been made by the reformed miniſters of Geneva; but as ſoon as it was publiſhed, it was condemned. Benoit was appointed by Henry III. in 1587, regius profeſſor of divinity in the college of Navarre at Paris; and ſome time before the death of this prince, he publiſhed a book, entitled "The Catholic Apology," the deſign of which was to ſhew that the proteſtant religion, profeſſed by Henry, was no juſt reaſon for depriving him of his right of ſucceſſion to the crown of France. This was followed, in 1590, by a defence of the ſame book. Benoit afterwards aſſiſted at the aſſembly in which Henry IV. abjured the reformed religion; and he was promoted by the king, in 1597, to the biſhopric of Troyes in Champagne; but he was ſo obnoxious to the pope, on account of his tranſlation of the Bible, his favour to the proteſtants, and his ſtrenuous aſſertion of the liberties of the Gallican church, that he could never obtain his bull, to be inſtalled: however, he retained the temporalities till the year 1604, when he reſigned the biſhopric. He died at Paris in 1608. He was the author of ſeveral treatiſes, which are now not worth mentioning. Gen. Dict.

Benoit, Elias, a learned French proteſtant miniſter, was born at Paris in 1640. After the revocation of the edict of Nantes, he ſought refuge in Holland, and became paſtor in the church at Delf, where he died in 1728. He was patient, timid, ſubmiſſive, and laborious, and in his domeſtic connection he found ample occaſion for the exerciſe of the virtues that diſtinguiſhed his character. Of his wife he gives the following account: "I married a wife poſſeſſed of all the faults that could torment a peaceable huſband; covetous, pert, peeviſh, and capricious; by her unwearied ſpirit of contradiction, ſhe plagued, in every poſſible way, her wretched mate for the ſpace of 47 years." His only relief was inceſſant ſtudy, the fruits of which were the following publications, written in French, viz. "A Hiſtory of and Apology for the Retreat of the Paſtors on account of the Perſecution in France," 12mo. 1688; "A Hiſtory of the edict of Nantes," 5 vols. 4to. Delft. 1693; and "Miſcellaneous Remarks, critical and hiſtorical, on Toland's two Diſſertations," 8vo. 1712. Nouv. Dict. Hiſt.

Benoit, Father, a learned Maronite, whoſe Arabic name was *Ambarach*, was born at Guſta, in Phœnicia, of a noble family, in 1663. Having ſtudied from the age of nine years to twenty-two, in the Maronite college at Rome, he returned

returned to the eaſt, and was ordained prieſt by the Maronite patriarch of Antioch, and from thence he was ſent to Rome, in order to tranſact ſome affairs relating to the church at Antioch. Previouſly to his propoſed return, he was invited to Florence by the grand duke Coſmo III. where he was employed in arranging the types which Ferdinand de Medicis had cauſed to be founded for printing books in the oriental languages. Under his inſpection ſeveral eaſtern manuſcripts were printed. Coſmo, in order to retain Benoit in his ſervice, appointed him Hebrew profeſſor at the univerſity of Piſa, where he acquired great reputation for his character and learning among the literati of Italy. At the age of 44, he entered into the ſociety of Jeſuits, and was employed by Clement XI. as one of the correctors of the editions of the Greek fathers; and on the ſolicitation of cardinal Quirini, whom he had aſſiſted in his ſtudies, he publiſhed, at an advanced age, an edition of "Ephrem Syrus;" the two firſt volumes of which, begun in 1730, were, after twelve years' labour, given to the public; but in 1742, whilſt he was proſecuting the third, and after he had advanced through one half of it, he was carried off by a ſevere illneſs in his 80th year. This volume was completed by Aſſemanni, in 1743. Benoit alſo tranſlated part of the Greek Menology, and wrote ſome diſſertations relating to the works of Ephrem Syrus. Moreri. Gen. Biog.

BENOIT, *du Sault, St.* in *Geography*, a town of France, in the department of the Indre, and chief place of a canton in the diſtrict of La Blanc. The place contains 1081, and the canton 10,516 inhabitants; the territory includes 355 kiliometres, and 14 communes.

BENON, a town of France, in the department of the Lower Charente, and chief place of a canton, in the diſtrict of Rochefort; 5½ leagues N.N.E. from Rochefort.

BENOU, a town of Arabia, 110 miles ſouth-eaſt from El Catif.

BENOWN, the capital of Ludamar, an interior kingdom of Africa, placed by Rennell in N. lat. 15° 6′. W. long. 6° 58′. See LUDAMAR.

BENRAD, a town of Germany, in the circle of Weſtphalia, and duchy of Berg; 7 miles S.S.E. of Duſſeldorp.

BENSEN. See BENESSOW.

BENSBERG, a town of Germany, in the circle of Weſtphalia, and duchy of Berg; 7 miles eaſt of Mulheim.

BENSERADE, ISAAC DE, in *Biography*, a celebrated French poet, was born at Lions, near Roan, in Normandy, in 1612. The vivacity of his genius, and the pleaſantry of his converſation, were well calculated to ſecure his reception at court, and to promote his advancement under the patronage of cardinals de Richelieu and Mazarin, who provided for him in a liberal manner by gifts and penſions. The poetry in which he excelled was that of the gallant and ſatirical kind, compoſed for the court-ballets, before operas came into vogue; and in theſe he ingeniouſly adapted to the perſonages of antiquity the known characters and adventures of thoſe who repreſented their parts in fiction. His ſucceſs in this way induced him to make an attempt for turning all Ovid's Metamorphoſes into rondeaus; but this work, though favoured by the king, and ſet off by all the ornaments of engraving, was ridiculed from its firſt appearance. As he aimed at point and conceit, the prevalence of a better taſte in the age of Lewis XIV. ſunk him into neglect. In 1674, he was choſen a member of the French academy. Towards the cloſe of his life, he abandoned the court, and retired to Gentilly, where he embelliſhed his houſe and gardens with a variety of ornaments that indicated his poetical genius. He was much afflicted with the ſtone, the excruciating pain of which he is ſaid to have endured with fortitude and reſignation. His later years were conſecrated to works of piety and devotion; and he tranſlated almoſt all the Pſalms. He died in 1691; and after his death his works were printed in two volumes. Gen. Dict. Nouv. Dict. Hiſt.

BENSHAUSEN, in *Geography*, a town of Germany, in the circle of Franconia, and county of Henneburg; 7 miles ſouth-eaſt of Smalkalden.

BENSHEIM, a town of Germany, in the circle of the Upper Rhine, and archbiſhopric of Mayence; 20 miles north of Heidelberg.

BENSON, GEORGE, in *Biography*, a diſſenting divine of conſiderable reputation for biblical learning, was born at Great Salkeld in Cumberland, on the 1ſt of September 1699. When he had finiſhed his preparatory ſtudies, he completed his education for the miniſtry at the univerſity of Glaſgow. At Abingdon in Berkſhire, where he firſt ſettled as paſtor in the year 1723, he continued for about ſeven years; and beſides a ſedulous attention to the duties of his office, he employed his time in a critical ſtudy of the ſacred writings. His firſt work, publiſhed during his reſidence in this town, was "A Defence of the Reaſonableneſs of Prayer," accompanied with a tranſlation of a diſcourſe of Maximus Tyrius, on the ſame ſubject, together with remarks upon it. A new edition of this, and of his piece on predeſtination, was publiſhed in 1737, under the title of "Two Letters to a Friend, &c." In 1729, he left Abingdon, and removed to the charge of a congregation in Southwark, with which he continued for eleven years. In 1731, he publiſhed "A Paraphraſe and Notes on St. Paul's Epiſtle to Philemon," in imitation of the manner of Mr. Locke; and to this he added "An Appendix, ſhewing that St. Paul could neither be an enthuſiaſt nor an impoſtor, and conſequently the Chriſtian religion muſt be, as he has repreſented it, heavenly and divine." This argument was afterwards illuſtrated and improved in the moſt maſterly manner by lord Lyttelton. This work, being favourably received by the public, was ſucceeded by Paraphraſes and Notes, after the ſame manner, on the two epiſtles to the Theſſalonians, the firſt and ſecond epiſtles of Timothy, and the epiſtle to Titus; together with diſſertations on ſeveral important ſubjects, particularly on inſpiration. In 1735, he publiſhed, in three thin volumes, 4to. "The Hiſtory of the firſt planting of the Chriſtian religion, taken from the Acts of the Apoſtles, and their Epiſtles, &c." A ſecond edition of this work, commonly bound up in one large volume, was publiſhed in 1756. In 1740, Mr. Benſon was choſen paſtor of the congregation of proteſtant diſſenters, in Crouched Friars, London, in the room of Dr. Harris; and in this connection, with the learned and candid Dr. Lardner as his aſſiſtant for ſome years, he continued till his death, which happened on the 6th of April, 1762. In 1743, he publiſhed his treatiſe "On the Reaſonableneſs of the Chriſtian Religion, as delivered in the Scriptures;" and in conſideration of his great abilities and learning, the univerſity of Aberdeen conferred upon him the degree of doctor in divinity. Dr. Benſon, having finiſhed thoſe epiſtles of St. Paul, on which he intended to write Paraphraſes and Notes, proceeded to explain, after the ſame manner, the ſeven catholic epiſtles, viz. that of St. James, the two epiſtles of St. Peter, that of St. Jude, and the three epiſtles of St. John. A volume of miſcellaneous ſermons, in 1747, was the laſt of his public works. His poſthumous writings, edited by Dr. Amory, appeared two years after his death, containing a life of Chriſt, and other theological eſſays. The labours of Dr. Benſon in ſacred literature met with a very favourable reception in foreign countries, as well as in Great Britain and Ireland, from the truly inquiſitive and learned, and introduced him to a friendly acquaintance and correſpondence with many perſons, eminent for their literature and rank in the eſtabliſhed church, as well as among the diſſenters. Of

these we may enumerate sir Peter King, lord chancellor of England; lord Barrington; archbishop Herring; bishops Hoadly, Butler, and Conybeare; Dr. Leland, and Dr. Duchal of Ireland; Dr. Jonathan Mayhew of New England; professor Michaelis of Gottingen; Dr. Wishart of Edinburgh; Dr. Watts of London; Dr. Taylor of Norwich; and Mr. Bourn of Birmingham. His commentaries and notes on the epistles are deservedly held in high estimation. The learned John David Michaelis, one of the professors in the university of Gottingen, proposed translating them into Latin, and in 1746, published his paraphrase on the epistle of St. James, with additional notes. Several of his other tracts were translated into German by M. Bamberger, a protestant divine at Berlin. As a zealous friend to religious toleration and free inquiry, and with a view of vindicating and recommending them, he published a defence of Servetus, and an account of archbishop Laud's persecution of Dr. Leighton. Biog. Brit.

Benson, in *Geography*, the north-westernmost township of Rutland county, in the state of Vermont, North America, is situated on the east side of lake Champlain, 57 miles N.N.W. of Bennington, and has 658 inhabitants.

BENTAVEO, in *Ornithology*, the French name of that species of Shrike, called *Lanius pitangua*, by Linnæus.

BENTENDORF Jeplitza, in *Geography*, a town of Hungary, 4 miles north east of Rosenberg.

BENT-GRASS, in *Botany*. See Agrostis.

BENTHAM, James, in *Biography*, was born at Ely in 1708, and educated for the church at Trinity college, Cambridge. After having held in succession several livings in the counties of Cambridge and Norfolk, he obtained, in 1779, a prebendal stall in the church of Ely, where he had an opportunity of cultivating his natural taste for church architecture and antiquities. The result of his observation and research was published under the title of "The History and Antiquities of the conventual and cathedral church of Ely, from the foundation of the monastery, A. D. 675, to the year 1771, illustrated with copper-plates," Cambr. 1771, 4to. The introduction to this work contains an account of Saxon, Norman, and Gothic architecture, and has been frequently cited as authority by later writers on these subjects. The grand repair of this church, entrusted to the superintendance of Mr. Bentham, afforded him an opportunity of investigating the principles upon which edifices of this kind were constructed, and suggested to him the idea of a general history of ancient architecture in this kingdom; and for this purpose he occasionally employed himself in collecting materials almost to the close of his life. He also interested himself in the improvement of his native country, by planning turnpike roads, and proposing the drainage and inclosure of parts of the Ely Fens; and some of his schemes were beneficially executed. In such useful occupations, and the faithful discharge of his professional duties, he protracted his life, by a course of temperance which his naturally tender constitution required, to his 86th year. He died Nov. 17, 1794. Gen. Biog.

BENTHEIM, in *Geography*, a county of Germany, in the circle of Westphalia, about 40 miles long, and from 12 to 15 broad. It is surrounded by the province of Overyssel and the bishopric of Munster, and abounds with wood, quarries of stone, game, and venison. The chief part of this territory is distributed into fertile corn-fields and beautiful meadows, which feed a great number of sheep and cattle; furnishing the inhabitants with an ample supply of the necessaries of life, and enabling them to make profitable exports. The principal river is the Vechte, which traverses the whole country. It is inhabited by Lutherans, Calvinists, and Roman catholics; and its traffic consists in linen, thread, wool, yarn, stone, wood, cattle, and honey. Its towns are Bentheim, Schuttorff, Northhorn, and Nienhus. In 1753, count Frederic Charles Philip, mortgaged this county to the house of Hanover, for an advance of money. The count of Bentheim or Benthein, has a seat and voice in the college of the Westphalian courts of the empire, and at the diets of the circle.

Bentheim, a town of Germany, and capital of the above county, is seated partly on an eminence, and partly on a river of the same name. It contains one Calvinist, and one Roman Catholic church. The castle or palace stands on a high rock north of the town, and is surrounded with towers. Bentheim is distant 26 miles N.N.W. from Munster, N. lat. 52° 21′. E. long. 7° 1′.

BENTHOORN, a town of Holland, 6 miles S.S.E. of Leyden.

BENTHULUD, a town of Africa, in the kingdom of Fez, at the foot of Mount Atlas.

BENTHUYSEN, a town of Holland; 6 miles south of Leyden.

BENTINCK, William, earl of Portland, in *Biography*, a favourite minister of king William III. was born in Holland, and descended from an ancient and noble family in the province of Guelderland He accompanied the prince of Orange to England in 1670, as gentleman of his bedchamber; and when the prince became stadtholder, he was promoted to the command of the favourite regiment of Dutch guards. In 1675, he manifested his attachment to this prince, by sleeping in the same bed with him when he had the small pox, in consequence of medical advice; and by thus exposing himself to the infection of a distemper with which he was actually seized, he laid the prince under an obligation, of which he was never unmindful. He took an active part in the preparations for the revolution in 1688, and in the progress of that event; and upon the prince of Orange's accession to the throne, he received many marks of royal favour. Sustaining several high offices near the king's person, he was naturalized, and in 1689, he was advanced to the rank of an English nobleman, with the title of baron of Cirencester, viscount Woodstock, and earl of Portland. In the following year, he acted as envoy to king William at the grand congress held at the Hague. The royal favour, however, by which he was distinguished, and particularly the grant of several lordships in Denbighshire, which were part of the demesnes of the principality of Wales, occasioned, in 1695, a warm opposition in the house of commons; but though this grant was revoked, in consequence of an address to the king, the earl was recompensed by other liberal grants from the crown, which constitute a great part of the present ample possessions of the family. This nobleman attended king William in his campaigns in Ireland and Flanders, and distinguished himself, as a military officer, on various occasions. After the conclusion of the peace of Ryswick, in the negotiation of which he had a principal concern, he was nominated embassador-extraordinary to the court of France, where he received the highest distinctions. On occasion of a jealousy, excited by the royal favour to a young Dutchman, named Keppel, afterwards earl of Albemarle, the earl of Portland resigned his posts in the king's houthold, and withdrew from affairs of state: but he still retained some portion of the king's esteem and confidence, and was entrusted with the administration of Scotland, and with the negociation of the famous treaty for the succession to the crown of Spain, called the "partition-treaty," which was afterwards the subject of an impeachment of the earl by the house of commons. The king's death, in 1701, terminated the earl of Portland's public life, and all hostilities against him. Of the attachment of his royal master, however, he had the most satisfactory evidence; when, on his death-bed, with his last words he inquired

inquired for him, and on his approach, laid hold of his hand and preſſed it to his heart. The cloſe of the earl's life was ſpent in retirement at Buſtrode, where he employed himſelf in acts of charity, and in the improvement of his fine gardens. He died Nov 23, 1709, in the 61ſt year of his age, and was buried in Weſtminſter Abbey. He left children of both ſexes by his two wives, Anne, daughter of ſir Edward Villiers, and Jane, daughter of ſir John Temple.

His temper was, like that of his royal maſter, grave, ſedate, and inclined to reſerve; and his demeanour ſomewhat loſty, without pride. Although he was an object of jealouſy and enmity, theſe were more national and political than perſonal; and his general character was that of an able and upright ſtateſman, connected with private virtue. Biog. Brit.

BENTIVOGLIO, Guido, *Cardinal*, was born of a noble family at Ferrara in 1579; and after having ſtudied at Padua with great reputation, he returned, in 1597, to his own country, where he diſplayed much dexterity in reconciling his brother, the marquis Hippolito, with cardinal Aldobrandini, the general of the church, and in concluding peace between the pope and Cæſar. Having finiſhed theſe tranſactions, he was appointed by pope Clement VIII. his private chamberlain, and allowed to complete his ſtudies at Padua. He then ſettled at Rome, and by his prudence and integrity acquired general eſteem. After having performed, from 1607 to 1619, the office of nuncio in Flanders; and alſo in France till the year 1621, he was raiſed to the dignity of cardinal by pope Paul V. He was alſo appointed by Lewis XIII. protector of the French nation in Rome; which office he declined on becoming biſhop of Terracina in 1641. On the death of Urban VIII. in 1644, he was thought to be the moſt proper perſon for the honour of ſucceeding him; but when he entered the conclave, in the hotteſt and moſt unhealthy ſeaſon of the year, he was ſeized with a fever, which terminated in his death on the 7th of September, at the age of 65. The principal of his works, which are held in high eſtimation, are his "Hiſtory of the Civil Wars in Flanders," written in Italian, and firſt publiſhed at Cologne in 1634, and ſince tranſlated into foreign languages; "Memoirs" of himſelf, an "Account of Flanders," and a collection of "Letters," reckoned the moſt approved ſpecimens of epiſtolary writing in the Italian language. Moreri. Gen. Biog.

Bentivoglio, in *Geography*, a ſmall town and fortified palace of Italy, in the ſtates of the church; 10 miles north of Bologna.

BENTLEY, Richard, in *Biography*, a very eminent critic, was born at Oulton, near Wakefield in Yorkſhire, on the 27th of January 1661-2, and after receiving the rudiments of claſſical learning at the free ſchool of Wakefield, was entered in his 15th year at St. John's college, Cambridge. In 1681, he left the univerſity, and became a ſchool-maſter at Spalding. From this ſituation he was ſoon removed to be preceptor to the ſon of Dr. Stillingfleet, dean of St. Paul's, who appointed him to be his domeſtic chaplain. In February 1691-2, he publiſhed his firſt work, which was a Latin epiſtle to Dr. Mill, containing "Critical Obſervations on Malala's Chronicon;" and about the ſame time he had the honour of being ſelected as the firſt perſon to preach Boyle's lecture, founded for the vindication of natural and revealed religion. The ſubject of the eight diſcourſes, which he delivered on this occaſion, and which were afterwards publiſhed and tranſlated into moſt of the modern languages of Europe, was the folly of atheiſm, or the confutation of this abſurd and joyleſs ſyſtem, from the faculties of the ſoul, from the ſtructure and origin of human bodies, and the origin and frame of the world itſelf. Whilſt he carried on this lecture, he maintained a philoſophical correſpondence with ſir Iſaac Newton, whoſe friendſhip he ardently cultivated, nor did he write any thing on this occaſion without this illuſtrious philoſopher's approbation. In 1692, he was inſtalled by biſhop Stillingfleet a prebend of Worceſter; and in the following year he was appointed keeper of the royal library at St. James's. In 1696, he was admitted to the degree of doctor of divinity; and he delivered a diſcourſe on the day of the public commencement from 1 Pet. iii. 15. It is ſaid, that he was ſoon after admitted, "ad eundem," in the univerſity of Oxford. His "Annotations on Callimachus," were inſerted in an edition of that poet, publiſhed in 1697, by Grævius; and in the ſame year Dr. Bentley himſelf publiſhed, at the end of Wotton's Reflections on ancient and modern learning, his "Diſſertations on the Epiſtles of Themiſtocles, Socrates, Euripides, Phalaris, and the fables of Æſop." This publication was ſucceeded by a literary controverſy, which engaged at the time a great degree of public attention. The immediate ſubject of this controverſy was the genuineneſs of the epiſtles of Phalaris. In order to give our readers ſome notion of its riſe, progreſs, and iſſue, we ſhall detail the following particulars. Soon after Dr. Bentley was made royal librarian, the honourable Mr. Boyle, who was about to publiſh an edition of the ſuppoſed epiſtles of Phalaris, applied, by means of a bookſeller in London, to Dr. Bentley, for the uſe of a MS. in the king's library, which, after much ſolicitation and delay, was at length obtained; but before the collation could be completed, and indeed, about ſix days after the manuſcript had been delivered, it was redemanded by Dr. Bentley, with many ſlighting and diſparaging expreſſions, both of Mr. Boyle, and the work. This conduct, Mr. Boyle, in the preface to his edition of Phalaris, publicly reſented; and in return, Dr. Bentley, in the above-mentioned diſſertation, endeavoured to evince the ſpuriouſneſs of the epiſtles that had been publiſhed, adding ſome reflections on Mr. Boyle's edition and verſion. In 1698, Mr. Boyle retorted, with effuſions of wit and perſonal abuſe, in a treatiſe entitled "Dr. Bentley's Diſſertation on the epiſtles of Phalaris, and the fables of Æſop examined," and commonly known by the title of "Boyle againſt Bentley," a ſecond edition of which was publiſhed in 1742. In 1699, Bentley recriminated in the ſame ſtyle, in a piece uſually denominated "Bentley againſt Boyle," reprinted in 1777, by Meſſrs. Bowyer and Nichols, with ſeveral notes and obſervations, collected from, or communicated by, biſhops Warburton and Lowth, Mr. Upton, Mr. W. Clarke, Mr. Markland, Dr. Salter, Dr. Owen, and Mr. Toup. Among the wits and critics, who united as auxiliaries of Boyle, were Swift, Pope, Garth, and Middleton; and it muſt be allowed, that they proceeded with an unwarrantable ſeverity in attacking the moral character and literary acquirements of their adverſary. Bentley, however, though unaided, ſuſtained the conteſt with unyielding firmneſs, and in the event with full ſucceſs, ſo far as the authenticity of the epiſtles aſcribed to Phalaris is concerned. Since prejudice and paſſion have ſubſided, it has been very generally acknowledged that Bentley had not only the evident advantage with reſpect to learning and argument, but that he is little, if at all, inferior to his antagoniſt in point of wit and ſmartneſs. The reputation of Dr. Bentley, during the progreſs of this literary ſquabble, was not very materially affected; for before its complete termination, he was preſented by the crown, in 1700, with the honourable and lucrative office of maſter of Trinity college, Cambridge; and in the following year collated archdeacon of Ely. In the former ſtation, he introduced reform, and curtailed ſalaries, and thus incurred the

the ill will of ſome of the ſenior members of the college; but as he appeared to have exerciſed an undue authority, and to have conſulted his own advantage more than the public, a charge was exhibited againſt him in 1709, by the vice-maſter, thirty of the ſenior fellows, and other members of the college, for peculation, breach of the ſtatutes, and other acts of mal-adminiſtration. The charge was preſented to the biſhop of Ely, as viſitor of the college. But Dr. Bentley contended, that the crown was the viſitor; and upon this a law-ſuit commenced, which was not terminated till the year 1731, when the crown aſſerted its viſitorial power, but declined interfering in the preſent inſtance. It appeared afterwards, that, upon the whole, the charges againſt the maſter were well founded.

In 1710, Dr. Bentley publiſhed at Amſterdam his critical annotations on the two firſt comedies of Ariſtophanes; and, about the ſame time, at Rheims, his emendations of the fragments of Menander and Philemon, under the feigned name of "Phileleutherus Lipſienſis." This latter was undertaken with the view of diſparaging a ſimilar performance of Le Clerc, and thus by degrading his literary character in the public eſtimation, to ſet aſide a ſcheme, which was then in agitation, for inviting him to England, by the offer of ſome conſiderable church preferment. In the year 1711, he publiſhed his long expected and much commended edition of "Horace." This correct and elegant edition of Horace, which was pronounced by Dr. Hare to be the compleateſt work produced by criticiſm ſince the reſtoration of learning, was printed in 4to. and dedicated to the earl of Oxford. It was ſucceeded, in 1713, by ſome excellent remarks on Collins's diſcourſe of free-thinking, publiſhed under the former name of "Phileleutherus Lipſienſis," and dedicated to Dr. Hare. In 1716, Dr. Bentley was appointed regius profeſſor of divinity; and in the ſame year he circulated propoſals for a new edition of the Greek Teſtament, with St. Jerom's latin verſion. Theſe propoſals were the ſubject of ſevere animadverſion by Dr. Middleton, who profeſſed a ſerious conviction, that Dr. Bentley had neither talents nor materials proper for the work, and that religion was much more likely to receive detriment than ſervice from it. Several pamphlets were publiſhed on the occaſion; and it is much to be regretted, that a work of ſuch importance to ſacred literature and biblical criticiſm was abandoned. The completion of this noble undertaking was the principal employment of the latter part of Dr. Bentley's life. In the proſecution of it he had collected and collated all the MSS. of Europe to which acceſs could be obtained; and for this purpoſe, his nephew, Thomas Bentley, L.L.D. well known in the republic of letters, had travelled through Europe at his uncle's expence; the whole was completed for publication; but when he determined not to let it appear during his own life, the ſum of 2000l. which he had received in part of the ſubſcriptions, was returned to the ſubſcribers. A circumſtance occurred in 1717, which materially affected the doctor's reputation, and which was attended, at leaſt for a time, with detrimental conſequences to himſelf. Upon the creation, by royal mandate, of ſeveral doctors in divinity, Dr. Bentley demanded from each of them, beſides the cuſtomary perquiſite, an extraordinary fee of four guineas. In this demand they acquieſced, on condition that the money ſhould be reſtored, if it ſhould appear that Dr. Bentley had no right to enforce it. Dr. Middleton, however, ſome time after, obtained a decree for the repayment of the money; and in conſequence of this decree, Dr. Bentley was arreſted, and appeared by his proctor before the court of the vice-chancellor. On this occaſion, the beadle teſtified on oath, that Dr. Bentley had declared, "I will not be concluded by what the vice-chancellor and two or three of his friends ſhall determine over a bottle;" and for this expreſſion he was ſuſpended by the vice-chancellor, without a citation or hearing, from all his degrees, and afterwards by the caput deprived of all his privileges and honours, as well as degrees, in the univerſity. Dr. Bentley appealed to the king, and after ſucceſſive references to the council and to a committee of council, and to the court of king's bench, and many delays, the univerſity received a mandamus in February 1718, which reverſed all their proceedings, and required a reſtoration of Dr. Bentley to all degrees, honours, &c. of which he had been deprived. In 1726, he publiſhed an edition of "Terence and Phædrus;" and in 1732, the laſt of his works, which was his edition of "Milton's Paradiſe Loſt;" and which made no addition to his reputation, though it has been ſaid that many of his corrections of that poet have been unreaſonably objected to by biſhops Pearce and Newton. This work was undertaken at the requeſt of queen Caroline. Dr. Bentley died on the 14th of July 1742, in the 81ſt year of his age, and was buried in the chapel of Trinity college. When we conſider the unqueſtionable abilities and erudition of Dr. Bentley, it may excite ſome degree of ſurpriſe, that his literary character ſhould have been held in much higher eſtimation by foreigners, than by his own countrymen. This may be partly owing to that pride, petulance, and irritability of temper, with which he, in common with many others who have excelled in verbal criticiſm, ſeems to have been chargeable; to the perſonal diſputes in which he was engaged; and to the political differences that diſquieted the period in which he lived. But, perhaps, it aroſe principally from his having, in the claſs of his adverſaries, the poets and wits of the age, and from their having made him the object of their ſatire and ridicule. The aſperity of Mr. Pope, who attacked him in the character of Ariſtarchus (works, vol. iii. p. 207—211.) has, however, been aſcribed to perſonal reſentment. Whilſt they were both together at dinner with biſhop Atterbury, Dr. Bentley was queſtioned as to his opinion of the Engliſh Homer; and, after ſome demur, being urged to ſpeak out, he ſaid "the verſes are good verſes, but the work is not Homer; it is Spondanus." Another circumſtance, which contributed to degrade Dr. Bentley in the eſtimation of ſome of his contemporaries was that love of money, which he ſeems to have unduly indulged, and which involved him in diſputes that were diſhonourable to him. As to the charge of ſcepticiſm, with reſpect to revelation, alleged againſt him by Mr. Whiſton, it does not appear to have been well founded. Dr. Salter deſcribes him as having been a very amiable and pleaſant man in private life, and as poſſeſſing much good nature, though he has been otherwiſe repreſented. Againſt the diſparaging judgment of the learned biſhop Lowth, who allows him to rank only among grammatical and verbal critics, may be contraſted the encomium of Dr. Samuel Clarke, eminently diſtinguiſhed by his literature and critical diſcernment, who, in the preface to his edition of Cæſar's Commentaries, ſpeaks of him as "vir in hujuſmodi rebus peritiâ plane incredibili et criticos omnes longé longéque judicio et ſagacitate antecellens." The judgment of poſterity, more impartial than that of his contemporaries, has allowed Dr. Bentley's profound ſkill in the idiom of the Latin and Greek languages; and though, as a verbal critic, many of his emendations are unſanctioned by the authority of ancient MSS. they frequently approve themſelves as juſt and reaſonable, and are regarded as real improvements. It muſt be acknowledged, however, that thoſe corrections of ancient and modern authors, which depend upon mere conjecture, and which ſuggeſt what might, or ought to have been written, rather than what

what they actually did write, extend the province of criticism beyond its just limits: and whilst they afford scope for the unwarrantable exercise of fancy or judgment, they should be very cautiously admitted. In this way doctor Bentley is said to have incurred the charge of temerity and presumption. The son of Dr. Bentley, who was called after his own name, was a gentleman of acknowledged ingenuity, taste, and learning, and known as the author of several publications, and particularly of a tragedy, entitled "Philodamus," published by Dodsley in 1767, and esteemed by the late eminent poet Mr. Gray, as one of the most capital poems in the English language. His youngest daughter married a grandson of the learned Dr. Cumberland, bishop of Peterborough, whose famous book, "De Legibus Naturæ," Dr. Bentley is said to have corrected upon a visit to his son-in-law, who was bishop of Kilmore in Ireland. The son of this bishop, Richard Cumberland, esq. is well known by his ingenious writings, and especially by his justly applauded dramatic pieces. Biog. Brit.

BENTOT, in *Geography*. See CALTURA.

BENVORLICH, a mountain of Scotland, in the county of Perth; 3300 feet high. See GRAMPIAN MOUNTAIN.

BENY, a town of France, in the department of the Calvados, and the district of Caen, 2½ leagues N.N.W. of Caen.

BENY-*Bocage, Le*, a town of France, in the department of the Calvados, and chief place of a canton, in the district of Vire, 7½ leagues S.W. of Caen. The place contains 704, and the canton 13,941 inhabitants; the territory includes 175 kilometres and 21 communes.

BENY, a small town of Hungary, in the county of Zempling, seated on the river Bodrog, and noted for its excellent wine, not inferior to Tokay.

BENYOWSKY, MAURITIUS AUGUSTUS, *Count de*, in *Biography*, magnate of the kingdoms of Hungary and Poland, a singular adventurer, was born at Verbowa, in the country of Nittria, in Hungary, in the year 1741, and educated for military service, to which he devoted himself from his youth. Being wronged in his paternal inheritance by his family, he seized by force the castle which was his father's residence; in consequence of which he was deprived of his whole property by a decree of the chancery at Vienna, and was obliged to fly for refuge into Poland. Here he engaged, in 1767, in the conspiracy against king Stanislaus, and in the course of this irregular service he was taken prisoner, first in 1768, and afterwards in 1769, by the Russians, who treated him with severity, because he had violated his parole, and because he was forming plans for the liberation of himself and his companions. The Russians conveyed him to Casan, where he was allowed to live at large, under the notice of the garrison, as a state-prisoner; but here his enterprising disposition recommended him to a party, which was then forming a conspiracy against the Russian government, in the execution of which he was invited to associate. But the plot being discovered, he was exiled to Siberia; and after a tedious journey and voyage of twelve months, during which the count made some unsuccessful efforts for escaping, he arrived on the 2d of December 1770, at Kamtschatska, and was conducted to the town called Bolsoretzkoy Ostrog, or Bolcheretsk, where he and his companions in exile were informed that they must provide for themselves, and where they were furnished for this purpose with the necessary arms and implements. Dissatisfied with this prescribed mode of savage life, the count soon began to concert measures with his fellow-prisoners for their escape; and in the mean time, he improved his circumstances by opening a school, in which he educated the son and three daughters of the governor, M. Nilow, or Nilloff, and by his knowledge of the game of chess, at which he played with some merchants, on behalf of the Hettman of the Cossacks, who allowed him a certain proportion of the sums which he won. Having gained the confidence of the governor and the affections of Aphanasia, one of his daughters, he proceeded in maturing and accomplishing his plan of liberation; but before its execution, the secret was discovered, and the force of the settlement was employed in reducing the malcontents. In the conflict on this occasion, the governor was killed; but the exiles at last succeeded, secured a vessel, and, accompanied by Aphanasia, who chose to follow the count, took their final leave of Kamtschatska. Their whole number, including the exiles, women, and the ship's crew, amounted to 96 persons. After enduring many naval hardships at sea, the vessel arrived at Japan; and on the 14th of August 1771, he anchored on the island of Usmey Ligon, which he places in N. lat. 29°, and which must consequently lie between Japan and the island of Lekeio. This island, according to his account, is absolutely independent both of China and Japan; its inhabitants are mild, virtuous, and in a high state of civilization; and they are said to have been converted to Christianity by a Portuguese missionary Jesuit, Ignatio Salis, who arrived in the island in 1749. Upon quitting this island, whither he promised to return, he sailed for Formosa, and arrived there on the 27th of August; but meeting with an opposition on his landing, he made a great slaughter among the natives. At length he opened, by means of a Spaniard, who resided on the island, a more friendly intercourse with the inhabitants of another canton, and assisted Huapo, their prince, in a war against one of his neighbours. After a stay of about sixteen days on this island, he departed and steered for Macao, in the harbour of Canton, in China. Here his female companion, Aphanasia Nilow, died. During his stay in this place, he made some attempts for procuring leave to go to Canton; but when these proved ineffectual, he determined to sail for Europe. Accordingly, in his way thither, he arrived at the isle of France, March 16th 1772, and having touched at the isle of Madagascar, he landed in France in July, and was well received by the French ministry.

Of the proposals made to the ministers of France by this adventurer, we have no documents; but he seems to have been regarded by them as a fit person to be employed in establishing a settlement in the island of Madagascar. With this view they furnished him with a body of troops, in 1773; and in his way thither he touched at the isle of France, in order to solicit the co-operation of the chiefs of that island. Jealousy, and the dread of a rival settlement, prevented his obtaining their concurrence; and therefore, after some delay, he proceeded to Madagascar, and landed there in February, 1774; forming his settlement at the bottom of the bay of Antongill, at the mouth of the river Fingballe. The count made little progress in accomplishing the object of his mission, although he expended on account of the French government a sum amounting to 50,000*l.*, and therefore, towards the end of the year 1776, commissioners were deputed to examine the state of the settlement, and to convey the count to France. In the mean time, this enterprising adventurer had contrived to raise himself to consequence in the island by a curious stratagem. The Sambarives, constituting one of the distinct nations of Madagascar, had been formerly governed by a chief, whose name was Ramini; and as he had left only one daughter, who had been taken prisoner and sold to foreigners, his family was supposed to be extinct. Of this circumstance the count artfully availed himself; and obtaining the testimony of an old negroe woman whom he had brought with him from the isle

isle of France, who declared that she knew him to be the son of Ramini's daughter, her own companion in slavery, he succeeded in his views of being publicly acknowledged as the heir of Ramini. Under this character he was vested with sovereignty, formed alliances with other tribes, made war and peace, and received submissions from the vanquished. But as his European resources were with-held, he renounced the service of France, and persuaded his subjects to permit him to return to Europe, for the purpose of forming an alliance with France, or some other power, and for making commercial arrangements with a view to the improvement of a settlement on the island. Accordingly, he departed for Europe in November 1776, on board a brig which he had freighted to the Cape of Good Hope. With this event his own narrative terminates. Among his state papers, however, we find his proposal to the king of Great Britain, dated Dec. 25, 1783; of which the preliminary article is his being acknowledged sovereign of the island of Madagascar; under which character he offers terms for an offensive and defensive alliance with this country. But it appears, from a declaration prefixed to this paper, that he had previously applied, probably with similar views, to the emperor of Germany. The application to the British ministry, if it was ever made, and if it was ever the subject of discussion, as some have asserted, was not attended with success. The count, therefore, determined to return to Madagascar with such supplies as he could obtain from individuals; and having procured goods and merchandize in London to the amount of 4000l. and finding it difficult to get the flag of any European power to sail beyond the Cape of Good Hope, he departed for Maryland in America, in April 1784. A respectable commercial house engaged in his undertaking, and supplied him with a vessel and goods to a considerable amount. In this vessel he sailed for Madagascar; and after escaping the hazard of shipwreck on the lee shore of America, and doubling the Cape of Good Hope, he touched at Sofala, and on the 7th of July 1785, anchored in Antangara bay, 10 leagues S.W. of cape St. Sebastian, in Madagascar, where the cargo was landed. Under an apprehension that the count had been cut off by the natives, the party on board the ship set sail for the island of Joanna, and at Oibo, on the opposite continent, sold the ship. The count heading a body of natives, commenced hostilities against the French by seizing their store-house at Angoutzi. Here he began to build a town after the manner of the country, and from thence he detached 100 men to seize their factory at Foul Point, who desisted on seeing a frigate at anchor. In consequence of these transactions, M. de Scullac, governor of the isle of France, sent a ship with sixty regulars, who landed, and attacked the count on the 23d of May 1786, in a redoubt which he had constructed, mounting two cannon, and in which he, with two Europeans, and thirty natives, waited their approach. The blacks fled, and Benyowsky, receiving a ball in his breast, fell behind the parapet, whence he was dragged by the hair, and soon expired.

Whilst none can question the ability and bravery of count Benyowsky, the principles of his conduct are not easily ascertained. His enemies represent him as a tyrant and a robber; and his friends, on the contrary, exhibit him as distinguished by a noble, humane, and generous disposition. Mr. Nicholson, the editor of his "Memoirs and Travels," who had all the letters and documents before him, declares, that he has "not yet seen any thing against the count, which will not bear two interpretations, or which has not been written by men who contradict each other, and had an interest in traducing him." "His conduct in Madagascar," says Wadstrom, in his "Essay on Colonization," "deserves no small portion of admiration, and even of respect; and, all things duly considered, I see no reason, why a monument might not be erected to his memory, inscribed "MAGNIS TAMEN EXCIDIT AUSIS." A very different character is given of him by M. de Lesseps, in his "Travels in Kamtschatska;" who represents him as perfidious and cruel, and by the Abbé Rochon, in his "Voyage a Madagascar, &c." who says, "that he aimed at the conquest of Madagascar by fire and sword, and treated the natives with such cruelty, that he was called by no other name by them than the "Wicked White." Memoirs and Travels of count Benyowsky, written by himself, 2 vols. 4to. 1790.

BENZELIUS, ERIC, a learned Swedish divine, was born in 1642, in Westro-Gothland, and educated under the patronage of a rich uncle at Upsal. He was first preceptor to the sons of the count de la Gardie, chancellor of Sweden; and having completed their education, he travelled through various parts of Europe, cultivating an acquaintance with the learned, and consulting the principal libraries. Upon his return to Upsal in 1665, he was appointed professor of history and morality in the university, and afterwards promoted to the theological chair, and to a seat in the consistory. In 1675, he was made doctor in theology; in 1677, bishop of Strengnes; and, in 1700, archbishop of Upsal, occupying also the vice-chancellorship of the university. He died in 1709; and was the author of several dissertations on the lives of the patriarchs, and other parts of ecclesiastical history. He wrote also various theological works, and translated the whole Bible into the Swedish language. Moreri.

BENZELIUS, ERIC, son of the former, was born at Upsal in 1673, where he began and completed his studies. Having travelled into Germany, England, and France, he returned to Upsal in 1702, and was appointed librarian to the university, an office which he held for 22 years. In 1724, he was nominated professor of divinity; and afterwards successively created bishop of Gotheborg, Lindkioping, and archbishop of Upsal. He died in 1743. Benzelius undertook, in conjunction with other learned men, a review, as well of all books published in Sweden, or by Swedes abroad, as of those works printed in other countries, which had any relation to this kingdom. This publication, containing, besides reviews, some few original acts, was denominated "Acta Literaria Sueciæ," and conducted for 10 years on this plan by a society of gentlemen, who afterwards formed the royal society of Upsal. See SOCIETY.

BENZIE ISLAND, in *Geography*, lies on a river of the same name, within Sierra Leone, on the coast of Africa.

BENZOE, in *Botany*. See CROTONA.

BENZOIN. See LAURUS.

BENZOIN, *Benjamin Gum*, and *Benzoic Acid*, in *Chemistry* and *Pharmacy*.

The gum benzöin or benzöe, by some called also *Asa Dulcis*, is a very fragrant resin, procured from a large tree found in many parts of the East Indies, Sumatra, Arabia, Persia, &c. See STYRAX *Benzöe*.

The resin is brought in large brittle masses of a light yellow, interspersed with white nodules, which last are considered as the finest, and called by some *Benzöe Amygdaloides*. The smell of Benzoin is extremely fragrant, especially when rubbed or heated: it has scarcely any taste, except previously dissolved in spirit of wine, which it does with ease, into a yellowish tincture. On adding water to this tincture, the resin again separates into a white pulverulent mass, which has received the singular name of *Lac Virginale*, and also *Magistery of Benzoin*. When gently dried, it forms a white powder, formerly in great request as a cosmetic. It is at least innocent, and its scent is one of the most agreeable. But the most striking ingredient of this resin is the

Benzoic Acid, which is of sufficient importance to require being

being described more at large. If benzoin is gently heated a little above the degree of boiling water, it melts into an adhesive mass, and at the same time sends out a very copious, dense, white fume, of an extremely fragrant, diffusive, penetrating smell, and so acrid as irresistibly to excite coughing and tears in those who are in any degree exposed to it. This fume soon condenses on the first cool body, and then appears in the form of very beautiful spicular crystals, which gradually collect into a bulky feathery mass, extremely light, and of remarkable elegance and lustre. This crystalline mass is the benzoic acid, and its acid property is proved by reddening litmus, neutralizing alkalies, and forming with them peculiar salts; in modern chemical nomenclature called *Benzoats*. After the greater part of the acid has risen by sublimation, or before it, if the heat be at all increased, a thin yellowish oil rises slightly empyreumatic, but strongly imbued with the fragrance of the resin. On further heating, an acidulous liquor comes over, together with a thick butyraceous matter; still, however, containing some of the crystallizable acid, which is not totally expelled till the end of the process.

This acid is readily soluble in alcohol, and in hot water, but so sparingly in cold water, that a hot saturated solution will deposit in crystals almost its saline contents by cooling.

Several methods have been devised for obtaining the benzoic acid. The oldest and most expeditious is by simple sublimation. To procure any quantities of it, put benzoin in an earthen pipkin; apply to the vessel a large cone of clean white paper, pasted down to the edges of the pot, and set it over an extremely slow charcoal, or other fire, just sufficient to melt the benzoin. The acid will rise and crystallize upon the inside of the paper cone. However, as in this method the vapour has hardly room to concrete, instead of the paper cone, another vessel inverted over that which contains the resin, and with a small hole drilled through its bottom, may be substituted; and when full, it may be gently shaken, to detach the acid, and again applied. From nine to twelve drachms may be thus obtained from sixteen ounces of benzoin. The remaining resin is still very aromatic, and should not be lost.

Another method has been recommended by Scheele, who in his excellent practical observations upon this salt, has treated it with that precision and ingenuity which so eminently distinguish this chemist in every subject, of greater or less importance and difficulty, which he has illustrated by his labours.

He observes, that besides sublimation, the acid may be extracted by lixiviation, and with the advantage of obtaining it free from any admixture of oil, which is apt to impair its whiteness and lustre. If benzoin is boiled with water, and the solution strained while hot, and suffered to cool, most of the acid taken up by the hot water deposits when cold, and may then be collected pure. This method, however, is imperfect; for as the water does not mix with and divide the gum, this last soon softens, and sinks down, closely adhering to the bottom of the vessel, and does not allow the water easily to penetrate it. Hence the solution takes place only at the surface of the benzoin.

The same chemist boiled powdered chalk and benzoin in water, and filtrated the liquor. No crystals were now deposited on cooling, for the acid had dissolved part of the chalk into a benzoat of lime, which, being very soluble, remained in the liquor. But on adding some drops of vitriolic acid, the benzoic acid was again separated from the lime, and fell to the bottom in a powdery form. Substituting alkali for the chalk, the same effect took place, and the benzoic acid, as before, was precipitated by the vitriolic. But this method was still attended with the inconvenience of the benzoin concreting together, which floated on the surface during the boiling. But on substituting quick-lime this inconvenience was avoided; and it is therefore in the following method that the benzoic acid may be procured the most copiously and the purest. Upon four ounces of unslacked lime pour twelve ounces of water, and after the ebullition is over, add six pounds more of water; then put a pound of benzoin, finely powdered, into a tin pan; pour on it at first about six ounces of the above lime water; mix them well together, and then successively the rest of the lime water. By this method the resin will be prevented from running together into one mass. Boil the mixture for half an hour, with constant stirring, then let it stand, and pour off the clear liquor. On the remainder in the pan, pour more lime water, and proceed as before, adding the clear liquor to that first obtained, and also filter the residue, to exhaust the liquor, which is now a weak solution of benzoic acid, with the lime of the lime water. Boil down this liquor (which is of a light yellow) to two pounds, and strain. When cold, add to the liquor muriatic acid gradually, which will produce a white crystalline deposition, and continue to add the acid till the liquor is supersaturated, and tastes sourish. The stronger acid thus unites with the lime, and the benzoic acid, now free, being of itself scarcely soluble in cold water, falls down as a white coagulum, which should be washed with more cold water, and gently dried. To give it a crystalline appearance, dissolve it in boiling water, filter it through a cloth, and by cooling it will separate in the form of spicular crystals, but with some loss of the acid.

The above process of Scheele's may however be a little shortened, if the lime in substance be mixed with the lime water, previous to the addition of the benzoin; for by this method the solution may be at once made more concentrated, and less of the liquid will suffice, so that much of the evaporation will be saved. Any of the stronger acids will displace the benzoic from lime, but the muriatic is the most convenient.

Scheele obtained from 12 to 14 drachms of the concrete acid from a pound of benzoin by this process.

The benzoic acid, when pure, is quite white; for if yellow, it is mixed with a small portion of the oil of the resin. Though crystallized, it is considerably elastic, and difficult to be reduced to powder. Its taste is sharp, pungent, and acidulous. It reddens tincture of litmus. When cold, it is without smell, but on applying heat it sends forth the peculiar grateful odour by which it is characterized. Heated by itself, it chiefly sublimes, but a part is decomposed, giving an acid phlegm, much oil, and carburetted hydrogen gas. It is not alterable in the air, and does not evaporate by keeping in a moderate temperature. Cold water dissolves only about $\frac{1}{300}$ of its weight, but boiling water $\frac{1}{25}$; and hence the copious crystallization from a hot water solution. It unites readily to most of the alkalies and earths forming benzoats, the properties of which have been but little examined.

The benzoat of lime is almost the only salt of this kind found native. It is contained in the urine of some animals, particularly the herbivorous quadrupeds, and is ascertained by adding to this secretion some muriatic acid, by which the benzoic acid is made perceptible.

With potash this acid forms a readily crystallizable salt, decomposable, like the rest of the benzoats, by a strong acid.

Most of the metallic oxyds are dissolved by this acid, but not the pure metals.

Mr. Hermbstadt, in a series of experiments on the action of nitrous acid on the benzoic, found that the latter regularly assumed in the process a smell like that of water distilled over bitter almonds, but on the whole, this acid is but with difficulty

culty altered in its nature by the nitrous. Diſtilling the nitro-benzoic acid with pure alcohol, he obtained ethereal liquor, part of which was nitrous ether, but the remainder appeared, by the ſmell of almonds, to be a dulcified, or ethereal benzoic acid. But theſe experiments require to be repeated with accuracy, as the powerful operation of the nitric acid on vegetable matter, though highly inſtructive, is often not a little embarraſſing.

Several other ſubſtances, beſides the reſin of benzoin, contain more or leſs of this acid. The balſam of Peru, and of Styrax, appear to owe to this acid much of their fragrant ſmell. Ambergris, vanilla, and ſome of the aromatic barks, and even urine, contain a ſmall quantity of it. When uncombined with an alkaline or earthy baſe, it is generally known by a pungent fragrant ſmell, and denſe white ſmoke, on applying a heat leſs than is neceſſary to burn or decompoſe the ſubſtance with which it is united. When kept down by an alkali or an earth (as in the caſe of urine), it is ſeparated by a ſtrong acid. It has been ſuppoſed, with probability, that the fragrant ſcent is not proper to the acid, but is owing to the preſence of a portion of reſin or eſſential oil, combined with it ſo intimately as to be inſeparable by any means hitherto known, without entire decompoſition of the acid; and hence too may be explained the very weak affinity of this acid for all baſes, which is generally ſuperior to no acid but the carbonic.

Gum benzoin is almoſt diſuſed in medicine, though ſtill retained in a few preparations of the London and Edinburgh pharmacopœias. The compound tincture *Tinctura Benzöes Compoſita*, formerly *Balſamum Traumaticum*, contains gum benzoin, balſam of Tolu, and aloes; and the benzoic acid enters into the Edinburgh *Tinctura Opii Ammoniata*, and in ſome other compounds of foreign diſpenſaries.

The fragrance of this reſin has cauſed it to be uſed in fumigations of various kinds. Where the object is merely to produce a penetrating agreeable ſcent, it may be of conſiderable uſe; but as a *corrective* of foul or contagious air, its powers are very ſmall, by no means comparable to thoſe of the mineral acid vapours, while the irritation which it gives to the lungs is more intolerable. Scheele's Eſſays. Fourcroy. Hermbſtadt in J. Phyſ. tom. 34, &c.

BEOLIPA Gulf, in *Geography*, lies on the eaſt ſide of the ſtrait of Dardanelles, near the opening into the ſea of Marmora.

BEORI Animal (*Laët. Amer.*), in *Zoology*, the *Tapir Americanus* of Gmelin, &c.

BEOSTER Island, in *Geography*, one of the Shetland iſlands, between which and Green iſland, at the north end of Braſſa, or Braſſy ſound, is a good channel, that runs out into the ſea.

BEOTIA, Cape, lies within the iſland of Negropont, to the north of Corinth, on the north ſide of the peninſula, ſtretching ſouth-eaſt from Corinth.

BEQUIA, a ſmall iſland of the Weſt Indies, dependent on the government of St. Vincent, and containing 3,700 acres. It is chiefly valuable from the commodiouſneſs of its fine harbour, called "Admiralty bay."

BER, a diſtrict of Swiſſerland, in the government of Ælen and canton of Bern, comprehending two parochial villages.

Ber. See Berbice.

BERA. See Boele-Comba.

BERABZAN, a long lake in New North Wales, lying N. and S. and running gradually from its north end, till it mixes with the waters of Schecharas lake, at the ſouth end, and where theſe waters form Seal river, which empties into Hudſon's bay, at Churchill fort. The north end of Berabzan lies in about 60° 30′ N. lat. and 93° 50′ W. long.

BERÆA, in *Ancient Geography*. See Beroea.

BERAMS, in *Commerce*, a coarſe cloth, made altogether of cotton thread, which is brought from the Eaſt Indies, and particularly from Surat.

BERAMUN, in *Geography*, a town of Egypt, on the Nile; 3 miles north-eaſt of Manſora.

BERAR, a ſoubah, or kingdom of Hindooſtan, bounded on the north by Allahabad and Malwa; on the weſt by Candeiſh and Amednagur; on the ſouth by Tellingana and Golconda; and on the eaſt by Oriſſa. It contains 13 circars, divided into 42 pergunnahs. The weſtern parts of this province were reduced by Acbar; and its revenue under Aurungzebe, as ſtated by Mr. Fraſer, in his "Life of Nadir Shah," amounted to 153½ lacks of rupees. The principal part of this province is poſſeſſed by the Berar or Nagpour rajah; and the remainder is held by the Nizam, or ſoubah of the Deccan, who pays to the rajah a "chout," or fourth part of its clear revenues. The interior parts of Berar are leſs known than moſt other countries in Hindooſtan; but it is thought to be neither populous nor rich. Its preſent capital is Nagpour, about midway between Bengal and Bombay. This province produces wheat, rice, poppies, and many ſorts of legumes. In the ſouthern part is found the deer, which yields the Bezoar ſtone; and the ſheep of this province differ from the common ſpecies, their neck being lengthened, their tail very ſhort, their ears long, and their wool not curled.

BERARDI, Angelo, in *Biography*, an Italian writer on muſic, who publiſhed at Bologna a conſiderable number of muſical tracts, between the years 1681 and 1693, which, with a large portion of pedantry and common-place information, contain much curious and uſeful knowledge. Their titles are: "Ragionamenti Muſicali, Muſical Diſſertations;" "Documenti Armonici, Harmonical Documents;" "Miſcellanea Muſicale, a Muſical Miſcellany;" "Arcani Muſicali, Dialogo, Muſical Arcana, a Dialogue;" and the "Perche Muſicale, Muſical Definitions." If the whole had been compreſſed, methodiſed, and digeſted into a ſingle treatiſe, and all the muſical information diſperſed through theſe ſeveral tracts arranged in a regular and gradual order, a more uſeful and practical didactic work might have been produced, than Italy ſeems to have furniſhed during the 17th century.

BERASTEGUE, in *Geography*, a mountain of Spain, in the province of Guipuſcoa, 3 leagues from Toloſa.

BERAULT, Nicholas, in Latin *Beraldus*, in *Biography*, one of the learned men of the ſixteenth century, was either a native of Orleans, or for a long time reſident in this place, where he was profeſſor of the civil law. He was tutor to admiral de Coligni; and well acquainted with Eraſmus, who, in his "Ciceronianus," ſpeaks with commendation of his eaſy and flowing elocution, and who, in 1522, dedicated to him his treatiſe, "De Conſcribendis Epiſtolis." Among the Latin works of Berault, were "A Græco-Latin Dictionary," Paris, 1521; an "Oration on the Peace of Cambray," Paris, 1528; another "On ancient and modern juriſprudence," Lyons, 1533; and "A Dialogue on the faculty of ſpeaking extempore," Lyons, 1534. He alſo wrote paraphraſes on the Politics and Œconomics of Ariſtotle, and notes on the Ruſticus of Politian. His comments on the Natural Hiſtory of Pliny, though not mentioned by Hardouin, are much commended by Eraſmus. He was eſteemed for his integrity, and greatly regarded by Poncher, archbiſhop of Sens, a prelate diſtinguiſhed in France by his patronage of literature.

BERAUN, in *Geography*, a royal borough of Bohemia, in a circle of the ſame name. The chief produce of the circle is wood and corn, and in ſome parts are found mines of iron.

iron. The town is ſeated on the river Mies or Miza; 14 miles S.W. of Prague. N. lat. 50° 2′. E. long. 14° 25′.

BERBECZ, a river of European Turkey, which runs into the Birlet, near Tecuczi, in the province of Moldavia.

BERBEGAL, a town of Spain, in Aragon 3 leagues from Balbaſtro.

BERBERES. See Berbes.

BERBERINA, in *Entomology*, a ſpecies of Tipula, with ſooty, incumbent wings, having the baſe and marginal ſpot white. Schrarck. This inſect has the thorax and abdomen red; it feeds on the berberry, and forms ſmall ſtrumous excreſcences on the branches.

Berberina, in *Natural Hiſtory*, a ſpecies of Vorticella, of a ſimple oval form, with a branched rigid ſtem, and white granulations. Gmelin. This is Vorticella compoſita, floribus ovalibus muticis, ſtipe ramoſa of Linn. Syſt. Nat. edit. 12. It is alſo Brachionus berberiformis of Pallas; and Pſeudopolypus beriformis of Rœſel. Found in freſh water in Europe; uſually in cluſters.

BERBERIS, *Barberry*, or *Pipperidge Buſh*, in *Botany*. Linn. gen. n. 442. Schreb. 505. Reich 476. Juſſ. 286. Gærtn. t. 242. Tournef. 385. Smith 181. Claſs and Order. *Hexandria Monogynia*. Gen. Char. *Cal.* perianth ſix-leaved, patulous; leaflets ovate, with a narrower baſe, concave, alternately ſmaller, coloured, deciduous. *Cor.* petals ſix, roundiſh, concave, erect-expanding, ſcarcely larger than the calyx; nectary two, ſmall, roundiſh, coloured bodies, faſtened to the baſe of each petal. *Stam.* filaments ſix, erect, compreſſed, obtuſe; anthers two, faſtened on each ſide to the top of the filaments. *Piſt.* germ cylindric, the length of the ſtamens; ſtyle none; ſtigma orbiculate, broader than the germ, ſurrounded with a ſharp edge. *Per.* berry cylindric, obtuſe, umbilicated with a point, one-celled. *Seeds* two, oblong, cylindric, obtuſe. B. *cretica* has three ſeeds. Reich.

Eſſ. Char. *Cal.* ſix-leaved; *pet.* ſix, with two glands at the claws; *ſtyle* none; *berry* two-ſeeded.

Species, 1. B. *vulgaris*, common barberry; B. dumetorum. Ray, Sin. 465. Spina acida or oxycantha. Ger. Em. 1325. β. B. *violacea*, purple-fruited barberry. γ. B. [illegible], Canada barberry. "Peduncles racemed, ſpines triple." A ſhrub riſing to the height of 8 or 10 feet; with ſtems upright and branched, ſmooth, and ſlightly grooved, brittle, with a large white pith, and covered with a whitiſh or aſh-coloured bark, yellow on the inſide; ſtems and branches are armed with ſharp thorns, commonly growing by threes; firſt leaves obovate, ſerrate ciliate, not jointed; ſtem-leaves alternate; ſecondary leaves in pairs, oblong, and ſerrate, with ſmaller leaves concealed between the lowermoſt leaves and the thorns; flowers towards the ends of the branches in pendulous racemes, with a bractea to each pedicel; corolla yellow; petals frequently ſerrate about the edge, and at the baſe of each are two orange-coloured dots, which are probably the nectaries; anthers roundiſh, yellow; ſtigma greeniſh; berries at firſt green, and, when ripe, changing to a fine red colour; ſeeds two, rarely three, faſtened at bottom to a minute tubercle, oblong, ſmooth, of a pale teſtaceous colour, and hard; the ſeed-lobes of an elliptic form. A native of the eaſtern countries, and now of moſt parts of Europe in woods, coppices, and hedges; in England, chiefly in a chalky ſoil, as particularly about Saffron-Walden in Eſſex. The flowers appear in May and June, and the fruit ripens in September. Miller mentions three varieties of this ſhrub, viz. B. ſine nucleo; Bauh. pin. 454 2, or without ſtone, occaſioned by the age of the plant; B. with white fruit, having leaves of a lighter green colour, and the bark whiter than the common ſort: and B. orientalis procerior fructu nigro ſuaviſſimo, Tournef. cor. differing only in the colour and flavour of the fruit. He makes the Canada barberry a diſtinct ſpecies, and ſays, that the leaves are much broader and ſhorter than thoſe of the common ſort, and that the fruit is black when ripe. It has been long ago obſerved by Linnæus, that when bees in ſearch of honey touch the filaments of this ſhrub, the anthers approximate to the ſtigma, and explode the pollen. This irritability is ſo remarkable, that if the filaments are touched near the baſe with the point of a pin, a ſudden contraction is produced, and this may be repeated ſeveral times. Dr. Smith, who has made this property the ſubject of particular examination, obſerves (ſee Phil. Tranſ. vol. lxxviii. p. 158.) that neither the outſide of the filament, nor the anther has any irritability; and that the ſpring of the ſtamens is owing to an high degree of irritability in the ſide of the filament next the germ, by which, when touched, it contracts, that ſide becoming ſhorter than the other, and conſequently the filament being bent towards the germ. After irritation, the ſtamens will return to their original place, and on being again touched, they will contract as eaſily as before. The purpoſe which this curious contrivance of nature is deſigned to anſwer is evident. When the ſtamina ſtand in their original poſition, their anthers are effectually ſheltered from rain by the concavity of the petals. Thus they probably remain till ſome inſect, in order to extract honey from the baſe of the flower, thruſts itſelf between their filaments, and almoſt unavoidably touches them in the moſt irritable part; in this way the impregnation of the germen is performed; and as it is chiefly in fine ſunny weather that inſects are on the wing, the pollen is alſo in ſuch weather moſt fit for the purpoſe of impregnation. Another peculiarity aſcribed to this ſhrub is, that ears of corn growing near it conſtantly prove abortive, and that it extends this ſterile influence over them to the diſtance of 3 or 400 yards acroſs a field. Duhamel long ſince looked upon the mildewing power of barberry as totally void of foundation, and M. Brouſſonet aſſured Dr. Smith, from his own obſervations, that the opinion, though very prevalent, was altogether groundleſs. Young's Annals, vol. vii. p. 188. Eng. Bot. p. 49. Withering's Bot. Arrang. vol. ii. p. 351.

The leaves of barberry are gratefully acid; the flowers are offenſive to the ſmell when near; but at a proper diſtance their odour is extremely agreeable. The berries are ſo acid that birds will not eat them. The barberry however is cultivated for the ſake of theſe, which are pickled and uſed for garniſhing diſhes; and being boiled with ſugar, they form an agreeable rob or jelly; they are uſed alſo as a dry ſweet-meat, and in ſugar-plumbs or comfits. They are moderately reſtringent, and are ſaid to be of great uſe in bilious fluxes, and in all caſes where heat, acrimony, and putridity of the humours prevail. On the authority of Proſper Alpinus (Med. Egypt. l. iv. c. 1.) we are informed, that the Egyptians employ them in peſtilential fevers and fluxes with great ſucceſs; and Simon Paulli relates, that he was cured of a malignant fever, accompanied with a bilious diarrhœa, by uſing theſe berries according to the Egyptian practice; that is, macerating the fruit for a day and a night in twelve times its quantity of water, with the addition of a little fennel ſeed; and then ſtraining and ſweetening the liquor, and uſing it as a common drink. Dr. Woodville obſerves, (Med. Bot. vol. iv. p. 62.) that theſe berries are well calculated to allay heat and thirſt, and to correct a putrid tendency in the fluids; but that in this [illegible] of the other acid fruits; hence the colleges of London and Edinburgh have expunged this fruit from the Materia Medica, and retained only that of the currant. The bark is ſaid to be purgative, and Ray experienced its good effects taken

taken as a decoction in the jaundice. The roots boiled in lye dye wood yellow. In Poland they dye leather of a moſt beautiful yellow with the bark of the root: and the inner bark of the ſtem dyes linen of a fine yellow, with the aſſiſtance of alum. Withering, *ubi ſupra*. Kine, ſheep, and goats, are ſaid to eat this ſhrub, and horſes and ſwine to refuſe it.

2. B. *cretica*, Cretan, or box-leaved barberry; Lycium Creticum, Alp. Exot. 21. t. 20. Pon. Ital. 137. "Peduncles ſub-umbelled, ſpines triple." A ſhrub that never riſes more than 3 or 4 feet high in England, where the flowers are not ſucceeded by fruit. A native of the iſland of Candia, or Crete, and alſo of Japan. Cultivated in 1759, by Mr. Miller; flowering in April and May. 3. B. *ilicifolia*, holm-leaved barberry. Lin. Syſt. 343. Suppl. 210. "Leaves obovate, ſerrate-ſpinous, pedicels elongated cymoſe, ſpines digitate." Found in the Terra del Fuego by Sparman, where the inhabitants uſed the wood for bows, on account of its great elaſticity. 4. B. *ſibirica*, Siberian barberry. Linn. Syſt. 343. Murr. in com. got. 1784. 37. t. 6. Pall. It. 2. 737. t. P. f. 2. "Peduncles one-flowered, ſolitary, nodding; ſpines palmate." A ſmall ſhrub, ſcarcely a ſpan in height. A native of Siberia, where it was obſerved by Pallas.

Propagation and Culture. The common ſort is generally propagated by ſuckers; but as the plants thus propagated ſend out ſuckers in greater abundance than thoſe which are propagated by layers, the latter method ſhould be preferred. The beſt time for laying down the branches is autumn, and the young ſhoots of the ſame year are the beſt; which will be well rooted by the next autumn, when they may be taken off and planted where they are to remain. When this plant is cultivated for its fruit, it ſhould be planted ſingle, and not in hedges; and the ſuckers taken away every autumn, and all the groſs ſhoots pruned out; by this method the fruit will be fairer and more abundant. A few of theſe ſhrubs will make an agreeable variety in wilderneſſes or plantations of ſhrubs; and the fruit will be food for birds; but they ſhould not be planted in too great quantities, or near walks that are much frequented, becauſe their flowers emit a very ſtrong diſagreeable odour. The Canada ſort may be propagated in the ſame way as the common ſort, and is equally hardy. The box-leaved ſort, which is now very rare in England, may be propagated by laying down the branches in the ſame manner as the firſt; but the young plants ſhould be ſet in pots, or ſheltered under a frame in the winter; and when they have acquired ſtrength, they may be turned out of the pots, and planted in a warm ſituation. Martyn's Millar's Bot.

BERBI, in *Geography*, a town of Africa, on the Ivory coaſt, N. E. of cape Palmas. N. lat. 4° 30′. W. long. 5° 34′.

BERBICE, the ſeat of a colony of Guiana in South America, formerly belonging to the Dutch, on a river of the ſame name, about 25 leagues N. W. by W. ½ N. diſtant from Surinam, which runs from N. to S. and diſcharges itſelf into the Atlantic ocean. The coaſt on each ſide of the river forms a bay at its entrance, nearly a mile broad, in the middle of which is a ſmall iſland, called "Crab iſland." Oppoſite to this iſland, on the eaſtern ſhore, is a fort, with ſeveral pieces of artillery, and ſome ſoldiers; but the channel on the other ſide, which is navigable for ſhips of any burden, is undefended, and covered by the iſland from the guns on the oppoſite ſhore. Without the entrance of the river is a bar, which, at high tide, has ſeldom more than 16 feet of water; but within the water is of ſufficient depth, and the river is navigable for ſhips of burden 200 miles from its mouth. The plantations are ſituated on each ſide of the river, and extend nearly 300 miles from its entrance at fort Naſſau, which was formerly the ſeat of government, and contiguous to which were the public offices and houſes of the civil and military officers, about 100 miles from the mouth of the river. But the ſeat of government is now fixed at a point of land on the eaſtern ſhore of Berbice, about a mile from its entrance, which is formed between Berbice and the river Conya, which there diſcharges itſelf into the former. This is a narrow, but deep river, running from ſouth to north, but diverging ſomewhat eaſterly from Berbice. On the ſides of this river are ſeveral plantations, which form a part of the colony of Berbice. The produce of theſe plantations conſiſts chiefly of ſugar, coffee, cotton, and cocoa, and other articles, ſuch as are furniſhed by Surinam. Bancroft's Nat. Hiſt. of Guiana, p. 350, &c. The colony of Berbice ſurrendered to the Britiſh arms in September 1803. The river Berbice diſcharges itſelf into the Atlantic in N. lat. 6° 30′, and W. long. 57° 20′.

BERBUDA. See BARBUDA.

BERBURG, a town of the Netherlands, in the duchy of Luxemburg; 12 miles N.E. of Luxemburg.

BERCAD, a town of Poland, in the palatinate of Braclaw, near the Bog; 52 miles S.S.E. of Braclaw.

BERCARIA, BERQUERIA, or BERKERIA, in *Middle Age Writers*, denotes a ſheep-fold, ſheep-cote, ſheep-pen, or other incloſure, for the ſafe keeping of a flock of ſheep.

The word is abbreviated from *berbicaria*; of *berbex*, detorted from *vervex*. Hence alſo a ſhepherd was denominated *berbicarius*, and *berquarius*.

BERCHEM, or BERGHEM, NICHOLAS, in *Biography*, an eminent painter of landſcapes and cattle, was born at Haerlem in 1624, and formed for the practice of his art under ſome of the beſt maſters of his time. In his manner of painting he was eaſy and expeditious, and though he ſelected a very great variety and beauty of ſites for his landſcapes, he executed them with a ſurpriſing degree of neatneſs and truth. He poſſeſſed a clear and ſtrong judgment, and a facility in expreſſing his ideas; and, therefore, in the lower kind of ſubjects to which he directed his attention, his choice of nature was judicious, and he gave to every ſubject as much beauty and elegance as it would admit. The leafing of his tree is exquiſitely and freely touched; his ſkies are clear; and his clouds float lightly, as if ſupported by air. The diſtinguiſhing characters of the pictures of Berchem are the breadth and juſt diſtribution of the lights; the grandeur of his maſſes of light and ſhadow; the natural eaſe and ſimplicity in the attitudes of his figures; the juſt degradation of his diſtances; the brilliancy and harmony, as well as tranſparency, of his colouring; the correctneſs and true perſpective of his deſign; and the elegance of his compoſition. He painted every part of his ſubject ſo well, as to render it difficult to determine in which he excelled moſt; his trees, buildings, water, rocks, hills, cattle, and figures, being all equally admirable. One of the moſt capital pictures of this maſter was painted for the principal magiſtrate of Dort, in whoſe family it is preſerved; it exhibits the proſpect of a mountainous country, enriched with a great variety of ſheep, oxen, goats, and figures, excellently pencilled, and moſt beautifully coloured. Berchem was indefatigable, partly from his love of labour, and partly to gratify the avaricious diſpoſition of his wife, who never allowed him to relax; and he painted, in the ſummer months, from four in the morning till day light failed: in conſequence of this cloſe application, his pictures are very numerous; and yet at this day they are rarely to be purchaſed, and always afford a

very

very high price. Berchem died in 1683. We have several etchings by this master, that are executed in a fine, bold, masterly style; and and from these John Visscher seems to have formed that admirable style in which he engraved the copies from Berchem's pictures. Pilkington and Strutt.

Berchem, in *Geography*, a town of Brabant: 4 miles S. W. of Ravestein.

Berchem, or *Bergen*, a town of Germany, in the circle of Westphalia, and duchy of Juliers; 9 miles east of Juliers.

BERCHEROIT, or Berkcoits, in *Commerce*, a weight used at Archangel, and in all the Russian dominions. It is equal to about 364 pounds English avoirdupois.

BERCHET, Peter, in *Biography*, an historical painter, was born in France, in 1659, and placed, at the age of 15, under the care of La Fosse, so that in 3 years he was qualified to be employed in the royal palaces. In 1681, he came over to England, and worked under Rambour, a French painter of architecture. Berchet painted the ceiling in the chapel of Trinity college, Oxford, the staircase at the duke of Schomberg's house in London, and the summer-house at Ranelagh. His drawings in the Academy were much approved. Towards the close of life he only painted small historical pieces, the subjects of which were taken from fabulous history; and his last performance was a Bacchanalian picture, to which he affixed his name the day before he died, in the year 1721. He occasionally amused himself with the point. Pilkington and Strutt.

BERCHING, in *Geography*, a small town of Germany, in the bishopric of Eichstett, or Aichstadt, seated on the river Sulz.

BERCHORIUS, Bercheur, Peter, in *Biography*, a learned divine and voluminous writer of the 14th century, was born at the village of St. Pierre du Chemin, 3 leagues from Poictiers in France, and was constituted grammatical preceptor to the novices of the Benedictine monastery at Clugni, in the year 1340. He died prior of the Benedict convent of St. Eloi at Paris, probably at an advanced age, in the year 1362, as we learn from his epitaph in that monastery. Berchorius was one of those writers who affected to interpret allegorically, not only texts of Scripture, but also poetical fables and profane histories, which they arbitrarily applied to the explication or confirmation of the mysteries of Christianity. His three grand printed works are, "Reductorium Morale super totam Bibliam," in 26 books, first printed Argentorat. 1473, fol. and containing all the incidents and stories in the Bible, reduced into allegories, "Repertorium, or Reductorium, Morale," in 14 books, which is a dictionary of things, persons, and places, all which are supposed to be mystical, and are therefore explained in their moral and practical sense; and "Dictionarium Morale," in two parts, and seeming to be principally designed as a moral repertory for students in theology. These pieces were all printed at a very early period; and a folio edition of them was printed, in 3 volumes, at Venice, in 1583. Berchorius was also the author of a comment on a prosody, called "Doctrinale Metricum," which was used as a school-book in France. Glassius, in his "Philologia Sacra," written about the year 1623, and of which a third edition was printed at Francof. and Hamb. in 1653, ascribes to this author the famous work entitled "Gesta Romanorum;" the writer of which has for a long time remained unknown to the most diligent inquiries into Gothic literature. The learned Mr. Thomas Warton concurs in this opinion, and thinks it amply confirmed by the general coincidence of the plan, manner, method, and execution between the "Gesta Romanorum," and the three works of Berchorius abovementioned. He supposes it was written about the year 1340, with a view of rendering the exercises of his scholars, in the monastery at Clugni, in Latinity, more agreeable and easy, by means of an entertaining Latin story-book, capable of being readily applied to lessons of religion. This piece operated powerfully on the general body of our old poetry, and afforded a variety of inventions, not only to Chaucer, Gower, and Lydgate, but to their distant successors. It was first printed in the Gothic letter without date, and as it is supposed, before or about the year 1473, in folio; and contains 152 chapters. The second edition was printed in the same or following year at Louvain, in 4to, and contains 181 chapters. Another edition was printed in folio, in 1488. At the commencement of typography in England, a translation of it in English was printed by Wynkin de Worde, and it was afterwards frequently reprinted. This work is compiled from the obsolete Latin chronicles of the later Roman, or rather German story, heightened by romantic inventions, from legends of the saints, oriental apologues, and many of the shorter fictitious narratives, which came into Europe with the Arabian literature, and were familar in the ages of ignorance and imagination. The classics are sometimes cited for authorities; but these are of the lower order, such as Valerius Maximus, Macrobius, Aulus Gellius, Seneca, Pliny, and Boethius. To every tale is subjoined a moralisation, reducing it into a Christian or moral lesson. Warton's Hist. Eng. Poetry. vol. iii.

BERCHTOLDSDORF, or Petersdorf, in *Geography*, a town of Germany, in the archduchy of Austria, 6 miles south-west of Vienna.

BERCHTOLSGADEN, or Bergtolsgaden, a provostship and principality of Germany, in the circle of Bavaria, environed by the archbishopric of Saltzburg, but exempt from the jurisdiction of that see. It is wholly mountainous, and contains two towns and a few villages, and also several lakes. At Bergtolsgaden, as well as at Hallein, in the principality of Saltzburg, salt is found in its fossile state. In order to obtain it, large cavities, or chambers, are dug in the mines, and filled with fresh water. Some of these are so large that the water must stand in them during two years before it is sufficiently impregnated with salt; in others, this process does not require more than a few weeks. When the water is saturated, it is carried through the mountain by pipes into a reservoir, whence it is conveyed to the cauldrons. Of these there are four at Hallein, and two at Bergtolsgaden, which are not above four leagues distant from each other. The salt annually made at the former of these places, amounts to 400 000 quintals, and at the latter to 160,000. Count Razoumowski supposes (Hist. et Mem. de la Societé des Sciences Physiques de Lausanne, vol. iii. for 1787 and 1788), that the mines at Hallein, and those at Bergtolsgaden, are parts of the same bank of salt, which, in his opinion, is a continuation of that of Gmund in Austria, about 8 leagues from Hallein; and the irregularity of the strata seems to indicate that the connexion between the two mines must have been broken by some violent convulsion.

BERCKEL, a town of Holland, 5 miles east of Delft. —Also, a river of Germany, which rises in the bishopric of Munster, and runs into the Issel at Zutphen.

BERCKSENBROECK, a town of Holland, 6 miles north of Rotterdam.

BERD, a river of Siberia, which runs into the Oby, near Berstkoi.

BERDA, in *Ichthyology*, a species of Sparus, that inhabits the Red sea. It is of a whitish grey; lateral scales marked in the middle with a single transverse brown band; dorsal spines recumbent. Forsk. F. n. Arab. The body of this fish is oval; back gibbous, with pale bands; beneath white; scales

ſcales broad, rounded, entire. The crown is naked, convex, ſloping; iris white; noſtrils large, linear, with a conic cirrus; four long, conic, ſubulate, inciſive teeth; grinders numerous, hemiſpherical, thoſe behind largeſt; upper lip long, protractile; gill-covers entire; lateral line neareſt the back; fins brown, pectoral ones tranſparent and lanceolate; tail two-lobed. Gmelin.

BERDA, *Cape*, or BERDINSKAYA, in *Geography*, the eaſt point of a large bay of the ſea of Azoph; cape Wiſarionova, or Besſarionova, being the weſt point. Several rivers empty themſelves into this bay. N. lat. 46° 42′. E. long. 56° 24′.

BERDAA, a town of Aſia, in Armenia, 160 miles eaſt of Erivan.

BERDANIEH, a town of Aſiatic Turkey, in the province of Caramania; 32 miles north of Alameh.

BERDASCHIR. See BARSIR.

BERDASH, in *Antiquity*, was a name formerly uſed in England for a certain kind of neck-dreſs; and hence a perſon who made or ſold ſuch neckcloths was called a *berdaſher*, from which is derived our word *haberdaſher*.

BERDICZOW, in *Geography*, a decayed town of Poland, in the palatinate of Volhynia, 148 miles E.S.E. of Lucko, and 324 S.W. of Warſaw.

BERDIN, or BERLIN, in *Conchology*, the name by which the *limpet*, or pap-ſhells, *patella* of Linn., is known on the coaſt of Normandy. It is alſo called in ſome places *bernacle*, or *bernicle*.

BERDOA, in *Geography*, a province of Africa, in the eaſtern diviſion of the great deſert or Sahara, conſtituting one of the Oaſes or fertile iſlands, which forms a part of that extenſive deſert that ſeparates Egypt from Fezzan, and contains the wandering tribe of Lebeta or Levata. It is ſituated to the north-eaſt of Agadez, and has Kuar or Kawar to the ſouth and eaſt, to the north Augela, and the deſert of Barca, and to the weſt Fezzan. It extends northward from N. lat. 25°, and lies between 20° and 25° E. long.; but its exact boundaries are not aſcertained. Berdoa, its capital, lies north of the mountains of Tibeſti; and, according to Rennell's map, is placed in N. lat. 26° 32′. E. long. 21° 35′.

BERE-ALSTON, though only a ſmall inconſiderable hamlet, in the pariſh of Bere-Ferris, Devonſhire, has the privilege of returning two members to the Engliſh parliament. The right of election is veſted in thoſe perſons who poſſeſs land in the borough, and pay three-pence acknowledgment to the lord of the manor, who varies the number of electors at pleaſure, by granting burgage tenures to his own partizans only. The firſt return of members for this borough was in the 27th of Elizabeth. In the vicinity of this place are ſeveral lead mines; but none of them produce much ore, though in the time of Edward I. they were not only very rich in this metal, but yielded a great quantity of ſilver. It is ſaid that 1600 weight of the latter was obtained in the courſe of three years.

BERECYNTHUS, in *Entomology*, a ſpecies of PAPILIO, with entire wings, black above, with a yellow marginal band; ſix ocellar ſpots on the underſide of the poſterior pair. Fabricius. This is *papilio berecynthia* of Cramer, is of a large ſize, and inhabits Surinam.

BERECYNTIA, in *Ancient Geography*, a town of Aſia Minor, in Phrygia. Steph. Byz.

BERECYNTIA *Regio*, a country of Aſia, towards the river Sangar. Steph. Byz.

BERECYNTIUS TRACTUS, a canton of Aſia Minor, in Caria. Pliny.

BERECYNTUS, a mountain of Aſia Minor, in Phrygia, conſecrated to the mother of the gods.

BERECZINA, in *Geography*, a river of Lithuania, which riſes in the palatinate of Vilna, and runs into the Niemen, 16 miles north-eaſt of Novogrodek.

BEREFIORD, a trading place and port of the iſland of Iceland.

BEREGRA, or BERETRA, in *Ancient Geography*, a town of Italy, in Picenum, at a ſmall diſtance north from Interamna.

BEREGSZAZ, in *Geography*, a town of Hungary, 24 miles north of Zatmar. It gives name to a county, and derives its appellation from a Saxon colony eſtabliſhed there; but its preſent inhabitants are Hungarians.

BEREIA, a town of Africa, north of Sierra Leone, at a ſmall diſtance from the coaſt. N. lat 8° 58′. W. long. 12° 28′.

BEREILLY, or BARELLY, a city of Hindooſtan; is the capital of Rohilcund, which was added to the dominions of Oude in 1774. It lies about half way between Lucknow and Delhi. N. lat. 28° 27′. E. long. 79° 45′. See BARELLY.

BERELOS, a lake of Egypt, between Damietta and Roſetta; about 32 miles long and ten broad in the middle, but gradually contracting towards each end. It has within it ſeveral iſlands.—Alſo, a town of Egypt, 30 miles weſt of Damietta.

BEREN, an iſland of Aſia, 40 leagues weſt from Congo iſland in the gulf of Baſſora.

BEREN, or BIERON, a town of Sileſia, in the province of Ratibor; 34 miles eaſt of Ratibor.

BERENBORG, called alſo Joan Main iſland, an iſland in the north ſeas, near the coaſt of Eaſt or Old Greenland. N. lat. 71° 10′. W. long. 9° 19′.

BERENGARIANS, in *Eccleſiaſtical Hiſtory*, a religious ſect, adhering to the opinions of Berengarius, who, in the latter part of the eleventh century, a conſiderable time before Luther, oppoſed the doctrine of tranſubſtantiation, and the real preſence, ſtrenuouſly maintained by Lanfranc and Anſelm. See BERENGER.

He is farther charged by the Romaniſts with decrying marriage, and maintaining the common uſe of all ſorts of women, and aſſerting baptiſm of no effect.

His followers were divided on the head of the euchariſt: though they all agreed, that the bread and wine were not eſſentially changed, yet ſome allowed, that the body and blood of Chriſt were contained in them, though concealed under an impanation: others denied any change at all, and reſolved the whole into figure; others again allowed a change in part; and others an entire change, with this reſtriction, that to thoſe who preſented themſelves unworthily it was changed back again.

Mabillon has an expreſs diſſertation on the manifold condemnations of Berengarius, his retractations, relapſes, and repentance.

BERENGER, JAMES, in *Biography*, a native of Carpi, in Modena, from whence he took his name, being much more known by the name of Carpus, than by that of his family, Berengarius; one of the reſtorers and improvers of anatomy, was born about the end of the fifteenth century. He was initiated into the knowledge of ſurgery by his father, who practiſed that art, and had for his inſtructor in languages and philoſophy, the celebrated Albertus Minutius. At a proper age he went to Bologna, and afterwards to Padua, where he filled for ſome time the office of profeſſor of anatomy. Returning in 1518 to Bologna, he was there raiſed to the ſame office, which he continued to fill until about the year 1525. While teaching here, he is ſaid to have diſſected upwards of an hundred human bodies: a prodigious

prodigious number for the time, when the prejudice against handling or disturbing the dead was so strong. To that circumstance, aided by his known antipathy to the Spaniards, perhaps may be attributed the story of his having dissected two of the natives of that country alive, with the view of seeing the motion of the bowels, and of his being on that account obliged to fly his country. A similar story had been told of Herophilus, and was afterwards told of Vesalius. That this, however, had been done by some anatomists, or that he was accused of it, seems probable by his speaking of such a practice in his commentary on the works of Mundinus, with disgust and horror. He is with more reason said to have offended the ministers of religion by the levity and indecency of his conversation on the subject of his dissections, and by the profligacy of his life; and on that account to have been obliged to quit Bononia.

By his numerous dissections, he was enabled to correct many erroneous opinions as to the structure of the interior parts of the body, which prevailed to his time, and thence to pave the way for the further improvements made by Vesalius, his immediate successor. If he was not the inventor, as Douglas calls him, he was one of the first who used mercurial frictions in curing the venereal disease, by which he is said to have acquired a large fortune, which he left, at his death, to the duke of Ferrara, to whose territory he retired, and where he died, about the year 1527. His works are, "Commentaria, cum amplissimis additionibus, supra anatomiam Mundini, cum textu ejus in pristinum nitorem redacto," Bononia, 1521, 4to., containing, besides numerous corrections of Mundinus, a prodigious number of anatomical facts, which bear abundant testimony to his diligence and ingenuity. "Ea omnia enarrare, quæ recte videt (Haller says), infinitum foret;" and further on, "Invenio apud hunc virum, testimonium irrefragabile pro antiquo more, quo cardinales testes pontificis, nuper electi, contrectarunt." There are several rude engravings of the muscles of the abdomen, and of other parts, in this volume. "Isagogæ breves, perlucidæ et uberrimæ in anatomiam humani corporis ad suorum scholasticorum preces in lucem editæ," Bonon. 1522, 4to. also with plates. Both these works have passed though numerous editions. In 1664, it was published in London, with the title, "A Description of the Body of Man, being a practical Anatomy." He also published, in 1518, 4to. Venet. "De Cranii Fractura." Douglas. Bib. Anat. Haller. Biblioth. Chirurg.

Berenger, Berengarius, an eminent logician and controversialist, was a native of Tours in the eleventh century, and having studied under Fulbert at Chartres, he returned to Tours, where he was made principal of the school of St. Martin, and treasurer of the church. From Tours he removed to Angers, and became archdeacon of that city. Distinguished by his acute and subtil genius, by his extensive learning, and by his peculiar talents for controversy, as well as by the exemplary sanctity of his life and manners, he was held in very high estimation. At length, however, he found reason to deviate from the doctrines of the church concerning the eucharist; and in 1045, he began to maintain publicly the doctrine of Scotus, in opposition to the opinions of Radbert; and he persisted in teaching that the bread and wine were not changed into the body and blood of Christ in the eucharist, but preserved their natural and essential qualities, and were merely figures and external symbols of the body and blood of our Saviour. Although the church of Rome had not, in this century, adopted any settled and decided opinion concerning the nature and manner of Christ's presence in the eucharist, the doctrine of Berenger was not only opposed by several doctors in France and Germany, but attacked with peculiar vehemence and fury by the Roman pontiff Leo IX. who, in 1050, convened two councils, one at Rome, and the other at Vercelli, in which it was solemnly condemned; and the book of Scotus, from which it was deduced, was committed to the flames. The council of Paris, summoned in the same year by Henry I., concurred in its condemnation, and menaced Berenger, and his numerous adherents, with all sorts of evils, both spiritual and temporal. The heresiarch was deprived by Henry of all his revenues; but he continued for some time afterwards firm and resolute in his adherence to the doctrine he had embraced, and enjoyed unmolested tranquillity. The prevalence of his doctrine, notwithstanding the opposition with which it encountered from the writings of its antagonists, and particularly from those of Anselm and Lanfranc, archbishops of Canterbury, alarmed the church; and two councils were summoned by Victor II. at Tours, in 1054, to examine anew this dangerous doctrine. In one of these councils, Hildebrand, afterwards pope Gregory VII. appeared as the pope's legate, and took the lead in opposing this new heresy. Berenger, who was present, was at length overpowered by threats, and not only abandoned his opinions, but solemnly abjured them, and made his peace with the church. This abjuration, however, was only an act of timidity and dissimulation; for he soon after taught the opinions he had formerly professed, though the dread of danger rendered him more circumspect and cautious. As soon as Berenger's perfidy was announced to Nicholas II., the exasperated pontiff summoned him to Rome in 1058, and in a council held there the following year, he was so terrified, that he declared his readiness to embrace and adhere to the doctrines which that venerable assembly should think proper to enjoin. Accordingly, Humbert was employed by the pope and council to draw up a confession of faith, which Berenger publicly signed, and to which, by a solemn oath, he avowed his adherence. As soon as Berenger returned to France, and found himself countenanced and protected by his ancient patrons, he expressed his detestation of the doctrines which he had been obliged to profess at Rome, abjured them solemnly both in his discourses and writings, and zealously inculcated his former opinion. Pope Alexander II. attempted by soothing and friendly expostulations to regain the apostate; but his remonstrances were ineffectual; the controversy was prolonged for many years, and the followers of Berenger continually increased. As soon as Hildebrand was advanced to the papal chair, he undertook to terminate the controversy; and with this view required Berenger, in 1078, to repair to Rome. Towards the conclusion of this year, a council was held in this city, and Berenger was permitted to draw up a new confession of his faith, and to renounce that which had been composed by Humbert, and approved by Nicholas II. and a Roman council. On this occasion the persecuted prelate made a declaration, confirmed by an oath, that he would for the future adhere to the following proposition: viz. "that the bread laid on the altar became, after consecration, the true body of Christ, which was born of the Virgin, suffered on the cross, and now sits at the right hand of the father; and that the wine placed upon the altar became, after consecration, the true blood which flowed from the side of Christ." This declaration satisfied the pontiff, but was thought by the enemies of Berenger to be too vague and equivocal. Gregory yielded to their clamours; and at a council held at Rome, in 1079, a new confession of faith was drawn up, to which Berenger, after reading and subscribing it, declared his assent by a solemn oath. This confession expressed his belief, "that the bread and wine were, by the mysterious influence of the holy prayer,

prayer, and the words of our redeemer, ſubſtantially changed into the true, proper, and vivifying body and blood of Jeſus Chriſt;" and this was followed by a ſolemn declaration, "that the bread and wine, after conſecration, were converted into the real body and blood of Chriſt, not only in quality of external ſigns and ſacramental repreſentations, but in their eſſential properties, and in ſubſtantial reality." Gregory diſmiſſed him with the moſt honourable teſtimonies of his friendſhip and liberality, and he returned to his own country. But Berenger, not conceiving himſelf bound by this declaration, publicly retracted the ſentiments which he had ſolemnly avowed at Rome, and even compoſed an elaborate refutation of the doctrine to which he had been compelled to profeſs his aſſent. Gregory, who ſeems not to have approved the laſt confeſſion impoſed upon Berenger, when appealed to, declined interfering, and took no meaſures for moleſting him. From this time, Berenger obſerved a profound ſilence amidſt the clamours of his incenſed adverſaries, and made no reply to their bitter and repeated invectives. At length, decaying with age, overpowered by the oppoſition with which he had inceſſantly ſtruggled, and probably depreſſed with the reproaches of his own mind for the puſillanimous and diſhoneſt part he had acted, he abandoned all his worldly concerns, and retired to the iſle of St. Coſme, in the neighbourhood of Tours, where, in a courſe of penitential and pious exerciſes, he paſſed the ſhort remainder of his life; and in 1088, he was releaſed by death. On the minds of the people, he left behind him a deep impreſſion of his extraordinary ſanctity; and an annual ſervice is ſtill performed for him in the church of St. Martin at Tours. His unſteady conduct was unqueſtionably very diſgraceful to him; and there is reaſon to believe that it embittered the reflections of his retirement and cloſing ſcene. It is therefore a queſtion of little importance, whether he abandoned his original opinion before his death, as the Roman catholic writers maintain, or whether he adhered to it in the laſt period of his life, as the proteſtants, with greater probability, have aſſerted. All his works, which were numerous, have been loſt; except two letters, his three profeſſions of faith, and part of his treatiſe againſt one of them. Cave's Hiſt. Lit. tom. ii. p. 130. Moſheim's Eccl. Hiſt. vol. ii. p. 559, &c.

BERENICE, or BERNICE, a Jewiſh queen, the daughter of Agrippa the elder, and ſiſter of Agrippa the younger, kings of Judæa. She was born about the year of Chriſt 28, and at the age of 16 married her uncle Herod, king of Chalcis. After her huſband's death, A. D. 48, ſhe was ſuſpected of having criminal intercourſe with her brother Agrippa; and in order to remove ſuſpicions, and to ſilence rumours of this kind, ſhe conſented to marry Polemon, king of Pontus and part of Cilicia, on condition of his embracing Judaiſm. She lived with him, however, but a little while, and returned to her brother, with whom ſhe lived on terms of intimacy, which ſubjected her to reproach. Juvenal refers to this inceſtuous connection (ſat. vi. v. 155):

—— "Deinde Adamas notiſſimus, et Berenices
In digito factus pretioſior; hunc dedit olim
Barbarus: inceſtæ dedit hunc Agrippa ſorori."

When Agrippa heard the diſcourſe of St. Paul before Feſtus at Cæſarea of Paleſtine, Berenice was preſent with him. After the commencement of the Jewiſh war in 67, when Agrippa was driven from Jeruſalem by the ſeditious people, ſhe remained for ſome time after him, and interceded for the Jews with the Roman governor Florus, by whom ſhe was treated with great diſreſpect. She afterwards accompanied Agrippa to the army of Veſpaſian in Syria; and contrived, by coſtly preſents, to engage the good will of that avaricious emperor as long as he lived. Her beauty and addreſs had alſo captivated Titus; and on the death of Veſpaſian ſhe followed him to Rome. The emperor was much attached to her, and diſpoſed to make her his queen; but in deference to the ſentiments of the Roman people, who diſliked the idea of a foreign queen, and who well knew that her character was not irreproachable, he diſmiſſed her, and ſent her away to her own country. What became of her afterwards hiſtory does not inform us. Joſ. Antiq. l. xix. xx. De Bell. Jud. l. ii. Tacit. Hiſt. l. ii. Crevier. Gen. Dict.

BERENICE was likewiſe the name of ſeveral Egyptian and eaſtern queens. One of them, the wife of Ptolemy Euergetes, king of Egypt, under an apprehenſion of the danger to which he would be expoſed in his expedition to Syria, made a vow to conſecrate her hair, which was her chief ornament, in caſe of his ſafe return. When the prince returned, not only in ſafety, but crowned with glory and ſucceſs, ſhe immediately cut off her hair, and dedicated it to the gods in the temple which Ptolemy Philadelphus had built in honour of his beloved Arſinoë, under the name of the Zephyrian Venus, on the promontory of Zephyrium in Cyprus; but this hair being loſt by the negligence of the prieſts, Ptolemy was enraged, and threatened to puniſh them. Upon which Conon of Samos, a flattering courtier, as well as ſkilful mathematician, with a view to appeaſe the king's anger, and to conciliate his favour, affirmed, that the queen's locks had been conveyed to heaven, and pointed out ſeven ſtars near the tail of the lion, which till that time had not belonged to any conſtellation, declaring that they were the queen's hair. Several other aſtronomers confirmed the aſſeveration of Conon; and hence "Coma Berenices," or Berenice's hair, became one of the conſtellations.

Callimachus, who lived at that time, and had been a great favourite of Philadelphus, wrote a hymn on the hair of Berenice, which was afterwards tranſlated by Catullus, whoſe verſion is extant among his other performances. Berenice, according to Plutarch (In Quæſt. Græc.) and Stephanus Byzantinus (verb. Βερενίκη), was formed from Φερενίκη, a bearer of victory, by the Macedonians, who exchanged Ph into B.

BERENICE, in *Entomology*, the name under which Cramer figures *papilio erippus* of Fabricius and Gmelin.

BERENICE, in *Ancient Geography*, the name of ſeveral cities, of which Ortelius reckons nine. The principal are as follow: viz. a town of Thrace:—another of Aſia Minor in Cilicia:—another of Aſia, called Pella in Cœlo-Syria; all three mentioned by Stephanus Byzantinus:—another of Africa in Cyrenaica, near the mouth of the river Lathon, or Lethon, where it diſcharges itſelf into the bay of Syrtis, anciently called Heſperis, and Heſperides, now Berenice: near this town was ſituated the garden of Heſperides, and a wood ſtill marks its poſition, in a country deſtitute of trees:—another, a maritime town of Arabia Petræa, ſituated at the extremity of the Arabian gulf, or Red ſea, the promontory of Heroopolis, and that of Strobilus, according to Pomponius Mela; it is mentioned by Joſephus, in his account of Solomon's fleet, who ſays, it was not far from the city of Ælana, and that it was formerly called Aſſingaber, or Eziongaber, in which poſition of it M. d'Anville acquieſces:—another, a famous town of Egypt, ſo named from the mother of Ptolemy Philadelphus, who founded it on the weſtern ſide of the Red ſea, and nearly under the tropic, about 450 miles below Suez, in order to avoid the ſlow and dangerous navigation of the upper part of the Red ſea; this city ſoon became the ſtaple of the trade with India. From Berenice the goods were tranſported by land to Coptos, a city three miles diſtant from the Nile, but which had a communication with that river by a navigable canal, of which there are ſtill ſome remains, and thence carried down the ſtream of the Nile, and

and its canals, to Alexandria. The diſtance between Berenice and Coptos, according to Pliny (Nat. Hiſt. l. vi. c. 29.) confirmed by the Itinerary of Antonine, and approved by M. d'Anville, was 258 Roman miles; and the road lay through the deſert of Thebais, almoſt entirely deſtitute of water. But the attention of a powerful monarch made proviſion for ſupplying this want, by ſearching for ſprings, and wherever theſe were found he built inns, or more probably, in the eaſtern ſtyle, caravanſeras, for the accommodation of merchants. See Strabo. Geog. l. xvii. p. 1157. D. 1169. In this channel the intercourſe between the eaſt and weſt continued to be carried on during 250 years, as long as Egypt remained an independent kingdom. Berenice continued to be the port of out-ſit for the Roman Eaſt India trade in the time of Pliny (A. D. 79.) who details, in his 6th book, the account of the navigation to India, and who informs us, that it coſt 50 millions of ſeſterces, or about 440,000l. every year. From Berenice it was reckoned 30 days' navigation down the Red ſea to Ocelis (Gella) juſt within the ſtreit of Babelmandel. From Ocelis to Muziris, the firſt port of merchandize in India, was 40 days' ſail: ſo that as they left Berenice about Midſummer, they might arrive in India in the latter end of Auguſt, when the violence of the S. W. monſoon was abated, and the coaſting navigation ſafe and eaſy. Theſe voyages were firſt made by coaſting along the Arabian ſhore, to the promontory Syagrus (now cape Raſalgate,) and thence along the coaſt of Perſia, either directly to Pattala (now Tatta,) at the head of the lower Delta of the Indus, or to ſome other emporium on the weſt coaſt of India. Afterwards, a ſhorter and ſafer courſe was diſcovered; and from cape Raſalgate veſſels ſailed in a direct courſe to Zizerus, which, according to major Rennell, was a port on the northern part of the Malabar coaſt. In a ſubſequent period, a direct courſe was purſued from the outlet of the Red ſea to Muziris. It has not been accurately aſcertained what were the other ports in India which the merchants from Berenice frequented, when that trade was firſt opened; but it is probable, that as their veſſels were of ſmall burden, and kept near the coaſt, their voyages were circumſcribed within very narrow limits, and that under the Ptolemies, no conſiderable progreſs was made in the diſcovery of India. Rennell's Mem. Introd. p. 35—37. Robertſon's Hiſt. Diſq. concerning India, p. 46, &c.—Another Berenice was a town of Africa, on the Red ſea, ſituate more to the ſouth than the preceding, in the country of the Troglodytes, at the entrance of the Red ſea, near the ſtrait of Babel-Mandel, known by the epithet of "Epidiris:"—another, denominated by Pliny (l. vi. c. 29.) "Panchryſos," from the gold duſt in its vicinity; and by Strabo, *ad Dadas, juxta Sabas*, on the ſame coaſt; tranſferred by Hardouin to Arabia Felix, but mentioned by Strabo and Pliny in connection with the country of the Troglodytes.

BERENICE's Hair, in *Aſtronomy*. See Berenice *above*, and Coma *Berenices*.

BERENTHA, in *Ancient Geography*, a ſmall town of Peloponneſus in Arcadia, mentioned by Steph. Byz. and Pauſanias.

BERENTHEATE, a ſmall river of Peloponneſus in Arcadia, that diſcharged itſelf into the Alpheus. Pauſanias.

BERENTZ, in *Geography*, a town and caſtle of Hungary; 20 miles N. N. E. of Preſburg.

BERES, in *Ancient Geography*, a town of Thrace. Steph. Byz.

BERESKY, in *Geography*, a town of Poland, in the palatinate of Braclaw; 40 miles S. E. of Braclaw.

BERESNA, or Beresin, a diſtrict and town of Tchernigof in Ruſſia, ſituated on the Deſna, 24 miles E. N. E. of Tchernigof.

BERESOF, or Beresow, a diſtrict of the province of Tobolſk in Ruſſia, in the country of the Samoiedes, ſituated on the river Soſſva, which falls into the Oby; and bounded to the north by the ſtraits of Waygats; on the eaſt by the Ural mountains; on the ſouth by the river Konda, and a large bay of the Frozen ocean, which runs into the land towards the ſouth, and ſeparates near the 66th degree of north latitude, into two parts, one of which is called the Obſkaia Guba, or bay of Oby, and the other Tazowſkaia Guba, or the bay of Tazow. Into the former the river Oby empties itſelf, and into the latter the Taz; and from theſe two rivers the bays derive their names. This diſtrict was added to the Ruſſian empire by the czar Gabriel, in 1530, long before the other parts of Siberia were conquered. The town of Bereſof is ſituated on the weſt ſide of the river Oby, 372 miles N. N. W. of Tobolſk. N. lat. 64°. E. long. 65° 14'. This diſtrict is famous for its gold mines, in the mineral mountains of Ural, opened in 1754, and affording annually 3, 4, 5, or 6, and in later years 7 or 8 pood of gold. From the commencement of the work, in 1754, till the year 1788, during an interval of 34 years, the quantity of about 120 pood has been generally gained, which, eſtimated in value, amounts to about 1,198,000 rubles, and after deducting the coſts, to above 480,000 net profit. Taking the gold and ſilver here obtained, according to its ſtandard in coinage, and balancing it with the expences paid in copper money, according to its true value, a profit accrues of nearly 800,000 rubles. Tooke's View of Ruſſia, vol. iii. p. 296.

Beresof is alſo a town of Ruſſia, in the government of Olonetz. N. lat. 64° 15'. E. long. 30° 34'.

BERETELSKO, a town of Poland, in the palatinate of Volhynia; 24 miles S. S. W. of Lucko.

BERETHALOM, or Birthelem, a ſpacious town of Tranſylvania, in the diſtrict of Weiſland, which is the reſidence of the Proteſtant biſhop. The church is ſeated on a high rock, and its vicinity produces good wine.

BERETZHAUSEN, a town of Germany, ſeated on the Laber, in the circle of Bavaria, and principality of Neuburg; 12 miles W. N. W. of Ratiſbon.

BEREWICHA, or Berewica, in our *Old Writers*, denotes a village or hamlet belonging to ſome town or manor, ſituate at a diſtance from it.

The word frequently occurs in Doomſday-book: *Iſte ſunt* berewiche *ejuſdem manerii*.

BEREZA, in *Geography*, a town of Poland, in the palatinate of Kiof; 30 miles W. of Bialacerkiew.—Alſo, a town of Lithuania, in the palatinate of Poleſia, and territory of Brzeck; 56 miles E. N. E. of Brzeck. In this place the Carthuſians have a convent.

BEREZEC, a town of Little or Red Ruſſia, in the palatinate of Chelm; 22 miles eaſt of Chelm.

BEREZEN, a river which runs into the Black ſea; 20 miles weſt of Oczakow.

BEREZENE, a town of Poland, in the palatinate of Volhynia. N. lat. 51° 45'. E. long. 25° 30'.

BEREZEUKA, a town of Ruſſia, in the government of Saratof, on the weſt ſide of the Volga; 124 miles S. of Saratof.

BEREZINA, or Berezyna, a river of Lithuania, which riſes in the palatinate of Polotſk, and runs into the Dnieper, in N. Lat. 52° 18'. E. long. 30° 55'. This river has been erroneouſly laid down, by ſome modern geographers, as forming the new boundary between Ruſſia and Poland.

Berezina, a town of Lithuania, in the palatinate of Minſk, near the ſource of the river of the ſame name; 43 miles N. E. of Minſk. N. lat. 54° 28'. E. long. 28° 30'.

BEREZINSKOI, a town of Siberia, on the north ſide of the Irtiſh; 40 miles E. of Tobolſk.

BEREZNA, a town of Ruſſia, in the diſtrict of Kargapol, ſeated on the river Onega. N. lat. 62° 18′. E. long. 38° 5′.

BEREZNE, a town of Poland, in the palatinate of Volhynia, near the river Slucz. N. lat. 51° 10. E. long. 26° 52′.

BEREZNIKI, a town of Lithuania, in the palatinate of Troki; 40 miles N.N.W. of Troki.

BEREZOF. See Bereſof.

BEREZOVOI, a fortreſs of Aſiatic Ruſſia, in the government of Orenburg, on the Uvelka, 240 miles eaſt of Ufa, and 68 S. E. of Tcheliabinſk.

BEREZOVSKOI, a fortreſs of Aſiatic Ruſſia, in the government of Orenburg, on the Ural, 140 miles E. N. E. of Orenburg.

BER-FISCH, in *Ichthyology*, a name given by the Germans to the *common perch*.

BERG, Matthys Vanden, in *Biography*, a painter of portrait and hiſtory, was born at Ypres in 1615, and, as one of the diſciples of Rubens, he obtained ſome diſtinction. In his drawing he was correct, and being aſſiduous in deſigning after the life, and after the beſt models, pictures of his own invention are uncommon; although excellent copies after the finiſhed pictures of his maſter are numerous. He died in 1687. Pilkington.

Berg, in *Geography*, a duchy of Germany, in the circle of Weſtphalia, called in Latin "Ducatus Montenſis," *berg* and *mons* being ſynonymous, and denoting mountain or hill, is bounded on the weſt and ſouth by the archbiſhopric of Cologn, from which it is ſeparated by the Rhine; on the north by the duchy of Cleves; and on the eaſt by Naſſau-Siegen, the duchy of Weſtphalia, and the county of Mark. It is about 72 miles long, and from 10 to 26 in breadth. The country, which upon the whole is mountainous, is, nevertheleſs, along the Rhine flat, very fertile, and produces corn in abundance; on the hills the inhabitants cultivate vines, and the higher tracts are covered with extenſive foreſts; and the vallies afford excellent paſture. In this duchy there are mines of lead, iron, and coal; its principal manufactures are ſwords, knives, and other articles of iron and ſteel; and alſo thoſe of cloth, ribbands, and handkerchiefs. The principal rivers are the Rhine, which flows to the eaſt of this country, the Wipper, the Sieg, and Ruhr. Its capital is Duſſeldorf; and its other principal towns are Elberfeld, Gemark, Lennep, Rattingen, and Solingen. Hoeck computes the number of inhabitants to be 261,504. Render (Tour, vol. ii. p. 294.) ſays, that this duchy contains 9 cities, 8 market towns, 35,942 hearths, 202 churches, 44,646 Calviniſts, 36,807 Lutherans, and 1,300 Jews: and he adds, that this duchy, and that of Juliers, contain a number of manufacturers, who are computed to be about 150,000. The duchy of Berg belonged to the elector palatine; but in the year 1795, it was entirely over-run by the French. See Juliers.

Berg. See Berghes.

Berg *Reichinſtein*, or *Kaſchperſki Hory*, a royal town of Bohemia, in the circle of Prachalitz, ſeated on a mountain, in which are mines of ſilver, 20 miles W. of Prachalitz.

BERGA, a town of Norway, 60 miles E. N. E. of Chriſtiana. N. lat. 59° 50′. E. long. 9° 38″.—Alſo, a ſmall town of Spain, in Catalonia, ſeated on the river Llobregat.—Alſo, a town of Germany, in the circle of Neuſtadt, and prefecturate of Weyda, ſeated on the Elſter, 5 miles W. of Weyda.

BERGAMASCO, or Bergamo, a country of Italy, being part of Lombardy, and belonging to the ſtates of Venice, is boundedon the north by the Valteline, on the eaſt by the Breſciano, on the ſouth by the Cremaſco, and on the weſt by the Milaneſe. It extends about 36 leagues from north to ſouth, and 30 from eaſt to weſt. Towards the north it is mountainous and uncultivated, but the vicinity of Bergamo, its capital, is fertile. Some of its vallies produce wine and oil; others are barren. In the mountains are mines of iron, and quarries of marble and of ſtones. The inhabitants are inclined to corpulency, and are ſubject to the goitre; nevertheleſs, they are induſtrious, and intelligent in commerce, and carry on a conſiderable traffic in iron, wool, carpets, and tapeſtry, which they manufacture; cattle, marble, and mill-ſtones. Their language is a very corrupt Italian. Bergamaſco now belongs to the Ciſalpine republic.

BERGAMO, James Philip de, in *Biography*, an Auguſtin monk, was born at Bergamo in 1434, and wrote a "Chronicle" in Latin, from the creation of the world, to the year 1503, and "Treatiſe of Illuſtrious Women." He died at the place of his nativity in 1518. Gen. Dict.

Bergamo, anciently *Bergomum*, in *Geography*, a fortified city of Italy, and capital of Bergamaſco, is ſeated on ſeveral hills, at the bottom of which are ſome handſome ſuburbs. Between the city and the ſtrong caſtle on the mountain, is a ſubterraneous communication. Bergamo is the ſee of a biſhop, ſuffragan of Milan, and contains 13 pariſh churches, 12 convents for men, 10 for women, and about 30,000 inhabitants. The old church, of mingled Gothic and Grecian architecture, contains ſeveral valuable pictures, and deſerves notice. It is a place of conſiderable trade, and has a large fair on St. Bartholomew's day, which is reſorted to by a great number of merchants from other parts of Italy, Germany, and Swiſſerland. The principal articles of commerce are wool and ſilk; and the ſerges and tapeſtry of this place have been celebrated. Their ſilks equal thoſe of Turin. The inhabitants are diligent and active, and by their induſtry render fertile the ſandy environs of the town. Bergamo is 25 miles N.E. of Milan, and 26 N.W. of Breſcia. N. lat. 45° 42′. E. long. 9° 38′.

Bergamo, a name given by the Turks to the ancient Pergamus.

BERGAMOT, in *Botany*, *cedrat* or *bergamot citron-tree*, the Citrus *mella-roſa* of Lamarck, and a variety of the Citrus *medica* of Linnæus. It is diſtinguiſhed from the common citron-tree by its leaf, which has the odour of the roſe, by its fruit, which is red, and by the piſtil of its flower, which is ſhort. The fruit has a fine taſte and ſmell; and its eſſential oil is in high eſteem as a perfume.

Bergamot, *Oil*, or *Eſſence of*, is a fragrant eſſential oil procured from the outer rind of the bergamot orange, and prepared in a very large quantity for the table and perfumery in the ſouth of France, and eſpecially in Italy and Sicily. There are ſeveral other ſpecies of oranges uſed for this purpoſe, but the bergamot is eſteemed the moſt fragrant.

As the oil exiſts pure and ready formed in the orange peel, being ſimply depoſited in ſmall cells, the extraction is very eaſy. There are two methods of procuring it, either by diſtillation, as with all other eſſential oils, (for which, ſee the article Oil *Eſſential*) or by expreſſion. The latter is in ſome reſpect the beſt, as the oil is not liable to be altered by heat. Seſtini relates, that in Sicily a vaſt quantity of the oil is procured ſimply by ſqueezing the peel in the hand, and holding a ſmall piece of ſponge to the ſurface, which imbibes the oil as faſt as it flows out: when the ſponge is full, its contents are preſſed out into a veſſel in which the oil is collected. It is not eaſy to imagine a more indolent and inartificial method: but in Italy, and the ſouth of France, the orange peels are firſt torn to pieces on a ſmall machine ſtuck over with nails, with the points projecting,

like a carding mill, whereby they are entirely torn to pieces, from which much of their oil flows out on the small mill, and is conducted away by a channel cut for the purpose, leading to a large bottle, where it is collected. After this, the peel, now in a pulpy state, is strongly compressed between two plates of glass, and the remainder of the oil is forced out. This last being mixed with the other parts of the pulp, is at first turbid, but gets clear by repose.

These expressed essential oils, or as they have sometimes been distinguished by the term *essences*, are more fragrant than the oils prepared by distillation, but being mixed with a little mucilage, they are somewhat thicker, and do not keep quite so long as the distilled. The Sicilian method of preparing the essence by hand, though attended with great waste of materials, certainly affords a purer oil, than where a mill and press are used.

If the pulp, remaining after pressure, is mixed with spirit of wine and distilled, an addition of water to the distilled spirit separates an additional quantity of the oil, and leaves the liquor highly flavoured with its exquisite scent.

Beaumé obtained two ounces of the oil by distillation, from two pounds of the peel of lemons, and probably the bergamot is yielded in somewhat similar proportion. Beaumé. Murray.—Encycl. Arts. & Met. tom. vii.

There is likewise a kind of snuff of the same name, which is only clean tobacco, with a little of the essence rubbed into it.

Bergamot, in *Commerce*, is also the denomination of a coarse tapestry, manufactured with flocks of silks, wool, cotton, hemp, ox, cow, or goats' hair, and supposed to be invented by the people of Bergamo in Italy.

BERGANDER, in *Ornithology*, a name by which some have called the *shieldrake* or *burrough duck*, a very beautiful species of duck, common on the Lancashire, and some other coasts of England; but not in much esteem for eating. This is *anas tadorna* of Linnæus, which see.

BERGARA, in *Geography*. See Vergura.

BERGASE, a town of Romania, in European Turkey, seated on the Larissa. N. lat. 41° 22′. E. long. 27° 24′.

BERGBIETHEIM, a large market town of France, in the department of the Lower Rhine, and district of Dachstein.

BERGEN, Dirk Vanden, in *Biography*, was born at Haerlem, and was reckoned one of the best disciples of Adrian Vandervelde. His colouring is more glowing than that of his master; but his cattle, and other objects, are less correctly drawn. He spent some time in England; but not succeeding, returned to his own country, and for want of economy, died poor in 1689. Pilkington.

Bergen, Charles Augustus de, son of George Bergen, professor of medicine in the university of Frankfort on the Oder, was born Aug. 11, 1714. After being initiated by his father into the knowledge of anatomy and medicine, he was sent to Leyden, where he studied under Boerhaave and Albinus, and thence, to complete his education, to Paris and to Strasburg. In 1734, being thought qualified to assist his father, he recalled him to Frankfort, where he was made doctor, and the year following, professor in medicine. On the death of his father in 1738, he was promoted to the chairs of professor of anatomy and botany. With what zeal and ability he filled those offices, his numerous, learned, and ingenious dissertations on those subjects evince. In 1744, he was appointed to succeed Goelicke as reader in therapeutics and pathology, which post he filled to the time of his death, October 7, 1760.

His works, consisting chiefly of academical dissertations, were collected by Haller, and published with his "Theses Anatomicæ." The titles of a few of them follow. For the remainder, see Bib. Anat. et. Botan. Haller. "De nervo intercostali," 1731; "Icon nova ventriculorum Cerebri," 1734; "Methodus Cranii Ossa differendi, et machinæ hunc in finem constructæ per figuras, ligno incisas, delineatio," 1741; "Flora Francofurtuna, facili modo elaborata, &c." 1750.

Bergen, or *Berghen*, in Latin *Berga*, in *Geography*, the capital of Norway, and of the province of Bergenhuys, was founded in the year 1069 or 1070. It is a sea-port town, seated in the middle of a valley, and forming a kind of semicircle round a small gulf of the sea, called by the inhabitants Waag. On the land side it is defended by high mountains, constantly overhung with clouds, which descend upon the town in frequent rains; and towards the sea by several fortifications. All the churches and public edifices, as well as many of the dwelling-houses, are built of stone. The most remarkable buildings are the castle, and the cathedral school, founded in 1554. This city carries on a large trade in all kinds of fish, fish-oil, tallow, tar, hides, and timber, which are brought from the northern parts of the kingdom, and exported from hence. The returns consist chiefly in corn and foreign commodities. Bergen was formerly connected with the Hans-towns, and enjoyed the privilege of coining till the year 1575. The origin of its commerce was owing to the merchants of the Hanseatic league; fifty-eight storehouses are still to be seen on the quays, which were established by those merchants for the convenience of their exportation of fish. They had also a particular court here, the decisions of which tended to exclude the native inhabitants from all share in the trade; but they were at length entirely expelled, chiefly by the vigour of a bailiff, Walkendorf. This city, being chiefly constructed of wood, has been subject to frequent conflagrations, as in 1428, when eleven parish churches were entirely consumed, and also in 1472, 1623, 1640, 1702, 1756, and 1771, on which last occasion, the flames, it is said, were visible in the isles of Shetland, or at least, the red reflection in the sky. It has now only four parish churches, three Danish, and one German, together with some private chapels. The population is computed at 19 or 20,000. The harbour is reckoned one of the best in Europe. Bergen possesses a very laudable institution for the encouragement of the useful arts. N. lat. 60° 23′. E. long. 5° 33′.

Bergen, Berghen, or Bergenhuys, the most westerly province of Norway, situate between Aggerhuus and the northern ocean. It is about sixty leagues long, and 7 wide. Its capital is Bergen. This province, or diocese, is very populous, and is remarkable for having 7 marble quarries. It includes 7 vogteys or districts, and the same number of provostships. The vogteys are Haardanger, Sundhard-Lehn, Nord-hord Lehn, Sogn, or Sygna-Filke, Suadfiord, Nordfiord, and Sundmor.

Bergen, a county of America, in New Jersey, on Hudson river, lies opposite to New York on the east, and was first planted by the Dutch from New York. It is a mountainous country, and its extent is about 30 miles long and 25 broad; forming part of the eastern and northern extremities of the state, and at its north-western extremity meeting the north-eastern part of Sussex county. Bergen contains 6 townships, the chief of which are Bergen and Hackinsack, and 12,601 inhabitants, including 2301 slaves. Here are 7 Dutch Calvinist churches, and 2 of Dutch Lutherans.

Bergen is the shire town of the above county, and lies surrounded by water, except on the north. It is separated by the Hudson river, from New York, at the distance of 3 miles; on the south, a narrow channel lies between it and Staten island; and on the west, it has Hackinsack river. The inhabitants are chiefly descendants of the Dutch settlers.

Bergen *Neck*, is the ſouthern extremity of the above townſhip.

Bergen, a town of Germany, in the circle of the Upper Rhine, and principality of Hanau Munzenberg. The environs produce excellent wine.—Alſo, a town of Germany, in the circle of Upper Saxony, and capital of the iſle of Rugen; its ancient name was *Gora*. It is ſituated in the centre of the iſland, where are held the tribunals of Swediſh Pomerania. N. lat. 54° 28′. E. long. 13° 40′.

Bergen on *the Dumme*, a town of Germany, in Lower Saxony, and principality of Zell, 12 miles S. W. of Danneberg.

BERGENHUYS. See Bergen, *ſupra*.

BERGEN-OP-ZOOM, a ſea-port town of Dutch Brabant, ſeated on an eminence, in the middle of a moraſs, near the eaſtern ſhore of Zoom, at its junction with the Scheldt. It was firſt ſurrounded by a wall in 1287, by the firſt lord of the town, and erected into a marquiſate by the emperor Charles V. in 1533. The church, which is a beautiful ſtructure, was made collegiate in 1442. The houſes are well built, and the market places and ſquares handſome and ſpacious. It has a good tract of land under its juriſdiction, with ſeveral villages, and ſome iſlands in the Scheldt. This place, naturally ſtrong on account of the moraſſes that ſecure it, was regularly fortified in 1629, and eſteemed nearly impregnable. The fortifications are reckoned the maſter-piece of that great engineer Coehorn. It was unſucceſsfully beſieged by the prince of Parma in 1588, and alſo by the marquis of Spinola in 1622. In 1746, the marechal Saxe deputed count Lowendahl to lay ſiege to it with 36,000 men; and after perſevering attacks, and a vigorous, obſtinate defence, in which many lives were loſt, it was ſurrendered to the French, who became maſters of the whole navigation of the Scheldt. At the peace of Aix-la-Chapelle, it was reſtored to the Dutch. It is diſtant 18 miles N. N. W. from Antwerp. N. lat. 51° 30′. E. long. 4° 15′.

BERGENTE, in *Ornithology*, one of the names of *anas marila*. (Scaup. Duck.) *Bloch, beſch derberl naturf. &c.*

BERGERA, ſo called from Chriſt. Joh. Berger, profeſſor at Kiel, in *Botany*, Auth. D. Konig. Lin. gen. Schreb. n. 718. Claſs and order, *decandria monogynia*. Gen. Char. *Cal.* perianth, five-parted, very ſmall, acute, ſpreading, permanent. *Cor.* petals five, oblong, bluntiſh, ſpreading. *Stam.* filaments ten, five alternately ſhorter; anthers round. *Piſt.* germ roundiſh, ſuperior; ſtyle filiform, club-ſhaped; ſtigma turbinate, ſhining, with tranſverſe grooves. *Per.* berry ſubglobular, one-celled. *Seeds* two.

Eſſ. Char. *Cal.* five-parted. *Pet.* five; *berry* ſubglobular, one-celled, with two ſeeds.

Species, 1. B. *Koenigii*. Lin. Mantiſſ. 563. A leafy tree, with the bark of alder. A native of the Eaſt Indies. Martyn.

BERGERAC, in *Geography*, a town of France, and principal place of a diſtrict, in the department of the Dordogne; beautifully ſituate in an extenſive plain on the Dordogne, which divides it into two towns, called "St. Martin," and "St. Magdelaine." It is a rich, commercial, and populous town, containing about 8540 inhabitants. In the canton are 14,140. The territorial extent comprehends 175 kiliometres, and the number of the communes is 12. Before the revocation of the edict of Nantes, it is ſaid there were 40,000 Proteſtants in this town and neighbourhood. N. lat. 44° 51′. E. long. 0° 37′.

BERGFINK, in *Ornithology*, the name of *fringilla montifringilla*, in the Hiſt. Birds. *Friſch, ſander naturf. &c.*

BERGGANS, (Kolbe) the mountain gooſe, *anas montana*. Gmelin.

BERGGIEFZHUBEL, or Berg Gieshubel, in *Geography*, a town of Germany, in the circle of Upper Saxony, and margraviate of Meiſſen, near which are warm medicinal ſprings, 6 miles ſouth of Pirna.

BERGH, or Bergland, an iſland in the Indian ſea, north of Naſſau iſland, and ſouth-weſt of the iſland of Sumatra. S. lat 2° 50′. E. long. 100°.

BERGHEIM, a town of Germany, in the circle of the Upper Rhine, and county of Waldeck, and by the new French diſtribution, the chief place of a canton, in the department of Roer, and diſtrict of Cologne, containing 469 inhabitants, and the population of the canton is eſtimated at 10,365, diſtributed in 44 communes; 4 miles S. E. of Waldeck.

BERGHEM, in *Biography*. See Berchem.

BERGHIRI, in *Geography*, a town of Aſia, in the province of Kurdiſtan, 70 miles S. E. of Betlis.

BERGHMOT, or Bergmote, vulgarly barmote, formed from the Saxon *berg*, *mons*; and *mote*, *conventus*, *aſſembly*, or *meeting*. See Barghmote.

BERGLAX, in *Ichthyology*, one of the ſynonymous names of *corphæna rupeſtris*. Ström. Söndm.

BERGIA, ſo called from P. J. Bergius, M. D. profeſſor of natural hiſtory at Stockholm, in *Botany*. Lin. gen. Reich. p. 631. Schreb. 791. Juſſ. 301. Claſs and order, *decandria pentagynia*. Nat. Ord. *Succulentæ*. *Caryophylleæ*, Juſſ. Gen. Char. *Cal.* perianth, five-parted, ſpreading; leaflets lanceolate, permanent. *Cor.* petals five, oblong, ſpreading, the length of the calyx. *Stam.* filaments ten, briſtle-ſhaped, of middling length; anthers roundiſh. *Piſt.* germ roundiſh, ſuperior; ſtyles five, very ſhort, approximating; ſtigmas ſimple, permanent. *Per.* capſule ſimple, ſubglobular, mucronate, with five little ſwellings, five-celled, five-valved; valves ovate, flat, opening along the furrows, permanent, ſpreading very widely. *Seeds* numerous, minute.

Eſſ. Char. *Cal.* five-parted; *Pet.* five; *Capſ.* one, globular, with ſwellings, five-celled, five-valved; valves reſembling petals; *Seeds* very many.

Species, 1. B. *capenſis*. Lin. Syſt. 431. Reich. 2. 386. Suppl. 243. Mant. 241. Pola-tsjira, Rheed. Mal. 9. 153. t. 78. "Leaves lanceolate, or elliptic, flowers in whorls." This has the ſtature of Ammonia. A native of Tranquebar, in the Eaſt Indies, and therefore miſnamed *Capenſis*. The valves of the capſule, continuing after it is ripe, form a kind of five-petalled wheel-ſhaped flower. 2. B. *glomerata*. Lin. Syſt. 431. Suppl. 243. "Leaves obovate, crenulate, flowers glomerate." Found at the Cape of Good Hope by Bergius. Martyn.

BERGIER, Nicholas, in *Biography*, was born at Rheims in 1557, and became profeſſor of the univerſity in his native city, where he was educated for the law, and became ſyndic. Under this character he viſited Paris, and there formed an intimate friendſhip with Peireſc, and du Puy, by whom he was induced to execute a work which he had projected on the high roads of the empire. M. de Bellievre took him to his houſe, and procured for him a penſion, with the brevet of hiſtoriographer. He died in 1623. The principal of his works are his "Hiſtoire des grand chemins del'Empire Romain," firſt printed in 1622, 4to. and reprinted, with notes, at Bruſſels, in 2 vols. 4to. in 1729. This valuable work was tranſlated into Latin by Henninius, and is included in the 10th volume of Grævius's Roman Antiquities. Bergier alſo wrote in French "A ſketch of the Hiſtory and Antiquities of Rheims, with curious remarks concerning the eſtabliſhment of the people, and the foundation of the towns of France," 4to. 1635.

BERGIMUS, in *Ancient Mythology*, a deity peculiar to the inhabitants of Breſcia, in Italy, where he had a temple, and an order of prieſts. Gruter, Muratori, and Spon, have recorded many inſcriptions relating to this deity. It is thought that he was the god of the mountains, becauſe *berg*, in Celtic, ſignifies a mountain.

BERGMANN, Torbern, in *Biography*, professor of chemistry at Upsal, was born at Catherineberg, in West Gothland, March 20th 1735; and after having finished the first course of his education, entered at the university of Upsal. His application, particularly to the study of mathematics and natural philosophy, was so intense, that his health was endangered; and as these sciences afford no peculiar prospect of emolument, a relation, who had the charge of him, discouraged his prosecution of them, and rendered it necessary for him to conceal the books which assisted him in his favourite studies. At the close of a year his health was so much impaired, that the restoration of it required an intermission of his application, and a course of exercise, which obliged him to return to his family. His hours of relaxation were, however, occupied in the study of botany and entomology, and his discoveries in the last of these sciences were communicated to Linnæus. As soon as his health was re-established, he returned to the university, with ample permission to pursue those studies which were most agreeable to his inclination. Besides mathematics and natural philosophy, he directed his attention to natural history, under the patronage of Linnæus; and began with a memoir on the nature of the substance found in certain waters, and called coccus aquaticus, which he found to be the egg of a leech, including 10 or 12 young. This was followed by other memoirs on the history of insects which attack fruit-trees, and the means of preventing their ravages; and he proposed a method of classing these insects from the form of the larva, in which state the destruction of noxious insects is most essential. About this time, the famous Swedish naturalist testified his esteem of Bergmann's character and talents, by giving his name to a new species of insects. In 1761, Bergmann was appointed professor of mathematics and natural philosophy in the university of Upsal; and both before and after this time he enriched the volumes of the Swedish acts with several papers on philosophical subjects. His paper, containing "A Review of the several explanations which Natural Philosophers have given of the Rainbow," was published in 1759; and in 1760, he published some thoughts "On the origin of those meteors, which are not accompanied by any sensible sound or explosion," and also "On the opinions held by Philosophers relating to the Twilight," to which is prefixed an account of Mairan's "Anticrepusculum," or that of the horizon opposite to the sun. In 1761, and in 1762, professor Bergmann wrote on the subject of electricity, in consequence of a correspondence with Mr. Wilson; and particularly on the electrical quality of Iceland crystal, and double refracting spar. His remarks on the tenthredo, or saw-fly, shewing how to distinguish between the caterpillars of this insect and those of the butterfly and moth, and discovering the feet in the latter to be never more than 16, and those of the tenthredo always exceeding that number, were published in 1763; and the same year produced the unsatisfactory result of some electrical experiments, made with silk of various colours. In 1764, the professor wrote a paper to ascertain, from a number of observations, the height in the atmosphere at which the aurora borealis exists (see Aurora *Borealis*); and in 1765 and 1766, he wrote again on electrical subjects; and principally on the property and laws of electricity in the tourmalin, which had been referred to his examination by the Royal Academy of Sciences at Stockholm. At this time it does not appear that the subject of chemistry had employed much of Mr. Bergmann's attention; however, in 1767, on the resignation of Wallerius, he was chosen to succeed him as professor of chemistry and metallurgy. This appointment was much opposed by the party of the former professor, united with others who envied Bergmann's rising merit; and their opposition was supported by some severe criticisms on two papers, which the professor published at this time, relating to the depuration of alum, in which he recommends the use of argillaceous earth, and proposes tobacco-pipe clay, instead of alkali, to free it from the vitriol. But the prince royal of Sweden, who afterwards succeeded to the throne, and who was then chancellor of the university of Upsal, determined the dispute, and fixed him in the professor's chair. With enlarged views of the practical importance and utility of chemistry, of what had already been performed in this department of science by preceding authors, and of what yet remained to be done, Bergmann prosecuted his chemical researches, and by a combination of experimental analysis with mathematical reasoning, he extended and improved this science by a variety of valuable discoveries and observations. In order to pursue his experiments and inquiries with the greater facility, and to communicate the result with advantage to his pupils, he formed, near his laboratory, a cabinet, in which all the mineral substances were ranged in order, together with the products of those experiments which had ascertained their composition. Another collection exhibited all the minerals of Sweden, arranged according to the places where they are found. In a third, were exhibited models of the various machines and apparatus by means of which these substances were converted into useful articles, which articles were placed near the materials from which they were formed. From this systematical arrangement Bergmann derived peculiar advantage in his profession as a teacher. While he excelled as a professor of chemistry and mineralogy, and devoted much of his time to this occupation, he was actively and incessantly employed in making discoveries which have placed him in the first rank of philosophical chemists. He examined the carbonic acid, discovered by Black, and denominated fixed air, in its several properties and habitudes. Nickel, manganese, the magnesian earth, and barytes, which were newly-discovered substances, were particularly investigated by Bergmann, and afforded materials for regular and perspicuous treatises. The acid obtained from sugar, and many other vegetables, by the abstraction of the nitric acid, and those acids which are obtained from arsenic, molybdena, fluor spar, and tungsten, were discovered either by himself or some of his disciples; and to him we are indebted for leading the way in the investigation of their properties, and for ascertaining many interesting phenomena attending their combinations. From him we learn, that iron contains a number of foreign admixtures, chiefly of a metallic nature, and that the three states of crude iron, and malleable iron, and steel, principally depend upon the greater or less abundance of carbon. In his analysis of waters, he added, to the re-agents before used, other substances more effectual, and whilst he evinced the imperfection of this method, he rendered it much more accurate. He also ascertained the quantities of products, without separating them from all their combinations; and in this way he infers the quantity of metal from the weight of precipitate it affords, by the addition of an alkali, or some other known substance, from tables founded on former experiments. He likewise analysed the precious stones, known by the name of gems, and devised peculiar methods for separating them into the known earths in determinable proportions. Professor Bergmann evinced the necessity and utility of performing docimastic operations in the humid way, or by an analysis, in which liquid solvents are used; and he also exhibited the advantages of the process by fire, applied to materials in minute portions, by means of the blow-pipe, either upon a piece of charcoal, or in a spoon of pure silver. This mode of examining mineral substances, united with that of the habitudes which they exhibit, with a few simple re-agents, facilitated the classification of them, according to their chemical properties; a method adopted by this ingenious chemist, without

out the exclusion or disparagement of that method of investigation which regards the external character. This appears from his short essay on the forms of crystals. The subject of elective attractions engaged the particular attention of professor Bergmann; and he engaged in the laborious undertaking of improving and extending the tables of Geoffroy, for which he perceived that, according to his views, no less than 30,000 experiments would be necessary. He therefore, under an apprehension that his life would not allow the completion of his plan, contented himself with publishing, what appeared to him to be an imperfect work, though it was otherwise regarded by the scientific world. His table of simple affinities is the first, that exhibits the laws of affinities as they are observed in the dry way; and in his scheme it is seen at once whether the operation takes place in the humid or dry way; what are the substances presented to each other; their component parts and proportions; the numerical expressions of their attractions; what new compounds take place; and whether they fall down, or sublime, or remain in solution, and which of them are thus respectively affected. (See AFFINITY.) In this work, as well as in his work on metallic precipitates, Bergmann, not apprised of those effects of oxygen, which have been developed in later times, considers the existence of phlogiston, or a common principle of inflammability, as an acknowledged truth. He also admits of the matter of heat as a self-existent independent principle, and seems not to have apprehended that it may be a distinct modification. Accordingly, these two principles enter into many of his explanations of facts; but in all those explanations, the matter is arranged with such order and perspicuity, that it is extremely easy to substitute the absorption of oxygen instead of the extrication of phlogiston, and the contrary effect wherever the latter imaginary principle, as it is now thought to be, is absorbed. The life of professor Bergmann, like that of other studious and scientific men, admits of little variety. Attentive to the duties of his profession, he resided constantly at Upsal, and had the honour to be elected rector of the university, which in his time was divided into two parties, of theologians and civilians on one side, and of natural philosophers on the other, between whom Bergmann maintained peace and equality. The king of Prussia wished to engage the professor of Upsal to become a member of his academy, and to remove to Berlin; but attached to his office, though exhausted by it, and in a declining state of health, which might have been relieved by a warmer climate, and under obligations of gratitude to Gustavus, king of Sweden, who had been his benefactor, and who had honoured him with the order of Vasa, he declined the proposal, and remained at Upsal. The disciples of his school, of whom the celebrated Scheele sustained a very distinguished rank and character, reflected honour on their master, who never failed to encourage their researches, and to mention their discoveries in terms of approbation and respect. How much sir Torbern Bergmann was esteemed whilst he lived, in every part of Europe, it is needless to say; and of his works it is sufficient to observe, that, notwithstanding the rapid improvements which have taken place since his time in chemical science, they will long remain repositories of facts and reasoning, to which every philosopher must recur. When it is considered that he began this pursuit rather at a late period of life, and that he made his various discoveries in the course of 17 years, and that he died before he attained his 50th year, his death will be regretted as a premature event, by which society sustained a very considerable loss. He died on the 8th of July 1784, at the baths of Medwi in Sweden. His works were very numerous; the principal of them are as follows: viz. "Opuscula physica et chemica, pleraque seorsim antea edita jam ab auctore collecta, revisa et aucta;" published in Latin in 3 vols. 8vo. in 1779, 1780, 1783, and translated by Dr. Cullen of Dublin, in 2 vols. 8vo. with illustrations and notes by the translator. "Meditationes de systemate fossilium naturali;" printed in the 4th volume of the Transactions at Upsal for 1784, and translated into English in 1788, in 8vo.; "Physick Beskrifnung oefoer Jordklotet," or physical description of the earth, in 2 vols. in which he has given lucubrations on the structure and form of the earth; "Essay on the usefulness of Chemistry," published in Swedish in 1779, and translated into English in 1783, 8vo.; two academical dissertations on the origin and progress of chemistry, intitled "De Primordiis Chemiæ," in 1777, and "Chemiæ Progressus a medio Sæc. vii. ad medium Sæc. xvii." in 1782; and "Sciagraphia Mineralis," or outlines of Mineralogy, first printed in 1782, at Leipsic and Dessau, and translated into French by M. Mengez, and into English by Dr. Withering in 1783, 8vo. Eloge of Bergmann, inserted in the Acts of the Academy of Sciences at Paris for 1784. Coxe's Travels in Sweden, &c. vol. iv. p. 228, &c. Gen. Biog.

BERGMANNIA, in *Entomology*, a species of PHALÆNA (*Tortrix*), with pale yellow wings, spotted with bright yellow; fasciæ whitish, and the third bifid; found in the gardens of Germany and northerly parts of Europe.

BERGOO, in *Geography*, a district of Abyssinia, situate north of Darfur, and south of Bornou, between 15° and 19° of N. lat. and between about 24° and 27° 31′ E. long. Its capital is Wara, in N. lat. 15° 30′. E. long. 25° 30′. Bergoo is said to be 15 days or (allowing 12½ geographical miles per day) 187½ geographical miles in extent, from E. to W. and from N. to S. 20 days, or 250 miles. Within about a day's journey of Wara, are said to be eight large mountains, the inhabitants of each of which use a distinct language. They are Mahometans, zealously attached to the faith; and read the Koran daily. They are said to be brave, and furnish the armies of the sultan of Bergoo with recruits as often as they are required. They make war by sudden incursions, traversing and laying waste a large space in a short time. On these occasions they leave their women behind, and are therefore better adapted to military operations than the people of Darfur, who never march without a host of female attendants. The people of Bergoo seldom make "selatea," i. e. an expedition to procure slaves by force. Some of the idolatrous nations, dependent upon Bergoo, are represented as conducting their wars in a very formidable manner. The combatants never retreat; and the women behind light a fire, in which they heat the heads of the spears, and exchange them for such as are cooled in the combat. They also use poisoned weapons. Mr. Browne informs us, that in a remote part of the pagan country, from which slaves are brought, the inhabitants eat the flesh of prisoners taken in war. They are also habituated to strip off the skin of the hands and faces of their slaughtered foes, which, after undergoing some preparation, is worn as an emblem of triumph. Their arms, which are a spear and a javelin, are formed of iron, wrought by themselves. These they make red-hot, and stick the point in a tree, where they leave them till the juice is dried; and in this manner, according to report, they acquire a most deadly poison. Browne's Travels in Africa, p. 310. 468.

BERGSNYLTRA, in *Ichthyology*, the name under which Linnæus mentions *Labrus suillus* of Fn. Suec. in Jt. Wgoth. 179.

BERGSPERLING, in *Ornithology*, the name of *Fringilla montana* in Frisch. birds.

BERGSTADT, in *Geography*, a town of Moravia, in the circle of Olmutz, 18 miles north of Olmutz.

BERGSTRASS, a long tract or tongue of land, on the side of the Rhine, between Heidelberg and Darmstadt. It contains

contains a few small places as Bensheim, Oppenheim, and Weinheim. It has in it a highway, commanding prospects of wide extent. The best part of this continued chain of hills is from Heidelberg to Bensheim, where it is about 8 leagues long and four broad. On the right hand it is covered with woods near the top, and nearer the plain with vineyards. The level road is planted with rows of walnut trees, and on each side are fields and meadows that are very fertile. The walnut trees of Bergstrass and the Odenwald yield a considerable profit to the country by the wood and the fruit; and the wine produced there is an inexhaustible source of supply to the inhabitants. In one year they have exported 40,000 rough made walnut tree musket stocks, from these parts to Saxony. From the nuts they make an excellent oil, which serves the common people instead of butter, and the inferior sort is used for lamps. The almond trade, of which great quantities grow along the Bergstrass, is very considerable. The warmth of the climate, and goodness of the soil in the Bergstrass, are such, that after rye-harvest the land may be sown a second time with spelt, buck-wheat, or oats, which are always reaped the same year.

BERGUES, or Berg, or Bergues *St. Vinox*, a town of France, and principal place of a district, in the department of the North; so called from St. Vinox, a Flemish lord, who lived here. It is seated on the river Colme, at the union of several canals, which pass to Dunkirk, Gravelines, St. Omer, Furnes, &c., and contains two parishes. Berg was the last town of West Flanders which held out for the Dutch in the 16th century. It was taken by the French in 1658, and confirmed to them by the peace of the Pyrenées in the following year. Since that time it has been fortified by new works, and the country round it may be laid under water by means of sluices; 1½ league south of Dunkirk. It contains 5085 inhabitants, and in the canton are 14,026. The territorial extent comprehends 130 kiliometres, and 13 communes. N. lat. 50° 57′. E. long. 2° 35′.

BERGUN, a small town of Switzerland, in the country of the Grisons, near a river which flows from a lake of the same name, and discharges itself into the Albula. It lies between the Albula and the Inn, about 6 miles from the latter, and 12 miles from the former. N. lat. 46° 31′. E. long. 3° 55′.

BERGWERBEN, a town of Germany, in the circle of Upper Saxony, two miles north of Weissenfels.

BERGWERK, a town of Hungary, 13 miles west of Steinam.

BERG-ZABERN, a town of Germany, in the circle of the Upper Rhine, and duchy of Deux Ponts, seated on the Erlbach, 30 miles south-east of Deux-ponts. By the new arrangement of the French, it is the chief place of a canton in the department of the Lower Rhine, and district of Wissembourg, containing 1947 inhabitants. The canton has 9005; its extent is 150 kiliometres, and the communes are 15. N. lat 49° 7′. E. long. 7° 32′.

BERIA, Berie, Berry, in *Middle Age Writers*, denotes a large open field; and the cities and towns of England, which end with that word, are built in plain and open places, and do not derive their names from boroughs, as sir Henry Spelman imagines. That the word "beric," which has been confounded with "bury," and "borough," is a flat wide campaign, is proved from sufficient authorities, by the learned Du Fresne, who observes, that "Beria Sti. Edmundi," mentioned by Matt. Paris, sub. ann. 1174, is not to be taken for the town, but for the adjoining plain. Besides, many flat wide meads, and other open grounds, are called by the names of "berics," and "berry-fields;" thus the spacious meadow between Oxford and Ifley was in the reign of king Athelstan called "Bery;" and the largest pasture ground in Quarendon in the county of Buckingham is known by the name of "Beryfield." And though these meads have been interpreted demesne, or manor meadows, yet they were in reality any flat or open meadows, that lay adjoining to any vill or farm. (Cowel.) Hence also "berras assartare" signifies to dry or plough up heaths and downs; and hence our warrens are called "coney-berries."

BERIBERIA, or Beriberi, in *Medicine*, a barbarous term in the East Indies. It is called by some British authors, who have written on the diseases of hot climates, *the barbiers*. According to Bontius, it comes on with great weariness, trembling, numbness, and peculiar tingling sensation of the limbs, so that the patient is rendered incapable of walking, or otherwise using them. The upper as well as lower limbs are often affected. Sometimes it is accompanied with a faultering speech. Its attack is generally sudden. Those whom it afflicts are chiefly the lower class of people, who imprudently get chilled after being heated, by drinking cold water; but more especially by sleeping in the night air, after great fatigue or intoxication. The remedies against this obstinate complaint are strong frictions, aromatic fomentations, warm-bathing, and sudorific decoctions. According to Bontius, the most efficacious topical application is a species of naphthæ, or petroleum, from Sumatra, used as a liniment. The natives of India (says Dr. Lind) have a method of putting the patient into a hole dug into the ground, and covering him with sand up to his neck; this is done in the middle of the day, and he remains there as long as he can bear the heat of the sand, which is considerable. Camphire, and a decoction of guaic wood, have sometimes produced a good effect; also the expressed bitter oil of the mergoose, an Indian plant. But notwithstanding the use of the most powerful nervous medicines, the patient generally continues paralytic for some months, unless he is removed into another air.

On the Malabar coast (continues the last mentioned author) this disease is most violent and frequent, and attacks both natives and strangers, especially in the months of December, January, February, and March. During these months, the land winds blow every morning about sun-rise, from the neighbouring mountains, with remarkable coolness; and such as, being tempted by the serenity of the season, sleep exposed to these winds, are often suddenly seized with a very painful sensation in the periosteum of the arms and legs. In persons of a good constitution, this pain abates as the day advances, and as the air becomes warmer; but in others it continues for a considerable time, attended with a weakness of the knees, and uneasy sensations in the calves of the legs and soles of the feet, especially on any attempt to walk. This is scarcely ever cured by medicine, till after the shifting of the monsoon, unless the patients can be removed to the coast of Coromandel, or to any place to the eastward of the Balagat mountains, where, by the change of air, they quickly recover. See Bontius de Med. Indorum; and Lind on Diseases incidental to Europeans in Hot Climates.

BERICARIA. See Bercaria.

BERIEZEN, in *Geography*. See Beresina.

BERIGAN, a town of Africa, in the kingdom of Algiers, and capital of the country of Beni-Mezzab. N. lat. 32° 15′. E. long. 2° 59′.

BERINBAL, a town of Egypt, on the west branch of the Nile, 7 miles S. E. of Rosetta.

BERING, in *Biography* and *Geography*. See Behring.

BERINGEN, in *Geography*, a town of Germany, in the circle of Westphalia, and bishopric of Liege, 18 miles N.W. of Maestricht.

BERINGOU. See Behring's *Island*.

BERINSCHUL, a rocky island in the Mediterranean, near the coast of Algiers.

BERISA, a town of Africa, in Kassina, west of the town of Kassina, seated on the river Neel Abeed, or Guin. N. lat. 16° 45′. E. long 9° 10′.

BERITH, a simple mentioned in Scripture, used for cleansing, or taking out spots. Jerem. chap. ii. ver. 22. Some [illegible] of which soap is made; and Dr. Goldsworth, from the ashes others, after Rudbeck, make it to be the dye of the purple fish.

BERKA, in *Geography*, a town of Germany, in the circle of Upper Saxony, and principality of Weimar, on the Ilm; 6 miles S.S.W. of Weimar.—Also, a town of Germany, in the same circle, and principality of Eisenbach, on the Werra, 9 miles W. of Eisenbach.

BERKA, or Berku. See Barracoo.

BERKASZESTI, a town of European Turkey, in the province of Moldavia, on the Berbecz, 56 miles N.W. of Galatz.

BERKELEY, Dr. George, in *Biography*, the learned and ingenious bishop of Cloyne in Ireland, was born March 12, 1684, at Kilcrin, near Thomastown, in the county of Kilkenny; and having received his preparatory education at Kilkenny school, under Dr. Hinton, was admitted at the age of fifteen, a pensioner of Trinity college, Dublin, of which he became a fellow, June 9, 1707. In this year he published his first literary essay, written before he was 20 years of age, entitled "Arithmetica absque Algebra aut Euclide demonstrata," and evincing his talents for those subtile metaphysical studies, by which he was afterwards so eminently distinguished. In 1709 was published his "Theory of Vision," being the first attempt that was ever made to distinguish the immediate and natural objects of our senses from the conclusions which we have been accustomed from infancy to draw from them, and to trace the boundary that divides them. For this purpose he shews, that although habit hath connected the ideas of sight and touch, so that they are called by the same names, they have originally no such connection, insomuch that a person born blind, and suddenly made to see, would, at first, be unable to tell how any object that affected his sight would affect his touch, and from sight could not derive any ideas of distance or external space, but would imagine that all the objects he saw were in his eye, or rather in his mind. In proof of this assertion, the case of a young man born blind, and couched at the age of 14, by Mr. Cheselden, mentioned at the close of his anatomy, has been adduced. This work was succeeded in the following year by the "Principles of Human Knowledge," in which Berkeley controverted Mr. Locke's account of abstract ideas and general names, and attempted to prove that the commonly received notion of the existence of matter is false, and inconsistent with itself; that those things which are called sensible material objects are not external, but exist in the mind, and are merely impressions made upon our minds by the immediate act of God, according to certain rules, termed laws of nature, from which, in the ordinary course of his government, he never deviates; and that the steady adherence of the Supreme Spirit to these rules is what constitutes the reality of things to his creatures, and so effectually distinguishes the ideas perceived by sense from such as are the work of the mind itself, or of dreams; that there is no more danger of confounding them together on this hypothesis than on the common supposition of matter. See Abstraction, Body, Existence, and Matter.

In the year 1712, Berkeley's attention was directed, by the perusal of Locke's "Two Treatises of Government," to the doctrine of passive obedience; in support of which he printed the substance of three common-places or sermons, delivered in the college chapel. In consequence of this publication, he was represented as a Jacobite, and prevented from obtaining some preferment in the church of Ireland, to which he had been recommended; but the unfavourable impression that had been thus made on the mind of the prince of Wales, afterwards George II., was removed by Mr. Molyneux, who took occasion of introducing Berkeley to queen Caro- [illegible] he published, in London, a farther defence of his system of immaterialism, in "Three Dialogues between Hylas and Philonous." Such was the reputation which he had now acquired by his writings, for acuteness of parts, and a beautiful imagination, that his company was courted even by those who did not embrace his opinions; and he was introduced to the acquaintance of persons of rank and learning, by two gentlemen of opposite principles, sir Richard Steele, and Dr. Swift. For the former, he wrote several papers in the "Guardian," and at his house formed an intimacy with Mr. Pope, which lasted during his whole life. Dean Swift also introduced him to lord Berkeley of Stratton, and to other valuable acquaintance; and procured for him the appointment of chaplain and secretary to the earl of Peterborough, who being appointed ambassador to the king of Sicily, and to the other Italian states, took Berkeley with him, in November 1713. On his return to England, in 1714, he found that his hopes of preferment had expired with the fall of queen Anne's ministry; and he therefore accepted the offer of accompanying the son of Dr. Ashe, bishop of Clogher, in a tour through Europe. At Paris he visited the illustrious father Malebranche, whom he found in his cell, cooking, in a small pipkin, a medicine for an inflammation of the lungs, with which he was afflicted; and as they engaged in a conversation on Berkeley's system, Malebranche, in the heat of disputation, raised his voice so high, and indulged the natural impetuosity of his temper to such a degree, that he brought on an increase of his disorder, which carried him off a few days after, viz. October 13, 1715. During four years' absence from England, Mr. Berkeley not only prosecuted, what is usually called by travellers the grand tour, but he visited Apulia, Calabria, and Sicily. The materials he collected, with a view to the natural history of the latter country, were unfortunately lost in his passage to Naples; and this circumstance is the more to be regretted, as he has given to the world satisfactory specimens of his talent for lively description, in his letters to Mr. Pope and Dr. Arbuthnot. At Lyons, in his way home, he drew up a curious tract, "De Motu," which he sent to the royal academy of sciences at Paris, and which he committed to the press soon after his arrival in London, in 1721. The disastrous South Sea scheme of 1720, engaged his attention at this time, and he wrote "an Essay towards preventing the ruin of Great Britain," which was printed at London, in 1721. By his travels, his natural politeness, and his talents for conversation were so much improved, that he found easy access to the best company; and he was introduced by Mr. Pope to lord Burlington, who conceived for him a very high esteem on account of his distinguished taste and skill in architecture, which had been the object of his particular study in Italy. By this nobleman he was recommended to the duke of Grafton, lord-lieutenant of Ireland, and accompanied him thither in 1721. Having been elected senior fellow of his college in 1717, he now took the degrees of bachelor and doctor in divinity. By the death of Mrs. Vanhomrigh, the celebrated "Vanessa," to whom he was introduced by Dean Swift, in 1713, and who altered her purpose of making the dean her heir, in consequence of discovering his connection with "Stella," Dr. Berkeley became possessed of half her property, amounting to about 4000l. and in the discharge of his office, as one of her executors,

committed to the flames feveral letters that had paffed in correfpondence between her and the dean, not, as he declares, becaufe there was any thing criminal in them, but becaufe he obferved a warmth in the lady's ftyle, which delicacy required him to conceal from the public.

On the 18th of May 1724, Dr. Berkeley refigned his fellowfhip, and was promoted by his patron to the deanery of Derry, worth 1100l. *per annum*. Having for fome time conceived the benevolent project of converting the favage Americans to Chriftianity, by means of a college to be erected in the Summer iflands, otherwife called the ifles of Bermuda, he publifhed a propofal for this purpofe at London, in 1725, and offered to refign his own opulent preferment, and to dedicate the remainder of his life to the inftruction of youth in America, on the moderate fubfiftence of 100l. a year. Such was the influence of his diftinguifhed example, that three junior fellows of Trinity college, Dublin, concurred with him in his defign, and propofed to exchange, for a fettlement in the Atlantic ocean, at 40l. *per annum*, all their flattering profpects in their own country. The propofal was enforced on the attention of the miniftry, not merely by confiderations of national honour and a regard to the caufe of Chriftianity, but by the immedate advantage likely to accrue from it to the government. Having, by diligent refearch, eftimated the value of the lands in the ifland of St. Chriftopher's, ceded to Great Britain by France at the treaty of Utrecht, he propofed to difpofe of them for the public ufe, and thus to raife a fum of money, part of which was to be applied to the eftablifhment of his college. The fcheme was communicated by the intervention of the abbé Gualtieri, or Altieri, to king George I. and by the royal command introduced into the houfe of commons by fir Robert Walpole. A charter was granted by his majefty for erecting a college, by the name of St. Paul's college in Bermuda, which was to confift of a prefident and nine fellows, who were obliged to maintain and educate Indian children at the rate of 10l. *per annum* for each. The firft prefident, Dr. George Berkeley, and the firft three fellows named in the charter, thofe junior fellows of Dublin college abovementioned, were licenfed to hold their preferments in thefe kingdoms till the expiration of one year and a half after their arrival at Bermuda. The commons, in 1726, voted an addrefs to his majefty, praying a grant of fuch a fum to effect the above purpofe out of the lands of St. Chriftopher's already mentioned, as his majefty might think proper. The fum of 10,000l. was furnifhed by the minifter, and feveral private fubfcriptions were immediately raifed for promoting fo pious an undertaking. The dean having, in 1728, married the eldeft daughter of the right honourable John Forfter, efq. fpeaker of the Irifh houfe of commons, prepared to fet fail for Rhode ifland, in the execution of his fcheme, and took with him a pretty large fum of money of his own property, and a collection of books for the ufe of his intended library. Upon his arrival at Newport in Rhode ifland, he contracted for the purchafe of lands on the adjoining continent, and fully expected that the purchafe money would, according to grant, be immediately paid. His expectations, however, were difappointed; and after various excufes he was at length informed by bifhop Gibfon, at that time bifhop of London, in whofe diocefe the whole Weft Indies is included, that on application to fir Robert Walpole, he received the following blunt anfwer: "If you put this queftion to me," fays fir Robert, "as a minifter, I muft, and can affure you, that the money fhall, moft undoubtedly, be paid as foon as fuits with public convenience; but if you afk me as a friend, whether dean Berkeley fhould continue in America, expecting the payment of 10,000l. I advife him, by all means, to return home to Europe, and to give up his prefent expectations." Accordingly, the dean, after having expended a great part of his private fortune, and more than feven years of his life in the profecution of a laudable fcheme, returned to Europe. Before he left Rhode ifland, he diftributed the books he had brought with him among the clergy of that province, and upon his arrival in London, immediately returned all the private fubfcriptions that had been advanced for the fupport of his undertaking. In 1732, he publifhed the "Minute Philofopher," a work confifting of a feries of dialogues, on the model of Plato, in which he purfues the free-thinker through the various characters of atheift, libertine, enthufiaft, fcorner, critic, metaphyfician, fatalift, and fceptic, and employs feveral new arguments from his own fyftem. Of the company, which at this time attended the philofophical converfations that were carried on in the prefence of queen Caroline, according to a practice which had commenced when fhe was princefs of Wales, fome of the principal perfons were doctors Clarke, Hoadly, Berkeley, and Sherlock. The debates that occurred were chiefly conducted by Clarke and Berkeley; and Hoadly adhered to the former, as Sherlock did to the latter. Hoadly affected to confider the philofophy of Berkeley, and his Bermuda project, as the reveries of a vifionary. Sherlock, on the other hand, efpoufed his caufe; and on the publication of the "Minute Philofopher," prefented a copy of it to the queen, and left it to her majefty to determine, whether fuch a work could have been the production of a difordered underftanding. The queen honoured Berkeley with admitting him to frequent vifits, and took pleafure in his converfation on fubjects relating to America; and upon a vacancy in the rich deanery of Down in Ireland, procured it for him. But as lord Burlington had neglected to give proper notice of the royal intention to the duke of Dorfet, then lord-lieutenant of Ireland, and to obtain his concurrence, the duke was offended, and the appointment was not urged any farther. Upon this, her majefty declared, that fince they would not fuffer Dr. Berkeley to be a "dean," in Ireland, he fhould be a "bifhop;" and accordingly, upon a vacancy in the fee of Cloyne, in 1733, he was promoted by letters patent to that bifhopric. In confequence of this appointment, he refided continually at Cloyne, and devoted his time and attention to the faithful difcharge of all epifcopal duties. He revived in his diocefe the ufeful office of rural dean, vifited often parochially, and confirmed in feveral parts of his fee. In the profecution of his ftudies, however, his diligence was unabated; and about this time he engaged in a controverfy with the mathematicians of Great Britain and Ireland on the fubject of Fluxions. He was led to it by the following occurences: Mr. Addifon having vifited Dr. Garth in his laft illnefs, addreffed him feriouffly on the neceffity of preparing for his approaching diffolution; but the doctor replied, "Surely, Addifon, I have good reafon not to believe thofe trifles, fince my friend Dr. Halley, who has dealt fo much in demonftration, has affured me, that the doctrines of Chriftianity are incomprehenfible, and the religion itfelf an impofture." This converfation being reported by Addifon to the bifhop, he took up arms againft this redoubtable dealer in demonftration, and addreffed to him "the Analyft," with a view of fhewing that myfteries in faith were unjuftly objected to by mathematicians, who admitted much greater myfteries, and even falfehoods in fcience, of which he endeavoured to prove that the doctrine of fluxions furnifhed an eminent example. See FLUXION. In the courfe of the controverfy on this fubject, the bifhop, in 1735, publifhed a reply to Philalethes, fuppofed to be by Dr. Jurin, entitled "A Defence of Free-thinking in Mathematics." From this controverfy, he diverted his thoughts to fubjects of more apparent utility; and printed, in 1735, his "Queries," for the good of Ireland; in 1736, his "Dif-

courſe addreſſed to Magiſtrates;" and in 1750, his "Maxims concerning Patriotiſm;" all of which evince his knowledge of mankind, and his zeal for the ſervice of true religion, and of his country. In 1745, during the Scots' rebellion, he addreſſed a "Letter to the Roman Catholics" of his dioceſe; and in 1749, another to the clergy of that perſuaſion in Ireland, under the title of "a Word to the Wiſe," which was ſo well received by them, that they returned him their public thanks, with expreſſions of marked eſteem and reſpect, which deſcribe him as "the good man, the polite gentleman, and the true patriot." That he diſcovered this character in a very eminent degree, was very generally acknowledged, and particularly by lord Cheſterfield, who as ſoon as he was advanced to the government of Ireland, in 1745, offered him the ſee of Clogher, then vacant, and the value of which was double that of Cloyne. This offer the biſhop, moderate in his views, diſintereſted in his ſupport of government, and particularly attached to his cuſtomary place of reſidence at Cloyne, and to the connections and duties attending it, reſpectfully declined. Towards the cloſe of his life, he laboured under a nervous colic, the effect of his ſedentary courſe of living, in which he found conſiderable relief from the uſe of tar-water; and he therefore communicated his thoughts on this celebrated medicine to the public, in a treatiſe entitled "Siris, a Chain of Philoſophical Reflections and Enquiries concerning the Virtues of Tar-water," printed a ſecond time in 1747, and followed in 1752, by "Farther Thoughts on Tar-water," which was his laſt performance.

In 1752, he removed, with his lady and family, to Oxford, for the purpoſe of ſuperintending the education of one of his ſons, who was admitted a ſtudent at Chriſtchurch college, in that univerſity: but ſenſible in a high degree of the impropriety of non-reſidence, he endeavoured firſt to procure an exchange of his high preferment for ſome canonry or headſhip at Oxford; and failing of ſucceſs, he afterwards, by a letter to the ſecretary of ſtate, requeſted permiſſion to reſign his biſhopric, worth at that time not leſs than 1400l. *per annum*. When the petition for this purpoſe was preſented to his majeſty, he declared he ſhould die a biſhop in ſpite of himſelf, and gave him full liberty to reſide wherever he pleaſed. Before he left Cloyne, he ſigned a leaſe of the demeſne lands in that neighbourhood, renewable yearly at the rate of 200l. and directed this ſum to be annually diſtributed, until his return, among poor houſe-keepers of Cloyne, Youghall, and Aghadda. At Oxford he was highly reſpected by the members of the univerſity; but his reſidence among them was of no long duration. On Sunday evening, January 14, 1753, whilſt he was ſurrounded by his family, and his lady was reading to him one of Dr. Sherlock's ſermons, and alſo the leſſon in the burial ſervice, taken from 1 Cor. xv. whilſt he was commenting upon it, he was ſuddenly ſeized with a diſorder, called the palſy of the heart, and inſtantly expired. His remains were interred at Chriſtchurch Oxford, and a marble monument was erected to his memory by his widow, with a Latin inſcription, drawn up by Dr. Markham, head maſter of Weſtminſter ſchool, and now archbiſhop of York. In this inſcription he is ſaid to have been born in 1679, and his age to be 73; whereas his brother, who furniſhed the particulars of his life, ſtates the year of his birth to have been 1684, and of courſe he died at the age of 69.

The perſon of biſhop Berkeley was handſome, his countenance expreſſive and benign, and his conſtitution robuſt, till it was impaired by his ſedentary life. At Cloyne he conſtantly roſe between three and four in the morning; and often ſpent the greater part of the day in ſtudy; his favourite author, from whom many of his notions were borrowed, was Plato. The enthuſiaſm of his private character, which was ſingularly excellent and amiable, entered into his literary one: and it was manifeſted in his public works, as well as in his life and converſation. Few perſons were ever held, by thoſe who knew his worth, in higher eſtimation than biſhop Berkeley. When biſhop Atterbury was introduced to him, he lifted up his hands in aſtoniſhment, and exclaimed, "So much underſtanding, ſo much knowledge, ſo much innocence, and ſuch humility, I did not think had been the portion of any but angels, till I ſaw this gentleman." This teſtimony ſerves to remove the air of hyperbole from the well-known line of his friend Mr. Pope:—

"To Berkeley every virtue under heaven."

In matters of ſpeculation, his natural ardour might, poſſibly, have led him to imbibe ſome notions that are more fanciful than juſt. It has been ſaid, that towards the cloſe of his life, he began to doubt the ſolidity of metaphyſical ſpeculations, and that he therefore turned his thoughts to the more beneficial ſtudies of politics and medicine. He has been charged by ſome conſiderable perſons, and particularly by biſhop Hoadly, with corrupting the native ſimplicity of religion, by blending with it the ſubtilty and obſcurity of metaphyſics; and Mr. Hume aſſerts, that his writings form the beſt leſſons of ſcepticiſm which are to be found either among the ancient or modern philoſophers, Bayle not excepted; that "all his arguments," againſt Sceptics, as well as againſt Atheiſts and Free-thinkers, ſays Hume, "though otherwiſe intended, are, in reality, merely ſceptical, appear from this, *that they admit of no anſwer, and produce no conviction*." That his knowledge extended to the minuteſt objects, and included the arts and buſineſs of common life, is teſtified by Dr. Blackwell, in his "Court of Auguſtus." The induſtry of his reſearch, and the acuteneſs of his obſervations, comprehend not only the mechanic arts, but the various departments of trade, agriculture, and navigation; and that he poſſeſſed poetical talents in a conſiderable degree, is evident from the animated letters that are found in the collection of Pope's Works, and alſo from ſeveral compoſitions in verſe, particularly the beautiful ſtanzas written on the proſpect of realizing his noble ſcheme relating to Bermuda. The claſſical romance, entitled "The Adventures of Signior Gaudentio di Lucca," has generally but not truly been attributed to him.

Beſides the writings already mentioned, biſhop Berkeley publiſhed at Dublin, in 1735, a ſmall pamphlet relating to the doctrine of Fluxions, entitled "Reaſons for not replying to Mr. Walton's full Anſwer," &c. His ſmaller pieces were collected and printed under his inſpection at Dublin in 1752, under the title of "Miſcellanies." "The works of George Berkeley, D. D. late Biſhop of Cloyne; to which is added an account of his life, and ſeveral letters, &c." were publiſhed in 2 vols. 4to. in 1784. Biog. Brit.

BERKENHOUT, John, ſon of a reſpectable merchant of Leeds in Yorkſhire, but originally from Holland, was born about the year 1730. Being intended by his father for merchandize, after receiving a ſchool education at Leeds, he was ſent to Germany, to acquire a knowledge of that language. Paying a viſit to the baron de Bielfeldt, a relation of his father, reſiding at Berlin, he was, through the influence of that nobleman, firſt made a cadet, and, in progreſſion, an enſign, and afterwards a captain in the Pruſſian army; but on the breaking out of a war between England and France, he obtained his diſmiſſion from the Pruſſian ſervice, and was preferred to the command of a company here. On the return of peace, in 1762, he went to Edinburgh, where he commenced ſtudent in medicine, and after a ſhort reſidence there, he removed to Leyden, and in the year 1765, took his degree

degree of doctor in that faculty. The thesis he wrote on this occasion is intitled, "Dissertatio medica inauguralis de podagra," and is dedicated to his relation the baron de Bielfeldt. On his return to England, he settled at Isleworth, near the Thames; and soon after published his "Pharmacopœia medica," which has been so much approved, as to pass through several editions. But he seems to have been of too active a disposition to remain long in the practice of medicine, in which he never made much progress. In 1778, he was appointed by government one of the commissioners who were sent to America with a view of settling the differences between that country and England, and was the only one of them that was permitted to go to Philadelphia, where the congress was sitting. Here he remained some time, but suspected at length by the congress, and perhaps not without reason, of carrying on a secret correspondence with some of the Americans, who disapproved of their proceedings, he was first sent to prison, but was soon released, and then sent to his brother commissioners at New York. On his return to England, he received a pension from government for the services he had endeavoured to render his country; on which, and his own fortune, he lived as a private gentleman to the time of his death, which happened on the 3d of April 1791.

Dr. Berkenhout was author of various works, besides those mentioned above. In 1772, he published "Outlines of the Natural History of Great Britain and Ireland;" a useful manual for students in that line. In 1788, "First lines of the theory and practice of philosophical chemistry;" which he dedicated to Mr. Eden (lord Auckland), who had been one of the commissioners with him to America. He also wrote "An Essay on the bite of a mad dog; "An Answer to Dr. Cadogan's Essay on the Gout;" "A Preface to the translation of Pomme's treatise on hysteric diseases." He was also the author of "Lucubrations on ways and means," from which the idea of several of our present taxes is said to be taken; and of "A Translation of count Tessin's letters to the late king of Sweden." New Biog. Dict.

BERKER's Creek, *Arian*, in *Geography*, a sand which shoots off from the land towards the sea, to the south of Blenk, or the south sand hill, on the coast of Holland. It is situated on the south of the Land Deep channel into the Texel, the coast trending nearly N. and S. from the Maes to the Texel.

BERKHAMPSTEAD, a market town of Hertfordshire, England, is situated in a fertile country, on the southern bank of the small river Bulberne, at the distance of 26 miles N. W. of London. This town and its vicinity have been the seat of war, and noted by historians as the property and residence of some of the Saxon kings, and other distinguished characters of that nation. After the Norman conquest it was possessed by some princes of the blood, and dukes of Cornwall. On the north side of the town are the embankments, and other remains, of a considerable castle, which Camden supposed was built by Robert Moreton earl of Cornwall, who was brother to the conqueror, and enjoyed the manor, &c. from him. At this place the conqueror had an interview with the English nobility, after his successful battle against Harold. The castle raised by earl Moreton, was demolished in his son's time, who was accused of rebellion, and the town and manor forfeited to the crown. Henry II. granted the inhabitants many privileges, among which was the liberty of selling their goods free of tolls and duties, either in this country or in Normandy, Aquitain, or Anjou. In Domesday-book we find fifty-two burgesses named in this town, whose merchandize was chiefly wool, which was manufactured into cloth on the continent. Henry II. kept his court here, as appears from a grant dated at this place, conferring the church of Havering in Essex on the monks of St. Bernard de Monte Iovis, to provide firing for the poor. King John, in the 7th year of his reign, granted this castle and honour to Geoffrey Fitzpeers earl of Essex; but two years after his death, these places were again in the king's hands. The dauphin of France, in concert with the barons, besieged this fortress, which was bravely defended. The besieged made two successful sallies, and held out until the king sent them orders to surrender. Previously to the second year of Henry III. the markets were held here on a Sunday, but in that year they were changed for Monday, which is still the market day. This castle and lordship continued for a long period in the possession of the earls and dukes of Cornwall, and were repeatedly the scene of rendezvous and baronial contention. The castle was surrounded by a foss and vallum, inclosing about four acres of ground, and the keep, or citadel, was placed on the north side of it: upon the dilapidation of its walls, a large house was constructed with the materials, which was possessed in the rebellion by colonel Axtel.

The town is much reduced from its former consequence, and consists of one long street, having St. Leonard's hospital at one end, and St. James's at the other. The church, dedicated to St. Peter, is a large handsome pile of building, and has several small chapels, or oratories, included within its walls; also some curious old monuments. Here is an alms-house for six poor widows, who are jointly allowed 50l. a year towards their maintenance. The town has also a charity-school and a free grammar school; the latter of which was endowed by king Edward VI. for 144 boys, and provided with a master and usher. Besides these charitable foundations, here is another alms-house, which was endowed by John Layer and his wife, with a legacy of 1300l. Berkhampstead gives the title of marquis to the duke of Cumberland. The chief trade of the place consists in the turning of bowls, of shovels, spoons, and other articles, made of beech wood. Here are three annual fairs, and a statute fair for the hiring of servants, &c. The houses in the parish are 338, and the inhabitants amount to 1690. This town is called Berkhampstead St. Peter's, in contradistinction to another parish a little to the north of it, which was formerly separated from this, and called Northchurch, or Berkhamstead St. Mary's. Salmon's History of Hertfordshire, &c.

BERKI, a town of Asiatic Turkey, in the province of Natolia, near the river Caister; 36 miles E. of Smyrna. N. lat. 38° 23'. E. long. 25° 39'.

BERKLEY, a county of Virginia in North America, lies west of the Blue ridge, north of Frederick county, and separated from the state of Maryland, on the north and east by Potowmack river. This fertile county, about 40 miles long and 20 broad, has 16,781 free inhabitants, and 2932 slaves. Its chief town is Martinsburg.

Berkley, the name of a county and town in Charleston district, south Carolina, lying near Ashley and Cooper rivers. In the census of 1791, it was called St. John's parish, in Berkley county, and contained 752 free persons, and 5170 slaves.

Berkley, a township of Bristol county in Massachusetts, containing 850 inhabitants; 50 miles S. of Boston.

Berkley, or Berkeley, an ancient town of Gloucestershire, England, is distinguished in the annals of this country for its massy baronial castle, and the popular events that have occurred within its walls. The town is scarcely ever noticed in the page of history, whilst the castle is repeatedly mentioned, and referred to from the Norman conquest to the disastrous warfare in the seventeenth century. In some old records this

this place is called Berchelai, and is diſtinguiſhed by the appellation of borough, though it does not appear ever to have ſent members to parliament. Formerly the great public road from Briſtol to Glouceſter, and from the weſtern to the northern counties, paſſed through the town, and conſequently gave it ſome advantages; but this road is now conducted through Newport, and ſome other places, to the eaſt of the town. This circumſtance, with the powerful attractions of Glouceſter and Briſtol, have conſpired to reduce the ſize and conſequence of this place, which at preſent conſiſts of one ſtreet only. The river Avon ſkirts the ſouthern ſide of the town, and is navigable to the Severn for veſſels of 40 or 50 tons. Theſe muſt wait for high tide, which flows round the caſtle gardens, and extends a ſhort diſtance above them. This part of the county is diſtinguiſhed by its fine paſture land, the rich cheeſe made in its dairies, and the golden and London-pippin cyder, obtained from its orchards. The cheeſe moſtly made here is diſtinguiſhed by the double name of Glouceſter, the beſt of which is bought up by the London factors, at high prices. (See CHEESE.) The town is one of the five ancient boroughs of this county, which ſubſiſted in the time of Edward I. and though deprived of moſt of its ancient privileges, yet a mayor is annually elected.

The manor of Berkley is one of the largeſt in England, and was taxed in the Domeſday book at 160 hides, and 294 plough-tillages and a half. It was poſſeſſed, immediately after the Norman conqueſt, by Roger de Berkeley, who came into England with the conqueror, and was rewarded by him with this manor. It has continued in this noble family without interruption to the preſent time, and is now enjoyed by Frederick Auguſtus, the fifth earl of Berkeley, who is the twenty-firſt in deſcent from Harding the Dane.

The caſtle of Berkeley is one of the moſt perfect of the Engliſh baronial edifices, and has ſuffered leſs by the ſcourge of war and injudicious alteration, than any other Engliſh caſtle belonging to a ſubject. Some parts of the original ſtructure are ſtill perfect, and are intereſting examples of the firſt Norman architecture, which was employed in conſtructing the baronial caſtles. The ſite of this building occupies an area of ground whoſe outline is nearly circular. It riſes from a valley on the ſouth and eaſt, and its other ſides are guarded by embattled walls, towers, and fortified gates. The great entrance gate opens into a baſe court, having the keep on the left, and the domeſtic apartments on the right, and in front. The keep, whoſe walls are lofty and maſſive, reſembles the form of a Roman D, and is flanked by three ſemicircular towers, beſides that in which the great ſtone ſtairs are contained. This is ſquare, and has a ſmall dark room near the top, where Edward II. was ſecretly murdered by the machinations of the biſhop of Hereford, who invented and directed the execrable deed.

The elegant and energetic poet, Gray, notices this event in the following expreſſive terms:——

"Mark the year, and mark the night,
When Severn ſhall re-echo with affright,
The ſhrieks of death through Berkeley's roof to ring,
Shrieks of an agonizing king."

The hall, chapel, and moſt of the apartments, are fitted up and preſerved nearly in their ancient ſtyle, and in ſome of them are ſeveral curious relics of antiquity. Among them are many fine old hiſtorical portraits, and the ſopha, chairs, and bedſtead, which belonged to the cabin of the circumnavigator ſir Francis Drake. The hall, which is 43 feet by 33, was built in the reign of Edward III. and has a fine old raftered roof, with a gallery at one end for the accommodation of minſtrels, in "days of yore." Leland mentions ſeveral parks and chaces, as connected with this caſtle at the time he viſited it; but all, except two, have been converted to the more uſeful purpoſe of farming. One of theſe, called Whitley park, which is incloſed with a wall ſeven miles in circumference, ſtill remains, and contains much fine foreſt-timber.

At Purton near this caſtle, the preſent earl of Berkeley has made a decoy pool, which is the only one in this county, and where a great number of wild ducks are annually netted. The celebrated Dr. Jenner, the great promoter of the vaccine inoculation, was born in this pariſh.

To the north of the caſtle is the pariſh church, which is a large handſome ſtructure, and contains ſeveral handſome and ancient monuments of the Berkeley family. The tower is a modern building, and conſtructed at a ſmall diſtance from the church.

In this townſhip are 99 houſes, and 658 inhabitants. In the hundred of Berkeley there appear to be, by the late population act, 3450 inhabited houſes, 9,148 males, 10,074 females, 3968 perſons employed chiefly in agriculture, 6151 employed in trade, manufactures, and handicraft, and the whole number of perſons amounts to 19,222. Rudge's Hiſtory of Glouceſterſhire. Rudder's Hiſtory of ditto.

BERKLEY'S *Point*, lies on the north ſide of lord Egmont's iſland, or New Guernſey, the principal of the groupe called Queen Charlotte's iſlands, in S. lat. 10° 40′. E. long. about 164° 10′.

BERKLEY *Sound*, ſo called from captain Berkley, who viſited it in 1787; an inlet, or bay, on the N. W. coaſt of North America, being the entrance into the ſuppoſed ſtrait of Juan de Fuca, terminated on the ſouth by cape Flattery, and on the north by the ſouthern part of Quadra, or Vancouver's iſland; about 1° 51′ ſouth-eaſt of Nootka ſound. N. lat. 48° 30′. E. long. 235° 35′.

BERKS, a county of Pennſylvania in North America, has Northampton county on the N. E. Northumberland on the N. W. part of Luzern on the N. Dauphin and Lancaſter on the S. W. and Cheſter and Montgomery on the S. E. It is watered by Schuylkill river, and is 53 miles long, and near 29 broad, and contains 1,030,400 acres. Iron and coal, which are plentiful, ſupply ſeveral iron works. The northern parts are rough and hilly. Berks contains 30,179 inhabitants, of whom 65 are ſlaves. It has 29 townſhips, of which Reading is the chief.

BERKSHIRE, a county of the ſtate of Maſſachuſetts, is bounded on the N. by the ſtate of Vermont, on the S. by that of Connecticut; on the E. by Hampſhire county, and on the W. by the ſtate of New York. It runs through the whole extent of the ſtate from N. to S. and contains 26 townſhips; and the number of inhabitants is 30,291. White and coloured marble is found in ſeveral towns, in the rough and hilly parts of this county.

BERKSHIRE, a newly ſettled townſhip of Franklin county in the ſtate of Vermont.

BERKSHIRE, an inland county of England. Previous to, and at the period of the Roman invaſion of Britain, this part of the iſland was inhabited by three Britiſh tribes, reſpectively termed Attebrates, Bibroces, or Rhemi, and Segontiaci. The firſt occupied the weſtern part of the county, from the river Lodden on the ſouth-eaſt, to the Thames on the north-weſt; whilſt the ſecond poſſeſſed the ſouth eaſtern part of the county; and the Segontiaci inhabited the remaining part on the ſouthern ſide. When Conſtantine divided this country into Roman provinces (in 310,) Berkſhire was included in the firſt diviſion, called Britannia Prima. During the Saxon Heptarchy, it conſtituted part of the kingdom of the weſt Saxons, which commenced about A. D. 519, and continued till A. D. 828, when Weſſex became the only ſovereignty,

ſovereignty, and its monarch, Egbert, gave the whole country the name of England. Alfred, grandſon to Egbert, and a native of Wantage in this county, proceeding on the plan of his grandfather, more firmly cemented the kingdoms which Egbert had united, divided the whole into hundreds, tithings, pariſhes, &c. and gave this diviſion the name of Berroethire, which was afterwards contracted and ſoftened into Berkſhire.

This county is bounded by the ſhires of Oxford and Buckingham on the north, having the river Thames running the whole courſe; on the eaſt by Surry; on the ſouth by Hampſhire, and on the weſt by Wiltſhire. In the eſtimation of its ſize authors are at variance, but the moſt accurate ſtatement gives its length from E. to N.W. at 48 miles, and its breadth, in the wideſt part, at 25 miles; though a narrow part near the centre is little more than 6 miles acroſs. It contains about 530 000 acres of land, and is locally divided into twenty hundreds, containing 12 market towns, 140 pariſhes, 62 vicarages, about 670 villages and hamlets, 21,195 houſes, and 109,515 inhabitants. A range of chalk hills entering this county from Oxfordſhire, croſſes it in a weſterly direction, and forms the ſouthern boundary of the vale of White Horſe. Independent of this range of hills, the county is characterized by gentle eminences and valleys; having much rich fertile land, and abounding with picturesque and beautiful ſcenery. Though almoſt every kind of grain is cultivated in the county, yet that of barley is raiſed in greater quantities than either of the other ſpecies, and when made into malt, is chiefly ſent to London. Many large dairy farms are found in the White Horſe vale. Berkſhire is well ſtocked with timber, particularly oak and beech in the weſtern part, and alſo with numerous deciduous and exotic trees in Windſor foreſt and park, and in the various ornamental plantations ſcattered through the county. The open commons and uncultivated fields of Berkſhire are ſuppoſed to conſtitute nearly half the county. Of theſe, Windſor-foreſt, Maidenhead-thicket, Tylehurſt-heath, Wickham-heath, and the numerous commons and marſhes, that are found in almoſt every pariſh, contain above 40,000 acres. The county derives but little advantage from manufactures, there being only a few clothiers eſtabliſhed in the weſtern part of it, and ſome pin-makers, &c. at Reading. On the banks of the river Kennet, in the vicinity of Newbury, are ſome large beds of peat, which furniſhes the poor with fuel, and the farmer with aſhes to meliorate his land.

The principal rivers of Berkſhire are the Thames, the Kennet, the Lamborn, the Ock, and the Lodden. The firſt, though it ſerves to irrigate and fertilize a great part of this county, does not ſtrictly belong to it, being the natural boundary line between this and the counties of Oxford and Buckingham. It enters Berkſhire almoſt one mile ſouth of Lechlade, and in its progreſs eaſtward waters the ſeveral towns of Abingdon, Wallingford, Henley, Maidenhead, Windſor, &c. and having received the tributary waters of various ſtreams, leaves the county near Runnymead.

The Kennet enters the county on its weſtern ſide at Hungerford, and paſſes through a narrow boggy valley to Newbury. Flowing eaſtward, in nearly a direct line, it runs through the county town of Reading, and ſoon afterwards unites with the Thames.

The Lamborn, a tributary ſtream to the former river, riſes near a town of its own name, and after a courſe of about 11 miles, falls into the Kennet at Newbury. This river has been deſcribed as a phenomenon, by many topographical writers, ſome of whom have aſſerted that its current is more powerful and copious in ſummer than in winter. To account for this ſingular occurrence, they have had recourſe to various hypotheſes, but had they viſited the place, and there made inquiries, they would have found, that the river has no remarkable characteriſtic different from others, whoſe courſe is through a ſhort tract of flat country.

The Ock riſes in the vale of White Horſe, near Kingſton-Liſle, and flowing eaſtward, receives ſeveral other ſtreams before it reaches the town of Abingdon, near which it unites with the Thames.

The Lodden enters the ſouthern ſide of the county near Swallowfield, and running directly north, forms the weſtern boundary to Windſor foreſt, and falls into the Thames near Wargrave.

Berkſhire is in the dioceſe of Saliſbury, and included in the Oxford circuit. It ſends nine members to parliament; two of whom are returned for the county, and two for each of the towns of Reading, Wallingford, and New Windſor. The other member is elected for the borough of Abingdon. The Lent aſſizes, and the Epiphany county ſeſſions, are conſtantly held at Reading; the Eaſter ſeſſions at Newbury; the Summer aſſizes at Abingdon; and the Michaelmas ſeſſions alternately at the latter town, and at Reading.

Among the objects of antiquity in this county, is the celebrated White Horſe; which the moſt learned antiquaries refer to Saxon origin; and Mr. Wiſe, who has publiſhed two quarto pamphlets on the ſubject, endeavours to prove that it was deſigned by Alfred, to commemorate a victory obtained by the Saxons over the Danes. It was formed on the ſide of a chalk-hill, by the ſimple proceſs of cutting off all the green turf within a certain line, which reſembled the ſhape of a horſe. This trophy is now nearly obliterated by the graſs growing on its ſurface. Near the White Horſe is a very large encampment, called Uffingdon-caſtle, and about one mile weſtward of the latter is a Druidical monument, named Wayland-Smith. It is a large cromlech on a barrow, with ſeveral ſmaller ſtones, which were formerly placed in a circle round it. Another Druidical relic is to be found at Park-place in this county. This was brought from the iſle of Jerſey, and all its ſtones were placed here in the exact poſition, and relative ſituation in which they were originally found. See HENLEY.

Beſides ſeveral ancient encampments of different ſizes and ſhapes, this county had two Roman ſtations, which are named in Antoninus's Itinerary "Spinis," and "Calleva," and are found in the thirteenth Iter of that work. In the ſeventh Iter is another ſtation, named Pontibus, or Pontis, which antiquaries agree in fixing near the eaſtern border of the county. The Roman Watling-ſtreet paſſed acroſs the northern corner of Berkſhire, entering it near Wallingford, and leaving it on the north-weſtern ſide. Reading is the county town of Berkſhire, and the caſtle of Windſor its greateſt ornament. Camden's Britannia. Coates's Hiſtory of Reading. Horſley's Britannia Romana. Beauties of England and Wales.

BERKUSSA, a town of Croatia, on the river Kulpa, 11 miles weſt of Petrenta.

BERLAI, a town of Croatia, on the river Korana, 8 miles ſouth of Sluin.

BERLAMONT, a town of France, in the department of the North, and chief place of a canton, in the diſtrict of Avesnes, 2½ leagues E.S.E. of le Queſnoy. It contains 1579 inhabitants, and thoſe of the canton amount to 5,794. The territory includes 150 kiliometres, and 14 communes.

BERLASREUT, a town of Germany, in the circle of Bavaria, 12 miles N. of Paſſau.

BERLEBURG, a town of Germany, in the circle of the Upper Rhine, 56 miles E. of Cologn.

BERLEUX, a town of France, in the department of the Somme, and chief place of a canton, in the diſtrict of Péronne, 3 miles S.W. of Péronne.

BERLIN, a city of Germany, in the circle of Upper Saxony.

Saxony, a capital of the electorate of Brandenburg, and of the whole Prussian dominions, is situated on the banks of the river Spree, and has been reckoned one of the most beautiful cities in Europe, as it is one of the largest and most populous in Germany. Its extent is about 4½ miles in length, from the Muhlenthor on the south-east, to the Oranien-burgerthor on the north-west; and about 3 miles broad from the Bernaverthor, on the north-east, to the Potsdamerthor on the south-west: but within this extensive inclosure there are many gardens and corn fields. The streets are disposed with great regularity, and are of a convenient breadth. In the new town they are perfectly straight. Frederick street is reckoned 2½ English miles in length; and others, which intersect this at right angles, are a mile, or a mile and a half long. Some have asserted that it covers as much ground as Paris; but though this be not true, and it be allowed to occupy more than half the extent of the capital of France, its number of inhabitants is much smaller in proportion. The number of houses has been variously estimated. Reisbeck computes them at 6000; count Hertzberg states the number of buildings, public and private, as amounting, in 1790, to 6725; and according to Hoeck, the number of houses is 6950. The number of inhabitants, according to the lowest statement, is 140,000; Hoeck computes them at 142,099: and Hertzberg at 150,803, being, at an average, more than 22 inhabitants to each house. There are a few very magnificent buildings in this town; and the rest are neat houses, built according to a plan prescribed by the late and present king, who have directed their particular attention to the external decorations of the city, either of a fine white free-stone, or of bricks covered with a thin coating of plaster, painted with a light colour, and generally one, or at most two stories high. The situation of the city, in a barren sandy plain, exposes it very much to dust, which, in dry windy weather, is not only inconvenient to the eyes and lungs of the inhabitants, and injurious to their health, but detrimental to the beauty of the buildings, which exhibit a soiled and shabby appearance. The finishing of the houses within by no means corresponds with their external elegance; the rooms are in a ruinous condition, the furniture covered with dust and dirt, and the variety of persons of the meanest condition who inhabit them, altogether incongruous to their outward magnificence and decoration. In these handsome houses, soldiers are quartered even on the ground floor, in rooms looking out to the street; and the lowest mechanics occupy the different stories. The principal edifices are the king's royal palace, and that of the prince-royal. The former is a magnificent structure of free-stone, begun by Frederick I. in 1699; but as it has been constructed at different periods, and by several architects, its fronts are not exactly regular. It consists of four stories, with large apartments, fine cielings, and superb furniture. The state chambers are decorated with capital paintings and rich tapestry, and furnished with tables, stands, lustres, chandeliers, looking-glass frames, screens, couches, &c. of solid silver. The library, though a mean apartment, is well furnished with books; among which is a collection of 500 Bibles in different languages and editions, particularly the Bible used by our Charles I. when he was beheaded, presented as a kind of relic by Dr. Juxon to the elector of Brandenburg, and also the first Bible printed in America, and one of 1450, the first printed in the German language; and also a koran, in a character so small, and on a paper so thin, as to form only 1½ inch in bulk. The arsenal is a noble structure, forming a spacious quadrangle, and containing arms, ranged in excellent order, for 200,000 men. Over the principal gate is a portrait of the elector, William the Great, in a large model of gilt brass; and the four cardinal virtues, of a gigantic size, are placed on pedestals on each side of the portico, and seem to look towards the picture. The soldiers of the garrison amount to about 30,000. The royal stables are very magnificent, adjoining to which are grand apartments for the master of the horse, and his inferior officers; and in the rooms over the stables, may be seen the rich accoutrements of the horse on which Frederick I. rode, when he made his public entry; all the ornaments of the bridles, the breast-leather and crupper, as well as the bits and stirrups, being of gold, adorned with brilliants. The opera-house is a beautiful structure, and on the front bears this inscription, "Fredericus rex, Apollini et Musis." The king allows the free exercise of religion: and, accordingly, in Berlin are 25 churches, 14 of which are Lutheran, 10 Calvinist, and one Roman Catholic, which is the most elegant in the city. The churches are decorated with Mercuries, Apollos, Minervas, and Cupids, "which might lead a stranger to suspect," says Dr. Moore, "that the Christian religion was exploded from the Prussian dominions, and old Jupiter and his family restored to their ancient honours." Instead of saints and crucifixes, says the same writer, Frederick III. proposed to adorn the church of Berlin with the portraits of men who have been useful to the state; those of the marshals Schwerin, Keith, Winterfield, and some others, were actually placed in the great Lutheran church before his death. We may also reckon among the public buildings and establishments of Berlin, the academy of sciences, (See ACADEMY), another of arts and painting, an anatomical college, 5 gymnasia, 2 public libraries, and many excellent and important fabrics and manufactures of silk, woollen stuffs, and stockings, cotton, linen, lace, porcelain, &c. which supply it with a very considerable and advantageous trade, to the prosperity of which, the unlimited toleration granted to Roman Catholics, Lutherans, Calvinists, and Jews, has very much contributed. In Berlin, there are several large squares, in one of which is an equestrian statue of marshal Schwerin, holding the ensign with which he advanced at the famous battle of Prague, and which he seized from one of his officers when his troops were giving way, exclaiming, "Let all, but cowards, follow me." On the new bridge over the Spree, stands also an equestrian statue of William the Great, which is highly esteemed as a piece of fine workmanship: the man and horse in one piece, cast at the same time, and the statue weighs 3,000 quintals. The suburbs are adorned with the magnificent garden of count Reussen, the beautiful house and garden called Mombijon, the house and garden of Belvidere, and the stately hospital of invalids, for the maintenance of about a thousand officers and soldiers. In the new Calvinist church of Old Coln, is the burying place of the royal family. At Berlin there are many public walks and gardens. The principal walk is that in the park, on the south side of the Spree, which is upwards of three miles in circuit, and resorted to by the inhabitants of the city in great crowds on a Sunday; and here they are provided with every kind of refreshment, and indulged with any sort of amusement. The most fashionable walk in the city, is that which lies in the middle of one of the streets. Before the houses at Berlin, on each side, is a cause-way, and between these two cause-ways, are fine gravel walks planted with lime-trees. Under these are pitched tents, in which are sold ice, lemonade, and other refreshments. In the summer, the bands of music belonging to the regiments practise in this walk. In all the private houses a very rigid economy is observed; the chief article of expence is that which pertains to the dress of the ladies, who deny themselves common indulgences, for the sake of powder and millinery. The ladies

adies of the court have much of the air of French women. There are some kinds of irregularities that prevail to a great degree in this city. Public courtezans are more numerous here than in any town of Europe, in proportion to the number of its inhabitants. They appear openly at the windows, beckon to passengers as they walk in the streets, and ply for employment in any way they please, without disturbance from the magistrate. Citizens and manufacturers of the better kind live altogether among those of their own rank; and without affecting the manners of the courtiers, or stooping to the mean debauchery of the commonalty, maintain the decency, plainness, and honesty of the German character. Jealousy is held in equal contempt and detestation by the inhabitants of Berlin, and scandal is very little known. The environs of this city are remarkably pleasant, being interspersed with villages, vineyards, canals, pleasure houses, and gardens. Among the palaces in the neighbourhood belonging to the royal family, Schonhausen and Charlottenburg are the most worthy of notice. The former is situated about two miles from Berlin, on the Panko, which supplies the pond in the sumptuous garden of this palace with water. Charlottenburg also, one of the royal or electoral palaces, seated on the river Spree, was only a small village, till the electress, consort to Frederick I. being pleased with its situation, began to build in it, and after her death the works were carried on by the elector, who gave it its name in commemoration of his wife Sophia Charlotte. This palace is one of the most considerable structures in Germany, and is adorned with a most beautiful garden.

Berlin is divided into five wards, called Berlin proper, Coln on the Spree, Frederick's Werder, Dorotheenstadt, and Fredericksstadt. The proper Berlin was founded in the 12th century, by some colonists invited thither from the Netherlands, and the vicinity of the Rhine, under the margrave Albert, the Bear. The suburbs of this town are frequently called Konigstadt, and by others divided into three viertels, or quarters. Berlin proper is separated by a principal arm of the Spree from Coln, over which are four bridges, three of timber, and one of stone, called the Pontneuf. Coln was probably built about the same time as Berlin; and it is formed into a kind of island by two branches of the Spree, which environ it. New Coln is now a considerable part of the old town of Coln, from which it is separated by the Spree. The suburbs of Coln were inclosed in 1736, within the outer wall. The Frederickswerder was built by the elector Frederick William, on a swampy werder, or island. This ward is separated by a rampart and ditch from the Dorotheenstadt, or Neustadt, founded by the elector Frederick William, and named after his consort, Dorothy. This new town is the most beautiful part of Berlin, and it is chiefly inhabited by the French. In a street of this town is the walk above mentioned. Fredericksstadt, founded by the elector Frederick III. immediately on his accession to the government, communicates with the new town and the Werder, and is the pleasantest ward in the whole city; the streets being spacious, straight, and planted with lime-trees. Behind this is erected a new ward, which ranges to the end of the new town, where many of the nobility have built palaces. In the suburbs, the houses are generally of timber, but so well plastered, that they seem to be of stone, and the streets are broad and straight. From this town there is a free communication, by means of canals, between the Spree and the Oder, and the Spree and the Elbe. Berlin lies in N. lat. 52° 32′ 30″. E. long. 13° 26′ 15″. The annual average of temperature of Berlin for fifteen years, from 1769, to 1782, was, according to Mr. Beguelin's observations, 49°; nor could he find that the temperature decreases. The Baltic, within 120 miles N. of it, tempers the north winds, says Kirwan (see his Estimate of the temperature of different latitudes, p. 71.) and to this is owing the moderate temperature which it enjoys. The influence of the vicinity of the Baltic must be allowed, when it is considered that the temperature of Berlin is higher than that of Dresden, Altenburgh, or Gotha, whose latitude is one degree lower, but more distant from the Baltic. Reisbeck's Travels, vol. iii. Moore's Travels through France, &c. vol. ii.

Berlin, a neat and flourishing town of America, in York county, and state of Pennsylvania, containing about 100 houses. It is regularly laid out, on the S. W. side of Conewago Creek, 13 miles westerly of York town, and 101 west of Philadelphia. N. lat. 39° 56′.—Also, a township in Orange county, Vermont, on Dog river, a branch of Onion river from the south, which last separates Berlin from Montpelier on the N. N. W. Berlin contains 134 inhabitants, and is about 94 miles north-easterly from Bennington.—Also, a township in Hartford county, Connecticut, 12 miles S.S.W. from Hartford, 42 N.W. from New London, and 26 N.N.E. from New Haven.—Also, a township in Worcester county, Massachusetts, containing 512 inhabitants, 34 miles W. from Boston, and 15 N. E. from Worcester. Hops have been cultivated here, and promise to be a valuable article of husbandry. —Also, a township of Somerset county, formerly in that of Bedford, Pennsylvania, which lies on a branch of Stoney creek, a south water of Conemaugh river on the west side of the Alleghany mountain; 25 miles W. from Bedford; 23 N.W. from Fort Cumberland, in Virginia, and 200 W. from Philadelphia. Stone creek, the chief source of Kiskeminitas river, rises N.N.E. of Berlin. N. lat. 39° 54′.

Berlin, a sort of vehicle, of the chariot kind; taking its name from the city of Berlin, in Germany: though some attribute the invention of it to the Italians, and derive the word from *berlina*, the name given by them to a sort of stage, whereon persons are exposed to public shame. In proof of its having derived its origin, as well as its name, from Berlin, it is alleged, that Philip de Chiese, a native of Piedmont, and descended from the Italian family of Chiesa, was a colonel and quarter-master in the service of Frederick William, elector of Brandenburg and that he was much esteemed by the elector on account of his skill in architecture. Being once sent to France on his master's business, he caused to be constructed, for the convenience of this journey, a carriage capable of containing two persons; which in France, and every where else, was much approved and called a berline. This Philip de Chiese died at Berlin in 1673.—Beckman's Hist. of Inventions, vol. i. p. 130.

The berlin is a very convenient machine to travel in, being lighter, and less apt to be overturned, than a chariot. The body of it is hung high, on shafts, by leathern braces; there being a kind of stirrup or footstool, for the convenieney of getting into it; instead of side windows, some have screens to let down in bad weather, and draw up in good weather.

Berlin, in *Natural History*. See Berrin.

BERLINCHEN, in *Geography*. a town of Germany, in the circle of Upper Saxony, and New Mark of Brandenburg, 80 miles E.N.E. from Berlin, and 36 N. N. E. from Kustrin.

BERLINECZ, a town of Poland, in the palatinate of Braclaw, 52 miles W. from Braclaw.

BERLOCH, a town of Bohemia, in the circle of Czazlau, 9 miles N. E. from Czazlau.

BERME, in *Fortification*, a small space of ground, four or five feet wide, left without the rampart, between its foot and

and the ſide of the moat, to receive the earth that rolls down from the rampart, and prevent its falling into, and filling up, the moat.

This is alſo called *liſiere, relais, retraite, pas de ſoures, foreland, &c.*

Sometimes for greater ſecurity, the berme is paliſadoed.

BERMEJO, in *Geography*, the name of an iſland and port on the S.W. coaſt of South America, in about 2 degrees N. lat. a little W. from Lima. It is four leagues diſtant from Mengon on the north, and 6 from Guarmey port on the ſouth. The iſland is a ſmall white iſland, in the middle of which is a bay: the land from hence to Mengon is high, and abounds with hillocks, having large ſpots of white ſand. It has a good harbour and fine freſh water at a ſmall diſtance from the ſhore; and the harbour is known at ſea by a large high hill with a cleft in it, which runs down ſouthward to the ſea-ſide; on the north it is very ſteep.

BERMEO, or VERMEO, a ſea-port town of Spain, in the province of Biſcay, near cape Machicaca, 5 leagues N.W. of Bilbao.

BERMUDA HUNDRED, or CITY POINT, is a port of entry and poſt town of America, in Cheſterfield county, Virginia, ſeated on the point of the peninſula formed by the confluence of the Appamattox with James river, 36 miles weſterly from Williamſburg, 64 from Point Comfort, in Cheſapeak bay, and 315 S.W. by S. from Philadelphia. City Point, from which it is named, lies on the ſouthern bank of James river, 4 miles S.S.W. from this town. The town has about 40 houſes, including ſome warehouſes. It trades chiefly with the Weſt Indies, and the different ſtates. City Point, in James river, lies in N. lat. 37° 16′. W. long. 77° 31′ 30″.

BERMUDAS, or SOMERS' ISLANDS, vulgarly called *Summer Iſlands*, a cluſter of ſmall and rocky iſlands, forming the figure of a ſhepherd's crook, and amounting in number to about 400; ſituated in the Atlantic, and diſtant from the coaſt of Carolina about 200 leagues. N. lat. 32° 35′. W. long. 63° 28′.

They derived their firſt name from John Bermudas, a Spaniard, who diſcovered them in 1527; and their ſecond appellation they owe to ſir George Somers, who was ſhipwrecked on theſe rocks in his paſſage to Virginia in 1609, and lived there nine months. But he and his companions, having built a ſhip of cedar wood, ſailed from thence to Virginia. Sir George Somers, it is ſaid, was driven a ſecond time on theſe iſlands, and died there. But his companions returning to England, made ſo favourable a report of their beauty and fertility, that the Virginia company, who, as the firſt diſcoverers, claimed the property, ſold them to about 120 perſons, to whom king James I. granted a charter. Accordingly, in 1612, they planted the largeſt of them, viz. St. George's iſle, with 160 perſons, and in 1619, ſent thither 500 perſons more; upon which they inſtituted an aſſembly, with a governor and council. It is ſaid, that they are much incommoded by want of freſh water, and by the ſtorms, thunder, &c. to which they are ſubject. Shakeſpeare has therefore juſtly deſcribed them as ever "vexed" with ſtorms; but the poet Waller, who reſided there for ſome time, on being condemned for a plot againſt the parliament in 1643, repreſents them as enjoying a perpetual ſpring. In 1725, the benevolent biſhop Berkeley propoſed to erect a college in theſe iſlands for the converſion of the ſavage Americans. See BERKELEY.

This group of iſlands is ſaid to conſiſt of about 400: but the greater number ſeem to be mere iſlets and rocks, not of ſufficient importance to have received a name. From the chart by Lemprierein 1797, it ſhould ſeem that the largeſt iſland, called "Bermuda," reſembles a hook, the great ſound fronting the north. The length is about 35 geographical miles, and the breadth between one and two. The other iſlands which have received names are St. George's, St. David's, and Sommerſet. The iſland of St. George's lies eaſtward of the main land, and has a capital town of the ſame name, containing about 500 houſes. Contiguous to this is St. David's, which ſupplies the town with proviſions. The air is healthy, and a continual ſpring prevails; ſo that moſt of the productions of the Weſt Indies might probably be cultivated in theſe iſlands. The houſes are built of a ſoft ſtone, which is ſawn like timber, and ſeemingly reſembling that of Bath; and the ſtone is much uſed in the Weſt Indies for filtrating water.

With regard to the ſuppoſed fertility and productiveneſs of theſe iſlands, it appears, from the anſwers of governor Brown to the inquiries of the privy council of England, that they contain from 12 to 13 thouſand acres of very poor land, of which 9 parts in 10 are either uncultivated, or reſerved in woods for a ſupply of timber towards building ſmall ſhips, ſloops, and ſhallops for ſale, this being the principal occupation of the inhabitants; and the veſſels which they furniſh, being built of cedar, are light, buoyant, and unexpenſive. Of the land in cultivation, no part was appropriated to any other purpoſe than that of raiſing Indian corn, and eſculent roots and vegetables, of which a conſiderable ſupply is ſent to the Weſt Indies, until the year 1785, when the growth of cotton was attempted, but without much ſucceſs; there not being at preſent more than 200 acres applied to this ſpecies of culture. The number of white people of all ages in Bermudas is 5462, and of black, 4919. The Bermudians are generally ſeafaring men, and the negroes are expert mariners. In the war between Great Britan and America, there were at one time between 15 and 20 privateers fitted out from hence, which were manned by negroe ſlaves, who behaved irreproachably; and ſuch is the ſtate of ſlavery in theſe iſlands, and ſo much are the negroes attached to their maſters, that ſuch as were captured always returned when it was in their power. Some part of the trade of the Bermudians conſiſts in carrying the ſalt which they fetch from Turks iſland to America, where they ſell it for proviſions or for caſh. Theſe iſlands are frequented by whale-fiſhers. The government is conducted by a governor named by the Britiſh crown, a council, and a general aſſembly: the religion is that of the church of England. There are 9 churches under the care of 3 clergymen; and one Preſbyterian church. The women of theſe iſlands are ſaid to be handſome, and both ſexes are fond of dreſs. Edwards's Hiſt. of Weſt. Ind. vol. i. p. 470.

BERMUDAS *Cedar*, in *Botany*. See JUNIPERUS.

BERMUDIANA. See SISYRINCHIUM.

BERN, in *Geography*, was, before the French revolution, one of the thirteen cantons of Swiſſerland, bounded on the eaſt by the cantons of Uri, Underwalden, Lucern, and the county of Baden; on the north by the Auſtrian foreſt-towns and the cantons of Baſle and Soleure; on the weſt by the canton of Soleure, the county of Bienne, and a part of France; and on the ſouth by the lake of Geneva, the Valais, and the duchy of Savoy. In the year 1352, Berne acceded to the Helvetic confederacy; and poſſeſſed ſuch power, even at that early period, as to obtain the ſecond rank among the Swiſs cantons. Since the acquiſition of the Pays de Vaud, the domains of this canton formed nearly the third part of Swiſſerland, and about the fourth of the actual population. It contained 3840 ſquare miles; its population was eſtimated at 374,000 perſons, and its contingents amounted to 2000. At the introduction of the reformation in 1528, government acquired a large increaſe of revenue by ſecularizing the eccleſiaſtical

ecclesiastical possessions. At the same period the whole canton followed the example of the capital; and the reformed religion was permanently established. This canton was divided into two great portions; the Pays de Vaud, and the German district. The Pays de Vaud having been conquered from the house of Savoy, and the German district from the States of the Empire, justice was administered, and taxes regulated in each by peculiar laws and customs. Each of these divisions had its treasurer and chamber of appeal resident in the capital; the chamber of appeal belonging to the Pays de Vaud judged in the last resort; but the inhabitants of the German district were allowed to appeal to the sovereign council.

The sovereign power of this canton resided in the great council of two hundred, which, when complete, consisted of 299 members chosen from the citizens, from whom they were considered as deriving their power, and as acting by deputation. The authority with which they were invested, was in some respects the most uncontrouled of any among the aristocratical states of Switzerland. The great council of Bern, since the year 1682, when it was declared the sovereign, was restrained by no constitutional check, like some of the others. As a general assembly of the citizens was never convened on any occasion, the executive powers of government were delegated by this sovereign council to the senate, chosen by themselves from their own body; the former ordinarily assembled three times a week, and extraordinarily upon particular occasions; the senate, every day, Sundays and festivals excepted. The senate, comprising the two avoyers, or chiefs of the republic, was composed of 27 members; and from this select body were taken the principal magistrates. On a vacancy in the senate, 26 balls, 3 of which were golden, were put into a box, and drawn by several members; and those who drew the three golden balls, nominated three electors out of their body. In the same manner, seven members were chosen from the great council, who also nominated seven electors out of their own body. These ten electors fixed on a certain number of candidates, not exceeding ten, nor less than six; and such among these candidates as had the fewest votes in the sovereign council, retired till their number was reduced to four; then four balls, two golden and two silver, were drawn by the four remaining candidates; the two who drew the former were put in nomination, and he who had the greatest number of suffrages in the sovereign council was chosen. But the candidate, in order to be eligible, must have been a member of the great council ten years, and must be either a married man or a widower. The greatest excellence of this mode of election consisted, as Mr. Planta observes, in making the chance of lots apply chiefly to the electors, and not to those who might pretend to the succession, by which the dangerous effects of cabal were in a great measure obviated, and yet a fair prospect of success was given to the meritorious, while those wholly unqualified could entertain little hopes of being preferred. The selected candidates drew lots only in one stage of the proceeding; and this when their number being reduced to only four, an even chance was given to those few to whom eminent qualifications had secured the marked approbation of their fellow-citizens; and when fortune proved unfavourable in one instance, repeated opportunities would occur, in which, unless she proved singularly unpropitious, the desired object would be ultimately obtained.

The great council was generally filled up every ten years; as within that period there was usually a deficiency of 80 members to complete the whole number of 299. When this deficiency occurred, and not before, anew election was proposed; nor could it be deferred when there was a deficiency of 100. The time of election being determined by vote, each avoyer nominated two of the new members; each seizenier, and each member of the senate, one; and two or three other officers of state enjoyed the same privilege. Some few persons claimed, by virtue of their office, a right of being elected, which was generally allowed. These several nominations and pretensions generally amounted, on the whole, to about 50; the remaining vacancies were supplied by the suffrages of the senate, and the seizeniers. These seizeniers were sixteen members of the great council, drawn yearly from the abbayes or tribes; and the candidates were generally taken from those who had exercised the office of bailiffs, and were elected by lot. They were invested with an authority similar to that of the Roman censors; and in case of mal-administration, might remove any member from the great council or senate, though they have seldom exercised this power. The principal magistrates were two avoyers, two treasurers, and four bannerets; each chosen by a majority of voices in the sovereign council, and yearly confirmed in their respective offices. The avoyers held their posts for life; the treasurers, six years; and the bannerets, four. The two treasurers, one for the Pays de Vaud, and the other for the German district, formed, in conjunction with the four bannerets, an economical chamber or council of finance, which passed the accounts of the bailiffs, and received the revenues from those who were accountable to the government. The four bannerets, the ex-avoyer, who was the first senator in rank, and president of the secret council, the senior treasurer, and two members of the senate, composed a committee or secret council, in which all state affairs, requiring secrecy, were discussed.

Although the form of this constitution was aristocratical, and the senate possessed a very considerable influence, yet it did not enjoy (says Mr. Coxe) that almost exclusive authority which exists in many aristocratical governments. For, by several wise and well observed regulations, the sovereign council, although it delegated the most important concerns of government to the senate, yet assembled at stated times, and superintended the administration of public affairs. Mr. Burke asserts, that the republic of Berne was one of the happiest, most prosperous, and best governed countries on earth.

The canton of Bern, by its old constitution, was divided into a certain number of districts, called bailliages (see BAILLIAGE), over which bailiffs were chosen from the sovereign council. These were the most profitable posts in the disposal of government, and very eagerly pursued. They were formerly nominated by the bannerets, but the mode of election was altered in 1712, and they were chosen by lot. The bailiffs were representatives of the sovereign power in their respective districts; whose business it was to enforce the edicts of government, to collect the public revenues, to act as justices of the peace, and to be judges in civil and criminal causes, except where there was any local jurisdiction. In civil cases, beyond a certain value, an appeal lay to the courts of Bern: in criminal affairs, the process underwent a revision in the senate, and was referred to the criminal chamber, which inflicted punishments for small misdemeanours; but in capital cases, the sentence was to be confirmed by the senate, and by the sovereign council, if the delinquent was a citizen of Bern. The bailiff delivered his accounts to the economical chamber, to which court an appeal lay in case of exaction on his part, or on the part of his officers. The profits of the bailiff's office arose from the produce of the demesnes, of the tithes, certain duties paid to government in the respective bailliages, and from the fines imposed

 for

for criminal offences. In ſome parts of the German diviſion, the bailiff became entitled, upon the death of every peaſant, to a determinate part of the inheritance, which proved in ſome ſituations an oppreſſive tax upon the family. The bailiff, being governor and judge in his own diſtrict, and having a magnificent chateau for his accommodation, not only poſſeſſed great power, but in the courſe of his adminiſtration, which laſted ſix years, was able to live with proper magnificence, and, to lay up two or three thouſand pounds without extortion or unbecoming parſimony.

In Bern, the militia was ſo well regulated, that government was able to aſſemble a very conſiderable body of men at a moment's warning. To this purpoſe every male at the age of 16 was enrolled, and about a third of the whole number was formed into particular regiments, compoſed of fuſileers and electionaries; the former being bachelors, and the latter married men. Every perſon thus enrolled was obliged to provide, at his own expence, an uniform, a muſquet, and a certain quantity of powder and ball; and no peaſant was allowed to marry, unleſs he produced his uniform and arms. Every year a certain number of officers, called land-majors, were deputed by the council of war, to inſpect the arms, to complete the regiments, and to exerciſe the militia. The regiments were, beſides this annual review, occaſionally exerciſed by veteran ſoldiers appointed for that purpoſe. Beſide the arms in the arſenal of Bern, a certain quantity is alſo provided in the arſenal of each bailliage, ſufficient for the militia of that diſtrict, and likewiſe a ſum of money amounting to three months' pay, which is appropriated to the electionaries in caſe of actual ſervice. The dragoons were choſen from the ſubſtantial farmers, each of whom provided his horſe and accoutrements. In time of peace the avoyer out of office was preſident of the council of war; but during war, a general in chief was nominated for the forces of the republic. A certain number of regiments being thus always ready, ſignals are fixed on the higheſt part of each bailliage, for aſſembling the militia at a particular place in each diſtrict, where they receive orders for marching. As the page of hiſtory does not exhibit a greater curioſity than what was called the "exterior ſtate" at Bern, we ſhall here ſubjoin a brief account of it. It was a model of the ſovereign council, and compoſed of thoſe burghers who had not attained the age requiſite for entering into that council. It had a great council, a ſenate, two avoyers, treaſurers, bannerets, and ſeizeniers; all of whom were choſen in the uſual manner, and with the accuſtomed ceremonies. The poſt of avoyer in this mimic legiſlative community was ſolicited with great aſſiduity, and ſometimes obtained at a conſiderable expence, as the ſucceſsful candidate was always admitted into the great council without any farther recommendation. This body poſſeſſed 66 bailliages, conſiſting of ſeveral ruined caſtles diſperſed throughout the country, among which Hapſburg was the principal. It had alſo its common treaſure, and its debts; differing in this latter reſpect from the actual government of Bern, which was not only free from debts, but poſſeſſed of a very conſiderable fund in reſerve. Great honours were paid to this ſingular inſtitution, as it was in fact a kind of political ſeminary for the youth of the canton, who were likely to arrive in ſome future period at the higheſt offices in the ſtate. Its badge, or coat of arms, which was an ape ſitting on a lobſter, and viewing itſelf in a mirror, was no bad emblem of its mock conſequence.

The revenues of Bern, out of which were paid the ſalaries of the principal magiſtrates, which were extremely moderate, the reigning avoyer being allowed 400l., each of the ſenators 150l., and the banneret 230l., and which were applied to the expences of the government, were derived principally from the public demeſnes appropriated at the time of the reformation; the tithes, ſequeſtered at the ſame period, and aſſigned to the maintenance of the clergy, public ſeminaries, and charitable inſtitutions; quit-rents, and monopoly of ſalt and gun-powder; produce of the poſt-office; cuſtoms and tolls; duty on wine imported into the capital; and fines impoſed for miſdemeanors; alſo a tax on the alienation of landed property in the French diſtrict; the intereſt of money accumulated from a regular progreſſion of ſavings, of which nearly 500,000l. were lodged in the Engliſh funds. The whole revenue has been ſtated by the beſt authorities as not exceeding 300,000 crowns, which were always more than ſufficient to ſupply the expenditure, and to conſtruct and ſupport the magnificent public works. A large treaſure was always reſerved in a vault of the capital for ſudden emergencies, and the care of this vault entruſted to the principal magiſtrates, each of whom had a ſeparate key, and without their concurrence, and a ſpecial order from the ſovereign council, the door could not be opened. The amount of this treaſure could not be accurately aſcertained, but it muſt have been very conſiderable, as not leſs than 160,000l. ſterling was depoſited in the mountains of Haſli and Oberland. The pillage of this treaſure was one of the principal objects of the French directory, to defray the expences of their armament againſt Egypt. In the plunder of Bern, it is ſaid that the French did not acquire leſs than 400,000l. in ſpecie.

When the directory of France determined to revolutionize Swiſſerland, it directed its whole force againſt the canton of Bern, on the conqueſt or ſubmiſſion of which the reduction of the country at large depended. Its hoſtilities were preceded, in 1797, by requiring Bern, and the other Helvetic cantons, to diſmiſs the Britiſh miniſter, who withdrew, and voluntarily announced the termination of his embaſſy in a dignified note addreſſed to the rulers of Bern. France, having accompliſhed the firſt part of its plan, which was that of dividing the confederate ſtates, proceeded to the attainment of their ſecond object, which was the ſubjection of Bern. With this view they ſecured the paſſes which facilitated the invaſion of the Berneſe territory, by ſeizing the Erguel and the town of Bienne. The ſubſequent attempt to detach the Pays de Vaud from Berne, and to erect it into a republic, under the auſpices of France, was equally ſucceſsful, from the puſillanimity and infatuation of the Berneſe government. Bern, after ſome feeble and ineffectual remonſtrances, relinquiſhed its claims on the Pays de Vaud, and made overtures of conciliation to the French directory, and to Mengaud, their agent, in Swiſſerland. But theſe degrading meaſures ſerved only to haſten the fall of the republic. At length, after ſome fruitleſs negociations, they had recourſe to arms; and the forces of Soleure and Friburgh ranged themſelves under the ſtandard of Bern; and the chief command was entruſted to general d'Erlach, a member of the ſovereign council, who was a veteran diſtinguiſhed for military ſkill and undaunted courage. The combined forces of Bern, Soleure, and Friburgh, amounted at this time to 25,000 men, and extended from the northern frontiers of the canton of Soleure beyond Friburgh; occupied the ſtrong poſition of Vailly, between the lakes of Morat and Neufchatel, and puſhed their advanced corps as far as the vallies of Ormond, towards the ſouth-eaſtern extremity of the lake of Geneva. By this poſition they covered the towns of Soleure, Bern, and Friburgh, and prevented all communication between the two French armies, in the Pays de Vaud, and the biſhopric of Baſle. Erlach, having arranged his plan of offenſive operations in a maſterly manner, was confident of ſucceſs, and his troops were eager for the combat. In this

this ſtate of preparation, and whilſt he was employed in diſtributing his inſtructions previouſly to an engagement, he received orders from Bern, which revoked the powers with which he had been intruſted, and commanded him to ſuſpend hoſtilities, as a negotiation was opened with the commander in chief of the French forces, general Brune. He immediately repaired to Bern, and there found the fatal aſcendancy of the French party. Diſſatisfied with Brune's ultimatum, the magiſtrates iſſued their orders to general Erlach to renew his plan of attack. But ſtill timid and wavering, they renewed their negotiations, which ſeemed merely to ſubject them to freſh inſult. In the mean while a ſpirit of diſaffection was ſpread among the troops, which Erlach, by his ſeaſonable interpoſition, ſuppreſſed; and they again prepared for attacking the enemy. But no ſooner was the order iſſued to this purpoſe, than it was again revoked, and a new conference was opened with the French general. Theſe contradictory orders roufed the indignation of the troops, ardent for an engagement; and they withdrew all confidence from their officers, whom they regarded as accomplices in the deſtruction of their country; and many of them indignantly quitted their ſtandards. The army of Bern, thus diſpirited by counter-orders, pretended negotiations, and the gradual advances of the enemy from one advantageous poſt to another, and reduced to the number of 14,000 men, determined, however, under the command of their valiant leader Erlach, to make a final effort for expiring liberty, and to encounter 40,000 veterans, flushed with conqueſt, and in a high ſtate of diſcipline. After four deſperate engagements, Erlach reſiſted a fifth aſſault under the walls of Bern, nor did he finally abandon the conteſt, till his little army, diminiſhed to 7000 men, had loſt 2000 of their number, and the troops of the two French generals, Brune and Schawembourg, were on the point of uniting, while the capital was unprepared for a ſiege. Bern ſurrendered to the firſt ſummons of general Brune, and a tree of liberty was planted in his preſence. Erlach, having wonderfully eſcaped from the repeated aſſaults of the enemy, was haſtening towards the mountains of Oberland, with hopes of collecting his ſcattered forces for another effort; but being recognized upon the high road between Bern and Thun by ſome ſtraggling ſoldiers, he was ſeized, bound, and placed in a cart, in order to be conveyed to the capital; but another deſperate band aſſaulted him, and, amidſt reproaches and execrations, maſſacred him with their bayonets and hatchets. The ſubjugation of Bern ſpeedily decided the fate of Swiſſerland. Upon the diſſolution of the Helvetic confederacy, in 1798, Geneva, Mulhauſen, Bienne, and the biſhopric of Baſle, were annexed to France; the remainder of the country, except the Griſons, was modelled into a republic, one and indiviſible, divided into 18 departments, and governed by a ſenate, a great council, and five directors, who firſt aſſembled at Arau, and were afterwards tranſferred to Lucern. By the conſtitution now eſtabliſhed, Bern, including the central and weſtern part of the ancient canton, with the diſtrict of Schwartzenburgh, was made one of the 18 departments, and Bern was its capital. According to this diſtribution, the canton of Bern is bounded on the north by that of Soleure, on the eaſt by that of Lucern, on the ſouth by that of Oberland, and on the weſt by that of Sarine and Broie. During the campaign of 1799, part of Swiſſerland experienced a momentary deliverance; but from the unfortunate miſunderſtanding between the courts of Peterſburg and Vienna, the directorial government was re-eſtabliſhed. This was ſucceeded by a proviſional government, which was firſt ſeated at Lucern, and on the progreſs of the Auſtrians in 1799, removed to Bern. When peace was eſtabliſhed with the emperor by the treaty of Luneville, the French ambaſſador tranſmitted the plan of a new conſtitution; according to which, Swiſſerland, including the Griſons, was divided into 17 cantons. Accordingly, by this conſtitution of 1801, Bern, in its former extent, except the Pays de Vaud and Argovie, was the firſt of the 17 departments, or cantons, and the number of its repreſentatives deputed to the diet was nine. The whole body conſiſted of 77 members, choſen by the repreſentatives of each diſtrict, and aſſembled at Bern, to organiſe the new conſtitution. The legiſlative authority was veſted in the ſenate, compoſed of two landammans and twenty-three counſellors. The executive power was lodged in a little council of four ſenators, in which each of the landammans preſided in turn. The landamman in office was to receive a ſalary of 50,000 French livres, and the other landamman and four counſellors 10,000 each. The ſalaries of the ſenators were not to exceed 6000 livres. Each canton was governed by a prefect, nominated by the landamman, and was provided with its interior adminiſtration, which approved or rejected the projects of laws preſented by the ſenate. By the conditions of eligibility, univerſal ſuffrage was aboliſhed; and no perſon admitted to any public office, unleſs he was proprietor of land, or exerciſed an independent profeſſion, and paid a contribution to the public burdens, the amount of which was regulated by each canton. A counter-revolution afterwards took place, by which the diet was diſſolved, and the proviſional government eſtabliſhed as it exiſted before the 29th of May 1801. But the fate of Swiſſerland is not yet decided. For a further account of the alterations that have taken place from this period in the conſtitution and government of the Swiſs cantons, ſee HELVETIA. Coxe's Travels, vol. i. & ii. Plauta's Hiſt. of the Helvetic Confederacy, vol. ii.

The canton of Bern is fertile and well cultivated; the plains produce corn and fruit; and the Alpine eminences afford excellent paſture, which ſupports herds of cattle and flocks of ſheep, from whoſe milk they make butter and cheeſe. The inhabitants of the diſtrict of Sanenland in this canton, are principally herdſmen and ſhepherds, who hold a middle rank between that of cultivators and wandering Tartars or Arabians. Each family changes its habitation five or ſix times in a year; and every week it is cuſtomary to meet the father of his houſhold, with his wife and children, and preceding them, herds, a cheeſe, kettle, and ſome wooden utenſils, travelling, like an ancient patriarch, in ſearch of a new reſidence. The country abounds with cots and houſes, moſt of which are conſtructed of wood, and in ſuch a manner as to be eaſily taken to pieces and removed for the convenience of their migration. In ſome of the vallies, the meadows are ſometimes twice mowed, and thus fed. The mountain herbage for the cattle continues ten or twenty weeks, according to its height and ſituation. When their winter forage is finiſhed, they remove to the loweſt parts of the mountains, and having conſumed their whole flock, proceed with their flocks towards the ſummits. Their progreſs is regular and majeſtic. The moſt beautiful cow of the herd, adorned with a magnificent collar and bell, takes the lead, accompanied by the maſter of the family. Then follow his attendants, with the reſt of the flocks. Shepherds and cattle are all bedecked with garlands of flowers; and every part reſounds with the jingling of bells, lowing of cows, and cheerful notes of the herdſmen. The ſmaller flocks bring up the rear, and the proceſſion is cloſed with the wife and children. Towards the end of Auguſt they again deſcend toward the lower parts, paſture the laſt graſs in the vallies, and at laſt retire to their warm retreats in the vale, to wait the return of ſpring and the ſame pleaſing migration. In this part of the country no attention is paid to the culture of the meadow land; for though they contrive

contrive to water their meadows without any fixed rules, and dung them in winter, they never drain thofe that are marfhy, and water is left to ftagnate on the fides of flopes and declivities. In the cold vallies, where in April the fnow remains at the depth of fome feet, they frequently ftrew mould on its furface, which foon melts it, and thus various gardens are cultivated in the midft of large tracts of fnow. Potatoes have been lately planted, and are become a favourite food of the people, and in many cafes have been fubftituted for bread inftead of corn. The Alpine bean, ground into flour, ferves the fame purpofe; whilft its leaves fupply fodder for the fheep, and its ftalk litter for the pens. Since the introduction of the commerce of cheefe, the cultivation of corn has been annually decreafing. Some few fpots of ground are, however, fown with wheat and barley, and others with hemp and flax, which are very thriving. The operations of the dairy render them negligent in the culture of fruit-trees; nevertheleefs, plum, cherry, pear, and apple-trees, are fcattered here and there, but are nowhere collected into an orchard. In the German parts of Sanenland, they boil cherries with cloves and cinnamons into a kind of pafte, which is preferved good for thirty years. Mixed with a few grains of muftard-feed, and other fpices, they ufe it as a fweet muftard; and beaten together with fpices and juniper berries, they allow it to ferment, and drink it as a red beer. For want of fome regulation about their woods, whole forefts are cut for palings to inclofe their meadows, which foon become rotten, and ufelefs even for fuel. Madder grows in this diftrict wild and high. The moft beautiful and moft fertile fpots of the canton of Bern are on the fides of the lakes of Geneva and Neufchatel, where grow the moft excellent fruits, and where are made the moft valuable wines. In this canton are found a variety of coloured earths and clays, fome of which are ufed for pottery, and ftones of different forts, plafter of Paris, cryftal, falt fprings, coal, fulphur, mines of iron, copper, lead, and filver, and medicinal baths. They count in this canton 39 towns, great and fmall, and 1300 villages. The rivers that water it, are the Aar, the Emmat, the Wigger, the Reufz, the Limmat, the Sanen, and the Kandel. The principal lake is that of Geneva; befides which there are thofe of Neufchatel, Biel, Murat, or Murten, Thun, Brientz, and Halwyl, all which abound in fifh. The part of the chain of the Alps feen from Bern, is diftinguifhed by the different names of Wetterhorn, Schreckhorn, Finfter Aar-horn, Viefcherhorn, Exterior and Interior Eger, Eungfrace horn, Gletcher horn, Ebenefluh, Mittaghorn, Briethom, Lauterbrunen, Blumlis Alp, and Neifs; and it forms an amphitheatre, gradually rifing from the environs of the city to elevated peaks, covered with eternal fnow, and hitherto inacceffible. The Jungfrau, or Virgin, is one of the higheft and moft beautiful mountains in the canton of Bern.

The following table exihibits the height of the principal Alps in this canton.

	Eng. Feet.
Finfterarhorn,	14,116
Jangfrauhorn,	13,730
Mouch,	13,510
Schreckhorn,	13,397
Eiger,	13,086
Wetterhorn,	12,217
All Els,	12,194
Frau,	12,153
Doldenhorn,	12,039
Niefen,	7,829
Morgenberghorn,	7,456
Hohgant,	7,290
Stockhorn,	7,218

The prevailing language is the German; but the people of fafhion fpeak either French or Italian; and the common people in the Pays de Vaud, and in thofe parts that border on France and Italy, ufe a corrupt French or Italian, or a jargon, founded on both. The eftablifhed religion is Calvinifm; and the miniffers are divided into deaneries and claffes, and hold yearly chapters or fynods. They are more independent of the civil power than in the other cantons, and are forbidden to interfere in matters of ftate. The nobility of Bern are accufed of an extraordinary degree of pride and ftatelinefs, and affect to keep the citizens and perfons of lower rank at a great diftance. As the whole power of government, and all the honourable offices of ftate, are in their hands, they are not permitted to engage in trade; and without the places and penfions which they enjoy, they muft be poor and wretched. The lucrative offices being thus in the hands of the nobility, it might be imagined that people of the middle and lower ranks are indigent and oppreffed. This, however, is by no means the cafe; for the citizens, i. e. the merchants and trades people, feem in general to enjoy all the comforts and conveniences of life; and the peafantry is uncommonly wealthy throughout the whole canton of Bern. They poffefs the privilege of bearing arms, and form a very refpectable body of military, that have been ufually attached to the exifting government, and particularly favoured by it. The manufacturer, in this refpect, lefs docile than the peafant, is lefs regarded; and the government of Bern has been charged with difcouraging, or at leaft not zealoufly promoting, manufactures and commerce. Mr. Coxe informs us, that, in his firft vifit fo Swifferland, he found the people of Bern much lefs informed, and more indifferent about the encouragement of literature, than thofe of the other cantons; their academical ftudies being principally directed to thofe branches of knowledge that fitted them for the church; and the fociety for the encouragement of agriculture, which was almoft the only eftablifhment tending to promote the arts and fciences, obtained little countenance from government. However, in his fecond journey, after an interval of about ten years, viz. in 1786, he fays, that the government, roufed from its former lethargy, had begun to perceive that it is the intereft of every wife ftate to efteem and protect the fciences; and that the magiftrates had lately purchafed and appropriated at Bern a large manfion for the public library, increafed the collection of books, and procured from England an extenfive apparatus for experimental philofophy. A literary fociety had alfo been inftituted for the promotion of phyfics, and natural hiftory in general, and that of Swifferland in particular. In January 1788, this fociety confifted of ten members refident at Bern, of whom feveral poffeffed, and others were forming, collections agreeable to the plan of the inftitution. A regular correfpondence was alfo eftablifhed in various parts of Europe; and the members have been difpofed to fatisfy the inquiries of foreign naturalifts relating to the natural hiftory of this country. The principal articles of exportation from this canton are horfes, cheefe, linen cloth, coarfe cloth and canvas made of hemp, cloth of cotton, and woollen ftuffs. It is faid that 10,000 pieces of linen have been fent annually from this canton; the principal part of which has been conveyed to Lyons. At Bern they have manufactures of filk, chiefly ftuffs, and coloured ftockings. In the weftern part of the mountains, the principal employment is clock-making, and the polifhing of falfe ftones.

Bern, a city of Swifferland, and capital of the canton of that name above defcribed, derives its name, as it has been faid, from a "bear," which was found there when its foundations were laid; "berne" in German fignifying bears; and

and accordingly, it bears this animal in its arms, and always maintains one. It was built by Berchtold the 5th, duke of Zæringen, and was, from its foundation, an imperial city. Upon his death in 1218, the emperor Frederick II. conferred upon the inhabitants considerable privileges, and compiled a code which forms the basis of their present civil law. The liberty which this city enjoyed attracted many persons from the adjacent country, who found a sure asylum from the oppression of the nobles. Although Bern, from its foundation, was engaged in perpetual wars with its neighbours, and for some time with the house of Austria, yet it continued to aggrandise itself by degrees, and considerably enlarged its territory.

This is a regular well-built town, with some air of magnificence. The principal streets are broad and long, not straight, but gently curved; the houses are built of a greyish stone upon arcades, and are mostly uniform, and of the same height. On each side are piazzas, with a wall raised four feet above the level of the street, which are very commodious in wet weather. A stream of the Aar runs in a clear current, and along a stone channel, through the middle of the streets, which furnishes several fountains not less ornamental to the place than beneficial to the inhabitants. The river Aar almost surrounds the town; winding its course over a rocky bed much below the level of the streets, and forming by its steep and craggy banks a kind of natural rampart. The stream that passes through the town serves to keep the streets always clean; for which purpose criminals are also employed in removing rubbish, both from the streets and public walks. The more atrocious delinquents are chained to waggons, while those who are condemned for smaller crimes are employed in sweeping the light rubbish into the rivulet, and throwing the heavier into the carts or waggons, which their more culpable companions are obliged to push or draw along. These wretches have collars of iron round their necks, with a projecting handle in the form of a hook to each, by which, on the slightest offence or mutiny, they may be seized, and are entirely at the command of the guard, whose duty it is to see them perform their work. People of both sexes are condemned to this labour for months, years, or life, according to the nature of their crimes. The public buildings at Bern, as the hospital, the granary, the guard-house, the arsenal, and the churches, are magnificent, and announce the riches and grandeur of the republic. The cathedral is a noble pile of Gothic architecture, standing upon a platform raised from the bed of the river, and commanding a most extensive view. The arsenal contains arms for 60,000 men, and a considerable quantity of cannon, which is cast in the town. The Bernese value themselves on the trophies contained in it, as well as upon the quantity, good condition, and orderly arrangement of the arms. Here is exhibited the statue of William Tell, who, with an arrow, is said to have struck off the apple placed upon his son's head by the governor Grifler, and by that means saved his life, which occasioned the beginning of the Swiss republic. The granary always contains a large provision of corn, supplied in consequence of particular treaties by France and Holland. The charitable institutions in this town are numerous, and well regulated. The hospitals are in general large, clean, and airy; and in the alms-house for the reception of 50 poor citizens, is a curious establishment similar to one at Basle, which provides for the reception of distressed travellers, who are accommodated with a meal and lodging at night, and each receives sixpence on their departure; if sick or wounded, they are maintained till their recovery. The house of correction is conducted partly on the plan of the benevolent Mr. Howard, and in consequence of his suggestion. The delinquents are separated and distributed in two houses; one called the house of correction for greater crimes, and the other the house of labour for misdemeanors. The prisoners are also discriminated by the appellations of "brown" and "blue," from the colour of their clothes: the former being appropriated to the house of correction, and the latter to the house of labour. The men and women occupy separate apartments; and both are constantly employed in cleaning the streets and other servile occupations, and at other times in learning to read and write, and in acquiring the knowledge of various trades, which may enable them to gain a maintenance when their time of confinement expires. By these means the expence of the establishment is nearly supported, and an honest livelihood assured to those who would otherwise prove useless or pernicious members of society. There are four tables, at which the respective seats are made of distinction appropriated to good behaviour, and a larger or lesser share is distributed to each in proportion to their industry. After earning their food, the prisoners in the house of labour receive 10 per cent., those in the house of correction 8 per cent., for their extra-work. The torture at Berne is now formally abolished, by a public act of government; and justice is wisely and impartially administered. The solemnity used in passing capital sentence on a criminal deserves to be mentioned. When the trial is finished, the prisoner is informed of his condemnation by the "grand sautier," or lieutenant of the police, and attended by two clergymen to prepare him for death. On the day appointed for execution, a large scaffold, covered with a black canopy, is constructed in the middle of the principal street. The avoyer, with a sceptre in his hand, is seated on an elevated kind of throne between two senators, and attended by the chancellor and lieutenant of the police, holding an iron stick, called "the rod of blood," all habited in their official robes. The criminal, being brought to the foot of the scaffold, without chains, receives the sentence of condemnation, which is read aloud by the chancellor, at the close of which the avoyer commands the executioner to approach, who instantly binds the arms of the culprit, and leads him away to the place of execution.

The public library is a small, but well-chosen collection, containing 20,000 volumes, to which additions have been made by purchase, and by the liberality of private contributors; to this belong also a few antiques, a cabinet of Swiss coins and medals, some curious manuscripts, particularly of the thirteenth century, consisting of several songs and romances of the Troubadours, written in that and the preceding ages, and some other curiosities. The small figure of the priest pouring wine between the horns of a bull, is merely valuable, because it illustrates a passage of Virgil, and has been mentioned by Addison.

To the account of the public buildings of Bern, we may add that of an elegant edifice, built by the voluntary subscription of the nobility, furnished with accommodations for many public amusements, such as balls, concerts, and theatrical entertainments, which latter are seldom permitted in this city. The walk by the great church was formerly the only public walk, and much admired on account of the view from it, and the peculiarity of its situation; being on one side on a level with the streets, and on the other some hundred feet of perpendicular height above them. Besides this, there is now another walk on a high bank on the side of the Aar, and at some distance from the town. This walk is singularly magnificent, commands a view of the river, the town of

Bern, the country about it, and the glaciers of Switzerland. The adjacent country is richly cultivated, and agreeably diversified with hills, lawns, wood, and water; the river flows rapidly below, and an abrupt chain of rugged and snow-capt Alps bounds the distant horizon.

The population of Bern is estimated at about 13,000; the society is extremely agreeable; and foreigners are received with great ease and politeness. The men do not meet in separate societies; and the women are the life and ornament of their daily assemblies, which begin about four or five in the afternoon, and continue till eight, when the parties usually retire to their respective houses. The inhabitants are particularly fond of dancing, which of course is a frequent amusement; and this diversion commences at the early hour of five in the afternoon, on account of a standing order of government, which prohibits their continuance after eleven. There is but little trade in the capital. Some few manufactures, chiefly of linen and silk, have been established; but they are carried on only by those who have no prospect of being admitted into the sovereign council, and who would think themselves degraded by commerce. But as offices of the state, those of the bailliages excepted, are neither numerous nor very profitable, many enter, as their sole resource, into foreign armies. As for the peasants, who have acquired opulence either by manufactures or commerce, they seldom quit their station, but retain the habits acquired in early life, and, however wealthy, never give their daughters in marriage to any but persons of their own description. Of the burghers of Bern, those only are qualified for the magistracy and government of the city, who are the descendants of such as were made burghers before the year 1635; and, besides, they must not be under 30 years of age, and must be enrolled in one of the twelve companies. The British envoy to the Swiss cantons usually resides at Bern. N. lat. 46° 55′. E. long. 7° 20′. Coxe's Travels, vol. ii. Moore's View of Society, &c. in France, Switzerland, &c.

Bern-*Machine*, in *Agriculture*, the name of an engine for rooting up trees, invented by Peter Sommer, a native of Bern in Switzerland. This machine, of which there is a model in the machine-room of the Society for the encouragement of Arts, is represented in *Plate* III. *Agriculture;* and consists of three parts, the beam, the ram, and the lever. The beam ABC (N° 1.) of which only one side is seen in the figure, is composed of two stout planks of oak, three inches thick at least, and separated by two transverse pieces of the same wood, at A and C, about three inches thick. These planks are bored through with corresponding holes, as represented in the figure, to receive iron pins, upon which the lever acts between the two sides of the beam, and which is shifted higher and higher as the tree is raised, or rather pushed out of its place. The sides are well secured at the top and bottom by strong iron hoops. The iron pins on which the lever rests should be an inch and a quarter, and the holes through which they pass, an inch and a half in diameter. The position of these holes is sufficiently indicated by the figure. The foot of the beam, when the machine is in action, is secured by stakes represented at G, driven into the earth. The ram D, which is made of oak, elm, or some other strong wood, is capped with three strong iron spikes, represented at *f*, which take fast hold of the tree. This ram is six or eight inches square; and a slit is cut lengthwise through the middle of it, from its lower end at K to the first ferule *a*, in order to allow room for the chain *gh* to play round the pulley K, which should be four inches thick, and nine inches in diameter. This ram is raised by means of the chain *gh*, which should be about ten feet long, with links four inches and three quarters in length, and an inch thick. One end of this chain is fastened to the top of the beam at C, while the other, after passing through the lower part of the ram, and over the pulley K, terminates in a ring or link, represented N° 3, the two ears *mn* of which serve to keep it in a true position between the two planks of the beam. In this ring the hook P is inserted. The hook is represeted in profile N° 2, where F is the part that takes hold of the ring. But it must be observed, that the parts of this machine, represented in N° 2, 3, are drawn on a scale twice as large as the whole engine. The hook F, N° 2, should be made of very tough iron, as well as the handle D, and the arch E*c*. This handle should be two inches thick at *z*, where it joins to the hook, and the thickness gradually lessens by degrees up to the arch, which need not be more than half an inch thick. On each side of the pin *z*, is a semicircular notch, *x*, *y*, which rests alternately on the pins when the machine is worked. The hole D, and the arch E*c*, serve to fix a long lever of wood EF, N° 1, by means of two iron pins; and by this contrivance the lever is either raised or depressed at pleasure, in order to render the working of the machine easy in whatever part of the beam the lever may be placed; for without this contrivance the extremity of the lever EF, would, when the handle is near the top of the beam, be much higher than men standing upon the ground could reach. It must however be remembered, that the lever is often shortened by this contrivance, and consequently its power lessened.

The machine is worked in the following manner: It is placed against a tree, in the manner represented in the figure, so that the iron spikes at *f* may have hold of the tree, and the end of the beam A be supported by stakes represented at G. The iron handle N° 2, is placed in the opening between the two planks of the beam, and the wooden lever fixed to it, by means of the iron pins already mentioned. The hook F takes hold of the chain, and one of the iron pins is thrust into the outer row of holes, by which means the outer notch *x* will rest on the pin, which will be now the centre of motion; and the end of the lever E, N° 1, being pressed downwards, the other notch *y*, N° 2, will be raised, and at the same time the chain, and consequently the ram. The other iron pin is now to be thrust into the hole in the inner row, next above that which was before the centre of motion, and the end of the lever E elevated or pushed upwards, the latter pin on which the notch *y* rests now becoming the centre of motion. By this alternate motion of the lever, and shifting the pins, the chain is drawn upwards over the pulley K, and consequently the whole force of the engine exerted against the tree. There is a small wheel at L, in order to lessen the friction of that part of the machine.

From this account the reader will very easily perceive that the machine is nothing more than a single pulley compounded with a lever of the first and second order. It must, however, be remembered, that as the push of the engine is given in an oblique direction, it will exert a greater or lesser force against the horizontal roots of the tree in proportion to the angle formed by the machine with the plane of the horizon; and that the angle of 45° is the maximum, or that when the machine will exert its greatest force against the horizontal roots of the tree.

BERNABEI, Ercole, in *Musical Biography*, the scholar and successor of Benevoli at St. Peter's, and instructor of the abate Steffani, may be ranked among the greatest masters of harmony, in the ancient ecclesiastical style, of the 17th century. This composer being invited by the elector of Bavaria to Munich, about the year 1650, entered into the service of that court, where he continued the rest of his life. His son, Guiseppe Ant. Barnabei, after following his father's steps in the study of ecclesiastical harmony, surpassed him considerably

considerable in melody and modulation, as he lived long enough to see a great relaxation in the rigour of ancient rules. There is a canon by this composer in the first volum of Paolucci, page 158, and an excellent Agnus Dei, in P. Martini Sagg. di Contrap. II. 127, extracted from his mass, for four voices, intitled, "Laudate cum lætitia, qui fuistis in tristitia." After succeeding his father as maestro di capella to the elector of Bavaria, by whom he was honoured with the title of conseiller aulique, and publishing several compositions for the church, replete with musical science of the first class, he lived till the year 1732, extending his existence to the great age of eighty-nine.

These masters, with many other good harmonists, in the style of the 17th century, supplied the churches of Italy with innumerable compositions, in which the chief merit consisted in pure harmony, and the contrivance of canon, fugue, and imitation on simple and often insipid subjects; but to these excellencies the best moderns have added melody, a more varied modulation, and not only an attention to long and short syllables, but to the expression of words. In the 15th century almost every mass was composed upon the subject of some well-known song or ballad; but these airs being psalmodic, and a little more lively or varied than canto fermo, admitted of no greater variety of modulation than the ancient chants of the church, upon fragments of which, during the 16th and part of the 17th centuries, it was thought necessary to construct the chief part of choral music. Though the present students in counterpoint at Naples, and other parts of Italy, still exercise themselves in harmonizing canto fermo, the writing masses or motets on the subjects of these chants is seldom done but in pure pedantry, and to give an air of antiquity to dry and fancieless compositions.

The church style of composition was, however, much altered during the 17th century, not only by the imitation of dramatic music, and the introduction of instruments, but by writing in transposed keys, and supplying the deficiencies in the scales, which too strict an adherence to the species of octave, and modes of the church, had occasioned. Indeed, before this time, there was no decision of keys, either in sacred or secular music, according to our present rules of beginning and ending upon the chord major or minor, of the key note, or of some determinate note in the scale. The prohibitions were so numerous in the writings of the old theorists, that if the most regular modern compositions were tried by such rules as subsisted at the beginning of the 17th century, they would appear extremely licentious. No part was to be extended above or below the staff, or five regular lines, on which it was written; the combination of chords was never to be broken by moving to an unrelative harmony; and the intervals of the sharp seventh, the tritonus, or sharp fourth, false fifth, sharp second, and even the major sixth, were prohibited. Indeed, an excellent composition might now be produced, merely from ancient disallowances.

BERNACCHI, Antonio, an eminent opera singer, who first arrived in England in 1716, as second man, while Nicolini was the first. Bernacchi's voice seems to have been feeble and defective, but he supplied the defects of nature by so much art, that his performance was always much more admired by professors than by the public in general. He staid here at this time but one year, after which he went back to Italy; but returned in 1729. After quitting the stage, Bernacchi established a school for singing at Bologna, where he had himself been educated, under the celebrated Pistocchi, and where he formed several admirable scholars, who rendered his name and school famous. He came to England a second time in 1729, when he was past his meridian; his voice was never good, but now little was left, except a refined taste, and an artificial manner of singing, which only professors, and a few of the most intelligent part of an audience, could feel or comprehend. After he quitted the stage, he retired to Bologna, where he formed so many great vocal performers by his instructions, that to have been of Bernacchi's school was almost sufficient to establish the reputation of a young singer.

BERNADA, or Bernalda, in *Geography*, a town of Italy, in the kingdom of Naples, and province of Calabria Ultra, 5 miles west of St. Severina.

BERNAGORE, a town of Hindoostan, in the country of Bengal, on the eastern bank of the Ganges, 10 or 12 leagues below Chinsurah, and 5 miles N.W. of Moorshedabad. The coarsest sorts of blue handkerchiefs are made here. It is famous on account of the great number of ladies of pleasure, who reside there, and who pay a monthly recognition to the fiscal of Chinsurah, for the free exercise of their profession. It belonged to the Dutch; but was taken by the British forces in October, 1803.

BERNAL, a hill on the west coast of New Mexico, near the coast, and 4 leagues W.S.W. of the burning mountain of San Salvador. N. lat. about 13°. W. long. about 93°.

BERNARD, in *Biography*, abbot of Clairvaux, and a saint of the Romish church, was born of a noble family at Fontaine in Burgundy, in 1091, and educated at the church of Chatillon, where he manifested at an early period an ardent spirit of devotion. At the age of 23, he, and 30 of his companions, entered into the abbey of Citeaux, lately founded by St. Robert. Here he acquired such reputation, that, within two years, viz. A.D. 1115, he was deputed, with a colony of monks, to found the abbey of Clairvaux in the diocese of Langres, of which he was created the first abbot, and where he continued, without seeking or accepting any higher preferment. In a short time he found himself at the head of 700 novices; and, by his eloquence and zeal, Clairvaux became a seminary of the most distinguished reputation, so that, during the life of the founder, it produced one pope, six cardinals, and thirty prelates. In this retreat the influence of Bernard was greater than if he had occupied the throne of St. Peter; he was consulted as an oracle; his censures were regarded with awe in the remotest parts of Europe; and the Cistercians, by his example, became so powerful, that he lived to see the establishment of 160 convents, which acknowledged him as their head. Having exerted himself in restoring peace to the church, which had been interrupted by the schism that had happened between the years 1131 and 1138, he engaged in combating the supposed heresy of Abelard, who had propagated some opinions that were thought to militate against the doctrines of the church, and succeeded in procuring his condemnation by the council of Sens, in 1140. He also refuted the errors of Peter de Bruys (see Petrobrussians); combated the fanaticism of the Apostolics; resisted the monk Raoul, who recommended the extermination of the Jews; contended against the followers of Arnold of Brescia; and caused Gilbert de la Porrie, and Eon de l'Etrile, to be condemned by the council of Rheims, in 1148. But his influence was much more signally exerted in promoting the second crusade against the Saracens. In this romantic expedition, he engaged, by his eloquence, Lewis VII. of France, with his principal nobles, and the emperor Conrad; and he boasts, that from Constance to Cologne, he emptied cities and castles of their inhabitants, and verified the prediction of only one man being left to seven women. Miracles of various kinds were reported to have attended his missions, and he obtained the appellation of "Thaumaturgist," or wonder-worker of the west. The enterprise which he had entruled with Conrad and Lewis proved unfortunate; and the abbot, who had predicted their success, incurred a variety of censures and reproaches on account of the calamities which he had been

been instrumental in bringing upon Europe. He attributed its failure to the sins of the croises, which had hindered the accomplishment of his prophecies. How far he was affected by the discomfiture and general distress in which this expedition terminated, or by the accusations he suffered, it is impossible to say. However, it is certain that he did not long survive that disastrous event; for he died at Clairvaux, in 1153, in the 63d year of his age.

Few men possessed a more extensive and uncontroulable command over the minds of men than St. Bernard: and his influence was wholly owing to his personal qualifications. But though he had an absolute command by his eloquence and writings, he seems to have been more an enthusiast than a politician, and to have wanted worldly wisdom to direct and manage the various engines which he put into motion. With good intentions he blended passion and prejudice, and the love of power. He was, without doubt, a man of distinguished piety, as well as integrity; and, considering the time in which he lived, an elegant and learned scholar. Erasmus gives the following character of him: "Christianè doctus, et sanctè facundus, et piè festivus." As a writer, he was copious; his style was characterized by force, vivacity, elevation, and sweetness; and his imagination furnished him with figures of comparison and strong antitheses in great variety and abundance; so that he has been regarded as the last of the fathers formed upon the models of St. Ambrose and St. Augustin. The best edition of Bernard's works is that of the learned Benedictine Mabillon, in 2 vols. fol. first printed at Paris in 1666, 1667, and reprinted in 1690 and 1719. A Latin impression of this edition was made at Venice, in 6 vols. fol. Cave's Hist. Lit. ii. p. 186. Gen. Dict. Nouv. Dict. Hist. Mosheim's Eccl. Hist. vol. iii. p. 66.

Bernard *of Menthon*, the founder of a religious community, was born in the Genevois in 903, and descended from one of the most illustrious houses of Savoy. Having dedicated himself to the ecclesiastical profession, he retired to Aosta, a small town at the foot of the Alps, and became archdeacon of its church. Here he employed himself in missions among the unconverted Pagans, who inhabited the mountains, and proselyted them to Christianity. Having witnessed the hardships and dangers encountered by the French and German pilgrims, in their passage to Rome over the Alps, which Hannibal had anciently traversed with singular fortitude and perseverance, this benevolent monk founded two monasteries, or hospitia, for their relief, on Mont-joux, called from him "Great and Little St. Bernard." These were peopled with canons-regular of St. Augustin, and Bernard himself became their first provost. He obtained several important privileges for his establishment from successive popes, and it acquired great popularity and large possessions. Bernard died at Novara, at the age of 85, and was canonized by the Romish church. His institution has undergone a variety of vicissitudes, and lost great part of its riches; but it still subsists, and is eminently useful. There are ordinarily between twenty and thirty monks belonging to the convent; eight of whom are usually dispersed among the Alpine parish churches, under their patronage; and ten or twelve constantly reside, being such as, from their age and health, are able to bear the keen atmosphere of the mountain. The few others, who can no longer bear it, are permitted to reside with the aged provost of the whole, in a house belonging to the convent, and situated at Martigny below. The monks of the mountain are industriously employed in the prosecution of their private studies, in the instruction of their novices, in the education of some scholars who are sent to board and lodge with them, and in managing the temporal economy of the whole. They have a prior, the deputy of the provost, and governor of the convent in his absence; a sacristan, who takes care of their chapels; a cellarer, serving as purveyor, comptroller of the kitchen, and managing all the exterior concerns of the monastery, a clavandeer, who keeps the keys, and dispenses the requisite articles to the monks and to the travellers; and an infirmier, who takes care of the sick in the apartment appropriated to them. The cellarer keeps twenty horses constantly employed during the summer in fetching the magazines of flour, bread, cheese, liquors, and dried fruits, for themselves and their guests; and forage for the milch cows and fatting cattle, during winter. Their firewood, of which they expend a great quantity, is brought to them on the backs of mules, from the distance of four leagues, and by a steep path, that is passable only for six months in the whole year. Before the winter sets in, they send down their horses for the season to a farm which they have on the northern side of the Rhone. To a sympathising and compassionate mind it is peculiarly pleasing to observe the solicitude of these amiable monks on such days as the pass is most frequented, in personally receiving, warming, and recovering travellers, that are exhausted by their excess of fatigue, or indisposed from the severity of the air. With equal attention they relieve both their own countrymen and foreigners. They make no distinction of state, sex, or religion; and ask no questions concerning the country or the creed of the wretched. In winter and in spring, their solicitude has a larger range of attention and activity. From that very time nearly, in which Hannibal conducted an army over Great St. Bernard, and at which the Romans reckoned the general winter of Italy to commence, from the 1st of November, through the winter, to the 1st of May, a trusty Alpine servant, who, as an Alpine, is denominated a Maronnier, and one or two dogs of an extraordinary size accompanying him, are constantly engaged in going to meet travellers a considerable way down the descent towards the Vallais. These dogs possess an instinct, and receive a training, which fit them to be peculiarly useful in their employment. They point out the road to the guide and the travellers, through fogs, tempests, and snows; they have also the sagacity to discover travellers that have lost their way, that have fallen amidst the drifts of snow, and that are lying upon them, wearied and exhausted. The monks themselves often accompany the guide, and aid him in administering necessary relief. Apprized of the benumbing and stupefying effect of extreme cold, they rouse the sleeping travellers, and exert themselves in a variety of ways in preserving and recovering them from approaching or apparent death; and in doing this, they expose themselves to great danger. In order to avoid the numbness occasioned by the cold, they carry with them short thick staffs, armed at the ends with iron, and with these they continually strike their hands and feet. About three miles below the convent, on the road of Hannibal's ascent, they have built a small vaulted room, called the hospital, which is intended for the casual refreshment of travellers benumbed, and unable to reach the convent. The trusty Maronnier visits it frequently, in order to meet the traveller; but principally at the approach of night, and on his return leaves bread, cheese, and wine. On extraordinary occasions, when a storm subsides, he sallies forth to this building, with his stock of wine and meat, and assists all whom he finds distressed. The monks themselves are often seen on the tops of their rocks, watching opportunities for the exercise of their humanity. When the snow just fallen is deep on the ground, they employ themselves in making roads through it, and thus by timely vigilance prevent many fatal accidents. But notwithstanding all their charitable efforts, scarcely a winter passes in which some traveller is not brought to the convent with his limbs benumbed and frozen. The traveller is sometimes overwhelmed at once, and plunged into the body of descending snow. When he is not very deep, the dogs discover

discover him by the scent, and when they fail, the monk engage in the laborious office. They range upon the snow, and found it with long poles: and they have thus rescued many from imminent danger of being lost. Nouv. Dict. Hist. Saussure Voy. des Alpes, vol. ii. Whitaker on the Course of Hannibal over the Alps, &c. 1794. See BERNARD, in *Geography*.

BERNARD, ANDREW, a Latin scholar, and successively poet-laureat to Henry VII. and Henry VIII., was a native of Thoulouse, and an Augustin monk. He was not only the king's poet-laureat, as it is supposed, but his historiographer, and preceptor in grammar to prince Arthur. He obtained many ecclesiastical preferments in England. The pieces which he wrote under the character of poet-laureat, are in Latin. These are, "An Address to Henry VIII. for the most auspicious beginning of the 10th year of his reign," with an "Epithalamium on the marriage of Francis, the dauphin of France, with the king's daughter;" "A new year's gift," for the year 1515; and "Verses," wishing prosperity to his majesty's 13th year. He has left some Latin hymns; and many of his prose pieces in Latin, written as historiographer to both monarchs, are extant. Warton's Hist. Eng. Poetry, vol. ii. p. 132.

BERNARD, EDWARD, a learned English astronomer and linguist, was born at Perry St. Paul, near Towcester, in Northamptonshire, in 1638, and educated at Merchant-Taylors' school in London, whence he was removed, in 1655, to St. John's college in Oxford. Here he applied himself with the utmost diligence to the study of history, philology, and philosophy: and acquired an accurate knowledge, not only of the Greek and Latin languages, but of Hebrew, Syriac, Arabic, and Coptic: he also directed his attention to the mathematics, which he studied under the celebrated Dr. Wallis. Having taken several academical degrees at Oxford, and engaged the esteem of all who knew him, by his distinguished talents and learning, and no less amiable temper, he removed in 1668 to Leyden, with a view of examining several oriental MSS., and particularly the Arabic version of the three lost Greek books of Apollonius Pergæus's conic sections, brought from the east by James Golius. These books he transcribed, with an intention of publishing them at Oxford, but his design was never executed. Upon his return to Oxford, he resumed his studies with fresh vigour, and by his collation of the most valuable MSS. in the Bodleian library, the result of which he was always ready to communicate, he was engaged in a very extensive correspondence with learned men of most countries. About the year 1669, he was recommended by the famous Dr. (afterwards sir Christopher) Wren, Savilian professor of astronomy at Oxford, to be his deputy, and he succeeded this eminent professor, on his resignation in 1673. He had been previously inducted to the rectory of Cheame in Surry, and appointed chaplain to Dr. Mews, bishop of Bath and Wells. A scheme having been proposed in the university of Oxford, which was chiefly promoted and encouraged by bishop Fell, for collecting and publishing all the ancient mathematicians, Bernard, who first formed the project, assiduously engaged in accomplishing it, by collecting all the old books and MSS. in the public libraries, and drawing up a synopsis of their contents. He also printed, at his own expence, as a specimen of this noble design, a few sheets of Euclid in folio, containing the Greek text and a Latin version, with Proclus's commentary in Greek and Latin, and learned scholia and corollaries. With a view of promoting the study of astronomy, he also undertook an edition of the "Parva Syntaxis Alexandrina," or "Μικρὰ Ἀστρονομία," of which there is an account in the "Veterum Mathematicorum Synopsis," and in which, besides Euclid, are contained the small treatises of Theodosius, Autolycus, Menelaus, Aristarchus, and Hypsicles; but this was never published. In 1676, he was sent to France by king Charles II. as tutor to his two natural sons, by the duchess of Cleveland; but his disposition and habits not being adapted to this situation, he returned, after a year's absence, to his studious retirement at Oxford. During his stay at Paris, however, he cultivated an acquaintance with several learned persons, collated various ancient and valuable MSS., and bought many scarce and curious books for his own library. At Oxford he pursued his studies with renewed alacrity: and besides mathematics, to which he applied according to the duty of his professorship, he devoted himself from inclination to the prosecution of history, chronology, and antiquities. At this time he undertook a new edition of Josephus, which he never completed. In 1683, he visited Holland, for the purpose of attending the sale of Nicholas Heinsius's library, where he purchased many valuable books; and on this occasion he renewed, or contracted an acquaintance with several persons of eminent learning. As he experienced many civilities from the Dutch, and found that in Holland he should enjoy favourable opportunities for making great improvement in oriental learning, he seemed much inclined to settle at Leyden; but disappointed in his expectation of being chosen professor of the oriental tongues in that university, he returned to Oxford. In 1684, he took his degree of doctor in divinity; and in 1691, he was presented to the rich rectory of Brightwell in Berkshire, which, being at the distance of about 9 miles from Oxford, allowed of his occasional residence in this city. Soon after he resigned his professorship of astronomy, which had been for some time irksome and unpleasant to him, in favour of Dr. David Gregory, professor of mathematics at Edinburgh. In 1692, he superintended the preparation of a catalogue of the MSS. in the libraries of Great Britain and Ireland, and in some foreign libraries; and in the following year he married an agreeable lady in the bloom of youth, with whom he lived very happily. In 1696, he attended the sale of Golius's MSS. in Holland; and not long after his return fell into a constitutional decline, of which he died in January 1697; and he was interred in St. John's college chapel. His widow erected a monument of white marble, in the middle of which there is carved the figure of a "heart," circumscribed, according to his own direction, by these words; "Habemus Cor Bernardi." The publications of Dr. Bernard, were some astronomical papers in the Philosophical Transactions, N° 158. p. 567. N° 163. p. 721. and N° 164. p. 747; "A Treatise on the ancient weights and measures," first printed at the end of Dr. Pococke's Commentary on Hosea, and afterwards reprinted in Latin, with great additions and alterations, Oxon. 1688, 8vo.; "Private Devotions, &c." Oxford, 1689, 12mo. "Orbis eruditi literatura a charactere Samaritico deducta," in a large sheet of engraving, exhibiting at one view the alphabets of many nations, together with the abbreviations used by the Greeks, physicians, mathematicians, and chemists; "Etymologicum Britannicum," Oxon. 1689, printed at the end of Dr. Hickes's Grammatica Anglo-Saxonica, &c.; "Chronologiæ Samaritanæ Synopsis," published in the "Acta Eruditorum Lipsiensia," April, 1691. He was also the author of some notes and commentaries, printed in editions of learned works. He likewise assisted several learned persons in their editions of books, and collated MSS. for them. Among his papers were found many MSS. of his own composition, with very large collections; which, together with several of his books, were purchased by the curators of the Bodleian library. The rest of his books were sold by auction. Of his great and extensive learning, his works are a sufficient evidence. Dr. Smith, his biographer, represents him as a man of a meek, mild, and conciliating disposition, averse from contests of

every kind, modeſt in delivering his own opinions on diſputed ſubjects, candid in his judgment of other men's performances, ſteadily attached to the eſtabliſhed church, and at the ſame time liberal in his ſentiments with regard to diſſenters of all denominations, and deſirous of peace and union. His piety was ſincere and unaffected; and his devotions, both public and private, were regular and exemplary. The learned Huetius, in his "Comm. de rebus ſuis," bears this conciſe but very honourable teſtimony to his memory. "Edwardus Bernardus Anglus, quem pauci hac ætate equiparabant eruditionis laude, modeſtiâ vero pene nulli;" i. e. Edward Bernard, an Engliſhman, whom few in this age equalled in erudition, in modeſty ſcarcely any. Biog. Brit. Gen. Dict.

Bernard, James, was born in 1658 at Nions, in Dauphiné, ſtudied at Geneva, and became paſtor of the church in his native province. But being driven from France by perſecution, he ſought refuge firſt at Geneva, then at Lauſanne, and afterwards in Holland, where he was employed as a penſionary miniſter at Gouda. In 1705, he was choſen paſtor of the Walloon church at Leyden, and ſoon after was appointed profeſſor of philoſophy and mathematics in that univerſity, and received a doctor's degree. He cloſed his life of literary labour in 1718. He was the author of ſeveral political and hiſtorical works; in 1699, he undertook the continuation of Bayle's "Nouvelles de la republique des lettres," which he continued till 1710, and reſuming it in 1716, continued it till his death. He alſo wrote a great part of the 20th to the 25th vols. of Le Clerc's "Bibliotheque Univerſelle;" and a "Supplement to Moreri's Dictionary," in 1 vol. fol. Amſt. 1714. He alſo publiſhed ſeveral theological and hiſtorical treatiſes, in the compoſition of which he has diſplayed more learning and induſtry than genius and ſkill. Nouv. Dict. Hiſt.

Bernard, Peter-Joseph, a French poet, was the ſon of a ſculptor at Grenoble, and born in 1708. Having been educated in the college of the Jeſuits at Lyons, where he made rapid progreſs in literature, he rambled to Paris in purſuit of pleaſure and liberty, and for two years employed himſelf as clerk to a notary; but here he publiſhed ſome light poems which attracted notice, and in 1734 he was taken to the campaign in Italy by the marquis de Pezay, and acquitted himſelf with honour at the battles of Parma and Guaſtalla. The commander in chief, the marſhal de Coigne, pleaſed with his talents, appointed him his ſecretary, and procured him the poſt of ſecretary-general to the dragoons. He continued with the marſhal till his death in 1756. He afterwards lived in the circle of faſhion and pleaſure at Paris, till the year 1771, when the loſs of his memory reduced him to a mere ſtate of vegetation, in which he continued till his death in 1776. His works are all in the eaſy, elegant, and voluptuous kind. His firſt performances conſiſt of anacreontics and ſongs, in ſhort and playful meaſures, from which he obtained the appellation of "le gentil Bernard." He afterwarde wrote the opera of "Caſtor and Pollux," and a ballet called "Les Surpriſes de l'amour." His principal poem is "L'art d'aimer," in three cantos, in which are ſeveral tender paſſages, but in point of ſtyle negligently written. His poetical tale, intitled "Phroſine et Melidore," is of ſimilar character. A collection of his works has been publiſhed, and the following lines of Voltaire are prefixed:

"Les trois Bernards."

"Dans ce pays trois Bernards ſont connus:—
L'un eſt ce ſaint, ambitieux reclus;
Prêcheur adroit, fabricateur d'oracles:
L'autre Bernard eſt l'enfant de Plutus,
Bien plus grand ſaint, faiſant plus grands miracles:
Et le troiſieme eſt l'enfant de Phébus,
Gentil Bernard, dont la muſe feconde
Doit faire encor les délices du monde,
Quand de premiers on ne parlera plus."

The ſecond, "Bernard" above mentioned is "Samuel," the famous financier under Lewis XIV., called the Lucullus of the age. Nouv. Dict. Hiſt.

Bernard *of Bruſſels*, a painter of animals and hunting-pieces, in which he excelled, by giving to his wild animals a ſtrong and ſpirited expreſſion. He was patroniſed by Margaret, counteſs of the Netherlands, for whom he deſigned ſubjects for tapeſtry, and in the ſervice of the emperor Charles V. he painted hunting pieces, in which he introduced the portraits of the emperor and of all his attendants. In a picture of the laſt judgment, he covered the pannel with leaf-gold, before he laid on his colours, and thus preſerved them from changing, and gave to his tints a heightened luſtre. This method is ſaid to have produced a happy effect, particularly in the ſky. He died in 1540; the time of his birth is not known. Pilkington.

Bernard, Solomon, an ingenious engraver, was a native of France, and reſided chiefly at Lyons. He worked chiefly for the bookſellers, and his engravings were deſigned with ſpirit, and executed in a clear, neat ſtyle. He appears by his works to be a man of great genius, and fertile invention. His moſt eſteemed performance is a ſet of prints for the Bible. He flouriſhed from 1550 to 1580. Strutt.

Bernard, Francis, doctor in medicine, was principal phyſician to king James II., and in conſiderable practice. He left a large collection of ſcarce and valuable books, which was ſold in 1698, the year after his death, for 1600*l.* His brother Charles, who was ſurgeon to the princeſs Anne, and who had the ſame paſſion for collecting books, left alſo a curious library, which was ſold by auction in 1711. The "Speccio della Beſtia triomfante," by Jordano Bruno, an Italian atheiſt, which was in this collection, was ſold, as we learn from the Spectator, N° 389, for 30 *l.* This book was printed, Ames ſays, in England in 1584, by Thomas Vantrollier. An Engliſh edition of it was printed in 1713. New Gen. Biog. Dict.

Bernard, Christopher. This ſurgeon, who lived in the beginning of the 18th century, is only known as the author of two books, very popular in their time, though now in little requeſt. "The preſent ſtate of ſurgery, with ſome remarks on the abuſes committed in it," London, 4to. 1703. "The crafts and frauds of phyſic exploded, diſcovering the low prices of the beſt medicines," 8vo. 1703. Haller. Bib. Med.

Bernard, *St.* in *Geography*, a town of Germany, in the archduchy of Auſtria, 2 miles N.W. of Horn.—Alſo, an iſland of North America, in the lake of Nicaragua.

Bernard, ſouth end of a ſmall ſand between Southwold and Leoſtoff, on the coaſt of Suffolk, the north end of which is called "Newcomb," about a mile from the ſhore, within which ſmall veſſels may paſs in good weather and a full ſea.

Bernard *River*, a river on the weſt coaſt of France, which falls into the bay within the iſland of Belleiſle.

Bernard's *Bay*, lies on the N.W. ſide of the gulf of Mexico. The paſſage into it, between ſeveral iſlands, is called Paſco de Cavallo. N. lat. 28° 30′. W. long. 96° 16′.

Bernard, *Great St.*, a mountain which is a branch of the Alps (the Alpes Penninæ of ancient writers), that ſeparates the Lower Vallais from Savoy, and particularly from the duchy of Aoſta, in the principality of Piedmont, and from which flows into the former country the river Drance, and into the latter, the Doire. On the ſummit of this mountain is the monaſtery of St. Bernard (ſee Bernard), ſuppoſed to be 8006 feet above the level of the Mediterranean. N. lat. 45° 48′. E. long. 7° 2′. It was by this track that Hannibal is ſuppoſed to have conducted the Carthaginian army into Italy;

Italy; and it was in the same direction that Bonaparte, the consul of France, led his army of reserve over the Alps, previously to the battle of Marengo, in the year 1800.

Bernard, *Little St.*, a part of the Alps (anciently Alpes Graiæ), separating the duchy of Aosta from Savoy, and lying to the south-west of the former. Over this lies a road into Savoy, and upon it is a monastery or hospitium for the convenience of travellers.

Bernard *the Hermit*, in *Entomology*, the name by which *Cancer bernhardus* is very commonly known. This creature is also called the hermit crab; a name indiscriminately applied to all the parasitical species of the cancer genus; or, in other words, to all those which, having no shelly covering to protect the body, inhabit the shells of whelks, or other testaceous animals. See Pagarus *Fabr.*

BERNARDI, Steffano, in *Biography*, was a learned theorist in *Music*, as well as composer of masses and madrigals of a most elaborate and correct kind. He flourished from 1611 to about 1634, and in 1623 was maestro di cappella of the Duomo at Verona. He published a didactic work, called "Porta Musicale," the first part of which appeared at Verona, 1615, in quarto; and, as an elementary tract, it has the merit of clearness and brevity.

BERNARDIA, in *Botany*. See Adelia.

BERNARDIN, in *Biography*, a Romish saint, denominated *of Sienna*, was born at Massa, in Tuscany, in 1380, according to Mr. Warton, but in 1383, according to M. Du Pin. After studying at Sienna, he entered into the confraternity of the hospitallers of la Scala, and distinguished himself by his attendance on those who were afflicted with the plague. In 1404 or 1405, he became a member of the Franciscan order, and afterwards an eminent preacher. Besides the natural and acquired talents which he possessed, the power of working miracles was ascribed to him both during his life and after his death. He visited Jerusalem under the character of commissary of the Holy Land, and after his return visited several cities of Italy, where he preached with great applause. Being accused to pope Martin V. for maintaining some erroneous opinions, he explained himself to the satisfaction of the pontiff, and was absolved. Such were his humility and self-denial that he refused several bishoprics, and contented himself with the office of vicar-general of the observance of St. Francis in Italy, and as such, reformed, or newly founded 300 monasteries. He died at Aquila in Abruzzo in 1444, and was canonized in 1450 by pope Nicholas V. He left several works, which were printed at Venice in 1591, 4 vols. 4to.; and at Paris in 1636, 2 vols. fol. They consist of religious treatises, sermons, commentaries on the Apocalypse, &c. Du Pin. Gen. Dict.

Bernardin, or *Bernhardin*, in *Geography*, a mountain of Switzerland, being part of the Alps, separating the district of Rheinwalden from the vallies of Calanca and Masox. In this mountain springs the river Musa, which flows down the Val Masox, and forms a junction with the Tesino, above Bellinzone.

BERNARDINS, or Bernardines, in *Ecclesiastical History*, the name of a religious order, differing very little from the Cistercians. They derived their name and order from St. Bernard, abbot of Clairvaux, who was considered as the second parent and founder of the Cistercians. (See Bernard.) Their usual habit is a white gown, with a black scapulary; but when they officiate, they put on a large white coul with great sleeves, and a hood of the same colour.

BERNARDO, St., in *Geography*, an island, or rather group of islands in the South sea, called St. Bernardo of Mendana, and supposed by M. Fleurieu, in his "Discoveries of the French in 1768 and 1769, &c." to be Mr. Byron's "Isles of Danger." Mendana says, that St. Bernardo is in S. lat. 10° 30', and 1400 (Spanish) leagues from Lima, i.e. allowing Lima to be in W. long. 77° 50', and 1400 leagues in the latitude of 10° 30' to make 81° 30' of longitude, the longitude of St. Bernardo will be about 159° 20'. But the situation of St. Bernardo may be more accurately determined from that of the Marquesas, placed by Capt. Cook, in his second voyage, in W. long. 139° 9': for Figueroa says, that Mendana sailed west 400 (Spanish) leagues from the Marquesas, before he made St. Bernardo; and 400 Spanish leagues in the lat. of 10°, making 23° 13' difference of longitude; if this be added to 139° 9', we shall have 162° 22' W. for the longitude of St. Bernardo. Com. Byron places the Islands of Danger in S. lat. 10° 58', and W. long. 169° 53'; but Mr. Wales, who collated and published the astronomical observations which were made in Hawkesworth's voyages for the Board of Longitude, reduces this longitude to 165° 59' W., exceeding that of Mendana only by 3° 37'. Mr. Fleurieu joins M. Pingré (see "Memoire sur le Transit de Venus," Paris 1767, p. 51.) in thinking that this island is not the same with that which Quiros saw, and called St. Bernardo, in 1605; but Mr. Dalrymple thinks that they are the same; and it is probable that Quiros thought so; for in enumerating *his own* discoveries to Philip II. of Spain, in the memorial which he presented to that monarch (see "Dalrymple's collection," vol. i. p. 145.) he omitted this island, whence it may be inferred, that he thought it to be a discovery which belonged to another person.

Bernardo, *St. de Tarijah*, a town of South America, and principal of the district of Chicas, or Tarijah.

BERNARDSTOWN, a township in Somerset county, New Jersey, America, containing 2377 inhabitants, including 93 slaves.—Also, a township in Hampshire county, Massachusetts, containing 691 inhabitants; distant 110 miles W. from Boston.

BERNASCONI, Andrea, in *Biography*, born at Verona, but who resided chiefly at Venice, was a pleasing and graceful composer. He flourished at the same time as Hasse, and though inferior to him in force and resources, it is said that Faustina, the wife of Hasse, used to prefer the melodies of Bernasconi. He resided long at Munich, in the service of the elector of Bavaria, where he died about the middle of the 17th century.

Bernasconi, *La Signora*, daughter of the composer of that name, arrived in England, 1778, as first woman at our lyric theatre, when Pacchioretti appeared there for the first time. She had gained considerable reputation as an actress at Vienna, in the part of Eurydice, when she sung with Millico in Gluck's Orfeo, which had such great success from its novelty of style; that ascribing part of this success to the Bernasconi's vocal powers, we expected more than we found. And little is to be said of her as a performer, except that she had a neat and elegant manner of singing, though with a voice that was feeble, and in decay.

BERNAU, in *Geography*, a town of Germany, in the archduchy of Austria, 5 miles south of Wels.—Also, a town of Germany, in the circle of Upper Saxony, and middle mark of Brandenburg, surrounded with walls, ramparts, and ditches, containing three churches; the principal commerce of which is beer, of which large quantities are brewed in this town; 14 miles N.N.E. of Berlin.

BERNAVILLE, a town of France, in the department of the Somme, and chief place of a canton, in the district of Doullens, 2½ leagues south-west of Doullens. The population of this town consists of 984, and that of the canton of 9994 persons. The territorial extent contains 185 kilometres, and 27 communes.

BERNAY, a town of France, and principal place of a district, in the department of the Eure; 7½ leagues west of Evreux. Its population amounts to 6142, and that of the canton to 14,957 persons. Its extent in kilometres is 167½, and

and it contains 21 communes. N. lat. 49° 6′. E. long. 0 50′.

BERNBURG, in Latin *Bernburgum*, *Arctopolis*, and *Urſopolis*, a town of Germany, in the circle of Upper Saxony, the capital of Anhalt Bernburg, and the reſidence of the prince, ſeated on the Sala. It is divided into the Old and New Town, which had each its own magiſtracy, till they were united in 1560; beſides which, there is a third part, called "Vordenburg," ſeated on a hill on the other ſide of the Sala, under a diſtinct magiſtracy. The church in this part ſerves for the caſtle and the court. The caſtle is one of the moſt ancient and moſt celebrated fortreſſes in the principality of Anhalt; 20 miles weſt of Deſſau. N. lat. 51° 55′. E. long. 12° 36′.

BERNCASTEL, a town of Germany, in the circle of the Lower Rhine, and electorate of Treves, and chief place of a canton, in the diſtrict of Treves, and department of the Sarre, ſeated on the Moſelle, and owing its privileges to the emperor Rodolphus I.; 8 miles E.N.E. of Treves. Its population includes 1263, and that of the canton 11,718 perſons. It contains 34 communes. N. lat. 50° 1′. E. long. 6° 36′.

BERNE, a townſhip of America, in Albany county, New York. According to the ſtate cenſus of 1796, there appear to be 477 electors.

BERNECK, a town of Germany, in the circle of Franconia, and principality of Bayreuth.

BERNECOURT, a town of France, in the department of the Meurte, and chief place of a canton in the diſtrict of Pont-a-Mouſſon, 3 leagues S. W. of Pont-a-Mouſſon.

BERNERA, or Berneray, one of the weſtern iſlands of Scotland, is only about four miles in length, and one and a half in breadth. The ſoil of it is ſandy, but when well manured proves extremely fertile, and produces ſome fine corn and clover paſtures. It has a freſhwater lake, called Lochbruis, which has ſome ſmall iſlands, and abounds with eels. Theſe are frequently caught in great numbers by the inhabitants, who reſort in the night, with lights, to a ſmall rivulet, where the eels are found going towards the ſea. They are often caught twiſted together in heaps. The tides of the ſea often produce very ſingular effects round this iſland. In their ordinary courſe the flood runs eaſt in the Frith, where Bernera lies, and the ebb runs weſt; the ſea ebbing and flowing regularly for four days before, and as long after the full and change of the moon. The ſpring tides commonly riſe to the height of 14 feet perpendicular, and the others proportionably; but for four days before and after the quarter moons, there is a ſingular variation; at thoſe times the tide runs eaſtward for twelve hours ſucceſſively, from nine o'clock in the morning till nine at night, when the current turns, and runs weſtward for the twelve following hours. Thus the reciprocations continue; one flood and ebb running eaſtward, and another weſtward, till within four days of the full and change of the moon, when they reſume their ordinary courſe, running eaſt during the ſix hours of flood, and weſt during the ſix hours of ebb. There is another phenomenon in theſe tides equally remarkable. Between the vernal and autumnal equinoxes, the tides about the quarter moons run all day to the eaſt, and all night to the weſt; and during the other ſix months, their courſe is reverſed, being weſtward in the day, and eaſtward in the night. The number of inhabitants in Bernera and the iſle of Pabbay, which lies between the former and Harris, was 494 in the year 1792. W. long. 7° 30′. N. lat. 67° 45′. The Rev. Mr. M'Leod's Account in Sir J. Sinclair's Statiſtical Hiſtory of Scotland.—Alſo, a town of Scotland, in the county of Inverneſs, in which are barracks; 32 miles N.W. of Fort William.

BERNESSO, a town of Piedmont, in the diſtrict of Coni, 4½ miles W. N. W. of Coni.

BERNEVILLE, a town of France, in the department of the Straits of Calais, and chief place of a canton, in the diſtrict of Arras, 4 miles S. W. of Arras.

BERNEUT Bay, lies at the point of Quiberon, on the coaſt of France.

BERNEX, a town of Savoy, 2½ miles N.N.E. of St. Julien.

BERNHARDUS, in *Entomology*, a ſpecies of Cancer, with heart-ſhaped, muriated hand claws; that on the right ſide largeſt. Inhabits whelks, &c. common on moſt ſea-ſhores. See Bernard *the Hermit*.

BERNHARTS, in *Geography*, a town of Germany, in the archduchy of Auſtria, 7 miles E.S.E. of Feldſburg.

BERNI, or Bernia, Francis, in *Biography*, an Italian poet, was a deſcendant of a noble but indigent family of Bibiena, in Tuſcany, and born at Campovecchio about the cloſe of the 15th century. He paſſed the firſt 19 years of his life in poverty at Florence; and though he was afterwards patronized by cardinal Bernardo of Bibiena, Angelo, and Giberti, biſhops of Verona, his love of unreſtrained liberty, and inclination to pleaſure and raillery, prevented his deriving any permanent advantage from their patronage. At Rome, however, he was greatly eſteemed by the literati, and was one of the moſt illuſtrious members of the famous academy "De Vignajuoli." At length, he retired to Florence, and ſubſiſted on a canonry in the cathedral, under the protection of cardinal Hippolito de' Medici, and duke Alexander It has been ſaid, that he was taken off by poiſon, becauſe in a quarrel between theſe two princes, he refuſed to comply with the deſire of one of them, who requeſted him to adminiſter poiſon to the other. The æra of his death, as well as the truth of this ſtory, are uncertain: it has been fixed by ſome to the year 1536; but others have ſuppoſed that he lived to a later period. Mr. Roſcoe, in his "Life of Lorenzo de Medici," ſays, that he cultivated a branch of poetry (a kind of burleſque) with ſo much ſucceſs, that it has from him obtained the name of "Berneſche." The characteriſtic of this ſpecies of poetry is an extreme ſimplicity, which the Italians denominate "ideotiſmo." The moſt extravagant ſentiments, the moſt ſevere ſtrokes of ſatire, are expreſſed in a manner ſo natural and eaſy, that the author himſelf ſeems ſcarcely to be conſcious of the effect of his own work. Perhaps the only indication, ſays Mr. Roſcoe, of a ſimilar taſte in this country, appears in the writings of the facetious Peter Pindar. Berni, though he ſeems to have blotted and corrected much, has nevertheleſs not been ſufficiently careful in expunging licentious images, and free equivoque; and his wit is often mere buffoonery. One of his principal performances, was the recompoſition of Boiardo's "Orlando Inamorato," which he has rendered much more pure and poetical. The beſt edition of it is that of Venice, in 1545. His other poems were collected and publiſhed, with thoſe of other burleſque writers, in 1548, in 2 vols. 8vo. and reprinted at London in 1721 and 1724, after the edition of Venice. Berni was a cauſtic ſatiriſt, and the avowed enemy of Peter Aretin, whoſe life he wrote in a ſtrain of bitter invective. He excelled in Latin poetry, and imitated the ſtyle of Catullus with ſucceſs. Gen. Biog.

BERNICIA, in *Britiſh Geography*, one of the kingdoms of the Saxon heptarchy. Although the Saxons, ſoon after the landing of Hengiſt, had been planted in Northumberland, their progreſs was ſlow in overcoming the obſtinate reſiſtance with which they were oppoſed, and none of their princes for a long time aſſumed the appellation of king. At laſt, in 547, Ida, a Saxon prince of great valour, who claimed a deſcent, as did all the other princes of that nation, from Woden, brought over a reinforcement from Germany, in

ro ships, which arrived at Flamborough, and enabled the Northumbrians to carry on their conquests over the Britons. He entirely subdued the country, now called Northumberland, the bishopric of Durham, as well as the counties of the Merse and the three Lothians, or the whole eastern coast of the ancient Roman province of Valentia; and assumed the crown under the title of king of Bernicia. About the same time, Ælla, another Saxon prince, having conquered Lancashire, and the greater part of Yorkshire, or all the country between the Humber and the Tyne, founded another little state in these parts, which was called the kingdom of "Deira," or "Deiri." These two kingdoms were united, not long after, in the person of Ethelfrid, grandson of Ida, who married Acca, the daughter of Ælla; and expelling her brother Edwin, established one of the most powerful of the Saxon kingdoms, by the title of *Northumberland*, which see. See also Heptarchy.

BERNICLE, in *Conchology*. See Barnacle.

Bernicle, in *Ornithology*. See Barnacle *goose*.

BERNIER, Francis, in *Biography*, called the *Mogul*, from his long residence in the court of that prince, was born at Angers in France, about the year 1630. After receiving a liberal education, and taking his degree of doctor in medicine at Montpelier, he went, in 1654, to Palestine, and thence to Egypt. At Cairo he resided about twelve months, and having examined the pyramids, and every thing there deserving attention, he embarked at Suez for the kingdom of the Mogul, and was engaged by Aurengzebe as his physician, in which office he continued, attending that prince in his expeditions for the space of 12 years. Desirous at length of revisiting his native country, and obtaining leave of the Mogul, he returned to France in 1670. He now employed himself in digesting and arranging the observations he had made in his travels, and published in succession, in French, the history of the last revolution of the states of the great Mogul, a letter on the state of Hindoostan, and memoirs and particular observations. These were collected and published together, in 1699, at Amsterdam, under the title of "Voyages de Fransois Bernier, contenant la Description des etats du grand Mogul, de l'Hindoustan, du royaume de Kachemire, &c." 2 vols. 12mo. They are esteemed the most perfect account of those countries extant. Captive princes here, says he, destined to die, were compelled to take daily a preparation of poppy, which kept them in a constant state of drowsiness, until life was gradually and quietly extinguished.

To the abstemious life of the Indians, he attributes their freedom from gout, stone, catarrh, and quartan fever. Even the lues venereal is here, he says, less malignant than in Europe.

He also published an abridgment of the philosophy of Gassendi, and other tracts, contained in various periodical publications. In 1685, he came to England, and after a short residence here, returned to Paris, where he died, Sept. 22, 1688. Haller. Bib. Med. New Gen. Biog. Dict.

Bernier, John, born at Blois, received the degree of doctor in medicine at Montpelier, in 1647. Not succeeding in his practice, and finding persons whom he esteemed less qualified, in full employment, his writings are filled with satyrical reflections on his more fortunate brethren. His principal work is, "Essais de Medicine, ou il est traité de l'Histoire de Medicine, et des Medicines, &c." Paris, 1689, 4to, to which he added a supplement in 1695. He also published "Histoire de Blois;" which is not much esteemed. Also, "Antimenagiana, des Reflections, Pensees, Bons Mots, et Anecdotes," which he signs by the name of Poppin-court, and a critique on the works of Rabelais, whom he severely censures. Eloy. Dict. Hist.

Bernier, Nicholas, an eminent French musician, was born at Mantes-sur-Seine, and became music-master of the holy chapel at Paris, and afterwards of the chapel royal. He was much esteemed and patronized by the duke of Orleans, who submitted his own compositions to his judgment. By his five books of cantatas, for one and two voices, with the words in part by Rousseau and Fuselier, he acquired great reputation. He also published "Les Nuits des Sceaux," and a number of motets, which are still admired. He died in 1734. Nouv. Dict. Hist.

BERNIN, in *Geography*, a town of France, in the department of the Isere, and chief place of a canton, in the district of Grenoble, 8 miles north of Grenoble.

BERNINI, John Lawrence, in *Biography*, a celebrated sculptor and architect, was the son of a sculptor, and born at Naples in 1598. At a very early age, he manifested the inclination of his genius; for upon the removal of his family to Rome, when he had attained only the age of 10 years, he shut himself up from morning till night in the Vatican, for the purpose of copying the master-pieces which it contained. Having about this period wrought a head in marble, that excited great admiration, he was sent for by pope Paul V. who desired him to sketch with a pen the head of St. Paul, in his presence; upon which the young artist designed it so well, that the pontiff recommended him to the care of cardinal Maffei Barberini, as one who might become the Michael Angelo of his age. Stimulated by the encouragement he had received, his application was indefatigable, and his perseverance invincible. To this purpose, it is related concerning him, that after having finished with much attention and assiduity a bust of Scipio Borghese, the pope's nephew, he discovered a defect of the marble, in the forehead. Upon this he immediately procured another block, and in the interval of 15 nights he executed another to his satisfaction. When the first was exhibited to Borghese, he could not avoid manifesting his chagrin; but he was agreeably surprised when the second was exposed to his view. Both these are preserved in the villa Borghese. Among the productions of his youth, we may mention his statues of St. Laurence, and of Æneas carrying off his father at the siege of Troy; and more particularly his David and Goliah, which some have reckoned among his best works. His group of Apollo and Daphne, cut from a single block of marble, and the second not more than half a foot from the first, executed for cardinal Borghese, at the age of 18 years, has been regarded as the chef d'œuvre of sculpture. It is said, that when Bernini saw these performances of his youth 40 years afterwards, he lamented the little improvement he had made in sculpture during this long course of years. In the pontificate of Gregory XV. Bernini was created a knight of the order of Christ; whence he has been commonly distinguished by the appellation of the "Chevalier Bernini." Upon the accession of his patron Barberini to the pontifical chair, under the title of Urban VIII. Bernini was engaged in executing the projects which he had formed for the embellishment of Rome. The decoration of the place called the "Confession," in St. Peter's, employed him for 9 years, and for this exercise of his art he was liberally rewarded. He also constructed a fountain, displaying the richness of his invention, in the piazza d'Espagna; decorated the great niches of the pillars, which support the dome of St. Peter's; and constructed a grand mausoleum for the pope, which is one of the finest ornaments of that cathedral. So much did this pope interest himself in the welfare of Bernini, that he urged him to marry; accordingly, in 1639, he commenced a matrimonial union, which lasted 35 years, and produced a numerous family. Bernini's reputation was not confined to Rome; but Charles I. of England, hearing of his fame, sent

over a fine picture of Vandyke, from which he made three busts of the king in different aspects, which gave great satisfaction, and were munificently rewarded. A bust of the queen was intended, but on account of the troubles which occurred in England, was never executed. Bernini was invited to Paris by Lewis XIII. just before the death of Urban VIII., and allured by very lucrative proposals; but the pope upon being consulted, said, "that he was made for Rome, and Rome for him;" and this determined his stay. The grand fountain of the piazza Navona, constructed under the pontificate of Innocent X. is reckoned among his master-pieces. The fine portico of St. Peter's was erected by this artist, under the pontificate of Alexander VII. and about this time queen Christina visited Rome, and treated him with singular respect. In 1664, he was consulted by Lewis XIV. of France, in consequence of the recommendation of Colbert, concerning the improvement of the Louvre; and at the age of 68 years yielded to an urgent invitation to visit Paris for this purpose. In his journey thither, he was honoured in various places through which he passed, by the most respectful attention; and after his arrival, he began with making a bust of the king, and while he was sketching his portrait, turned back his curls for a better discovery of his forehead, observing at the same time, with the politeness of a courtier, "that he was a king who might freely shew his face to the whole world." This, it is said, gave rise to a French fashion, denominated "frisure à la Bernin." His design for the completion of the Louvre was not executed. He returned to Rome before winter, and as an acknowledgment of his obligations, for the civility and munificence with which he was treated by Lewis, formed a colossal equestrian statue, representing the king as supported by a rock. Upon its removal to Paris, Girarden changed it, on account of its want of sufficient resemblance to the monarch, into a Curtius leaping into the fiery gulf. Among the remaining works in which he employed himself, the most considerable was the tomb of Alexander VII. in St. Peter's. Whilst he was repairing the old chancery palace, by order of Innocent XI. he was seized with a fever, which terminated in an apoplexy, that closed his life in 1680, in the 82d year of his age. His funeral procession to the church of St. Maria Maggiore was attended by all the nobility of Rome.

The genius of Bernini was singularly fertile and comprehensive; and on a medal struck in honour of him by Lewis XIV. he is characterized as "singularis in singulis, in omnibus unicus," i. e. singular in each, sole in all. Several of his pictures, painted for his amusement, amidst his other occupations, and sufficiently indicating his talents in this department of the arts, are preserved in the Florentine gallery, and the Barberini and Chigi palaces. In architecture he displayed a fine taste and rich imagination, though he is said to have departed from the rules and proportions observed by the ancients. But he owed his highest and most distinguishing reputation to sculpture. D'Argenville, however, observes, in his "Vies des Architectes et des Sculpteurs," that, whilst he wrought marble with a surprising suppleness, admirable taste, and singular graces, he often deviated from truth, and was much of a mannerist; that he abandoned the simple drapery of the Grecian statuaries; and that he enveloped his figures with such an assemblage of folds and doublings as to disguise and partly conceal them by the flutter and seeming agitation of their dress. Some of his single busts, or portraits after nature, are much admired, and are said to retain the whole spirit and character of the original. His St. Theresa in ecstasy is thought to surpass all his other works for expression. His own talents he estimated with modesty; but by an enthusiastic attachment to his art, and unwearied assiduity in the exercise of it, he arrived at that eminence for which he was distinguished, and multiplied his works to such a degree as to occasion its being said, that posterity would be apt to suppose as many Bernini's as Herculeses. Encyclop. Beaux Arts, t. ii. p. 1. p. 282. Gen. Biog.

BERNINO, in *Geography*, a mountain of Swisserland, being a branch of the Rhetian Alps, about 26 miles N. E. of Chiavenna.

BERNO, in *Biography*, abbot of Richenon, in the diocese of Constance, flourished about the year 1008, and is celebrated as a poet, rhetorician, musician, philosopher, and divine. Of his works, the principal are his treatises "De Instrumentis Musicalibus;" "De Mensura Monochordi;" and "De Musica seu Tonis;" containing a summary of the doctrines of Boethius, an explanation of the ecclesiastical tones, intermixed with pious exhortations, and the application of the music to religious purposes. His learning and piety recommended him to the special favour of the emperor Henry II. and his endeavours to promote literature were so much encouraged, that his abbey of Richenon was as famous in his time as those of St. Gal, or Cluni, then the most celebrated in France. He died in 1048, and was buried in the church of his monastery.

BERNON, in *Geography*, a town of France, in the department of the Aube, and chief place of a canton, in the district of Ervy; 4 miles S.E. of Ervy.

BERNOUILLI, James, in *Biography*, a celebrated mathematician, was born at Basil, December 27, 1654. His father, who was a man of rank and learning, intended him for the profession of a minister, and paid great attention to his education. Having passed through the usual course of preparatory studies, and taken his degrees in the university of Basil, he applied, in deference to his father's wishes, to divinity; but his inclination leading him to mathematics, he made great proficiency in geometry, without any collateral assistance either of teachers or of books, from the use of which his father rigorously restrained him. In reference to this restraint, he took for his device Phaeton driving the chariot of the sun, with this motto, "Invito patre sidera verso," i.e. I traverse the stars against my father's inclination. Notwithstanding the disadvantages under which he laboured, he made such progress in mathematical studies, that he was able, before the age of 18 years, to solve a difficult problem in chronology, or to find the year of the Julian period, when the year of the cycle of the sun, the golden number, and the indiction, are given. In 1676, he began his travels, and at Geneva taught a blind girl to write; and at Bourdeaux composed universal gnomonic tables. Upon his return to his own country, in 1680, he derived great pleasure from the perusal of Malbranche's "Search after Truth," and Descartes's philosophy: and predicted the return of a comet, of which he gave an account, in a short treatise written in his own language. He soon afterwards travelled into Holland, Flanders, and England; and having completed his peregrinations, he settled at Basil in 1682, and commenced a course of public experiments in natural philosophy and mathematics. In this year he published, at Amsterdam, in Latin, his "Essay of a New System of Comets, in order to calculate their Motions and to foretel their Appearances," 8vo. and in the following year, at the same place, his "Dissertations upon the Weight of the Air;" Lat. 8vo. In 1684, he accepted the professorship of mathematics at Heidelberg, and devoting himself to the assiduous study of these sciences, he took occasion about this time to investigate the analytical system of Leibnitz, contained in some essays on the "Calculus differentialis," or "Infinimens petits;" published in the "Acta Eruditorum;" the extent and beauty

beauty of which he admired, the principles of which he developed, and the utility of which he discovered, and promoted to such a degree, that this great philosopher, whilst he claimed the honour of the original invention, acknowledged that J. Bernouilli and his brother had a great share in the advantage which the public derived from it, and that no person had made a greater use of this invention than they, and the marquis de l'Hospital. In 1687, he was unanimously chosen to succeed Peter Megerlin, as professor of mathematics at Basil, and he discharged the duties of his office with such reputation, that he greatly contributed to the credit of the university, and to the increase of the number of students. In 1699, he was elected a foreign member of the academy of sciences at Paris, and in 1701, of the academy of Berlin. The memoirs of both these societies were enriched by many of his communications. Several of his pieces were also published in the Acta Eruditorum, and the Journal des Scavans. The gout, brought on by unremitting application, produced a fever, which terminated his life, August 16, 1705, in the 51st year of his age. He ordered a logarithmic spiral to be engraved on his tomb, with this motto, "Eadem mutata resurgo," I rise the same, though changed. He was married at the age of 30; and left one son and a daughter. By the exercise of extraordinary powers of invention, and persevering application, he made many valuable discoveries, which improved the method of analysis, the doctrine of infinite series, and the higher department of mathematical investigation; such as the quadrature of the parabola, and the geometry of curve lines, of spirals, cycloids and epicycloids. His works, with their respective titles, are enumerated in the General Dictionary, to which we refer; and they were collected and published in 2 vols. 4to. at Geneva, in 1744. The "Ars conjectandi," or the art of forming probable conjectures concerning events that depend on chance, in which he was engaged at the time of his death, and which is not included in the above collection, was printed at Basil in 1713, 4to. To this is added a treatise concerning infinite series. An extract from this valuable treatise, containing the best demonstration that has yet been given of sir Isaac Newton's famous binomial theorem, in the first and simplest case of it, or that of the integral and affirmative powers of the binomial quantity $a+b$, left by its great inventor without a demonstration, is included in the 3d volume of the "Scriptores Logarithmici," for which we are indebted to baron Maseres.

Bernouilli, John, the brother of the preceding, and no less celebrated as a mathematician, was born at Basil, July 27, 1667. At the age of 15, he commenced the study of philosophy, and soon after he was sent to Neufchatel to learn the French language, and the principles of commerce; but preferring intellectual pursuits to a mercantile profession, he returned home at the close of the year, for the prosecution of his studies, and received the degree of doctor in philosophy in 1685. Instructed by his elder brother in the first rudiments of mathematics, he afterwards, viz. in 1684, when he was only 17 years of age, concurred with him in investigating and explaining the principles of Leibnitz's differential calculus. He also was one of the three mathematicians, the two others being Huygens and Leibnitz, who solved the problem of the catenary curve, proposed by his brother James. In 1690, he set out on his travels; and in the progress of them communicated the discoveries of the new analysis to Daniel le Clerc, and Fatio de Duillier, at Geneva, and to the marquis de l'Hospital at Paris. On his return to his own country, in 1692, he commenced a correspondence with Leibnitz, which lasted during the life of the latter. Having declined the professorship of mathematics at Wolfenbuttle, which was offered him in 1693, he undertook, in 1695, a course of philosophical experiments at Groningen, and was furnished by the curators of the university with the necessary apparatus. About this time he discovered, what has been called the mercurial phosphorus, occasioned, as it is now known, by the friction of mercury against glass, in a partial vacuum; for which Frederic I. king of Prussia, honoured him with a gold medal, and with the rank of member of the academy of sciences at Berlin. He was also a member of the royal society of London, and of other learned bodies. He succeeded his brother James at Basil, in 1705, on which occasion he delivered a discourse, "De Fatis Novæ Analyseos, et Geometriæ Sublimis," and continued till his death in this situation, though he was solicited to remove to Leyden, Padua, and Groningen. He collected his works in 1743, and printed them at Lausanne, in 4 vols. 4to. His correspondence was extensive, and he was much engaged in a controversy with the English mathematicians concerning the invention of fluxions; in another with Renau, concerning the manœuvring of ships; and in another on mathematical subjects, with Jurin, Brook Taylor, Keil, Pemberton, Herman, and Riccati. In 1730, he gained a prize of the academy of sciences for a memoir on the elliptic figure of the planets, and the motion of their aphelia; and in 1734, he received the half prize, jointly with his son Daniel, from the same academy, for a memoir on the physical cause of the inclination of the planetary orbits. Bernouilli died January 1, 1748, in the 81st year of his age, and left four daughters and five sons, three of whom were mathematicians. Fontenelle's Eloges. Moreri.

Bernouilli, John, son of the preceding, was born at Basil, January 17, 1695, and died at Petersburgh, July 26, 1726. He was licentiate of law, professor of law at Berne; afterwards professor of mathematics at Petersburgh, and member of the institute of Bologna.

Bernouilli, Nicholas, nephew of the two preceding, professor of mathematics at Padua, afterwards of logic, and then of law at Basil, member of the academy of sciences and belles lettres at Berlin, and also of the royal society of London, and of the institute at Bologna, was born at Basil, October 10, 1687, and died there, November 29, 1759.

Bernouilli, Daniel, M.D. son of John Bernouilli, was born at Groningen, Feb. 9. 1700. Preferring mathematical to commercial pursuits, he passed the earlier part of his life in Italy, and at the age of 24, declined the presidency of an academy about to be established at Genoa, and in the following year accepted an invitation to Petersburgh, where he spent several years. On his return to Basil, in 1733, he was successively professor of anatomy and botany, and of natural and experimental philosophy; and had the honour of being a member of the academies of Petersburgh, Paris, and Berlin, and of the royal society of London. In 1724, he published his "Exercitationes Mathematicæ;" and, in 1738, his "Hydrodynamica." Many other pieces have been published in the memoirs of the academy of sciences at Paris, and in those of other societies. He gained and divided ten prizes from the Parisian academy; and on the division of the prize respecting the inclination of the planetary orbits, his father expressed dissatisfaction; more especially as Daniel had embraced the Newtonian philosophy in preference to that of Descartes, to which he himself maintained his attachment as long as he lived. In 1740, he divided the prize on the tides with Euler and Maclaurin. At Basil he was much respected, not only as a man of distinguished talents, but for his simple and modest manners. Although he paid external respect to the religion of his country, he was charged by his pastors with an excessive freedom of opinion, which

which he incautiouſly divulged. At the age of 80, he retained his mental powers in their full vigour; but from this time they began to decay. He died March 17, 1782. Nouv. Dict. Hiſt.

Bernouilli, John, L. L. D. brother of the preceding, was born at Baſil, May 18, 1710, and died there, July 17, 1790. He was profeſſor of eloquence, and afterwards of mathematics at Baſil, and member of the academies of Paris and Berlin.

Bernouilli, James, licentiate of law, member of the phyſical ſociety at Baſil, and correſpondent of the royal academy of ſciences at Turin, was the ſon of John Bernouilli laſt mentioned, and born at Baſil, October 17, 1759. His natural talents, for which he was diſtinguiſhed at an early period, were improved by long aſſiduous application. On his return from Neufchatel, whither he was ſent to ſtudy the French language, he was admitted to the degree of maſter of arts, and devoted himſelf to the ſtudy of the law. In 1780, he made the tour of ſeveral cantons of Swiſſerland, of which an account was publiſhed in the third volume of the collection of travels, publiſhed at Berlin by John Bernouilli. The ſtudy of the law, however, did not divert his hereditary inclination for the mathematics; and in theſe ſciences he made ſuch rapid progreſs, that in 1780, he was thought qualified to ſupply the place of his uncle, whoſe age and infirmities rendered him incapable of continuing his lectures on experimental philoſophy, though he did not ſucceed him in the vacant chair of profeſſor after his death. He had alſo experienced a ſimilar diſappointment in his views with regard to the chair of eloquence in 1780; on which occaſion he publiſhed his "Theſes on the Sublime." After theſe diſappointments, he determined to indulge his taſte for travelling, and accepted the office of ſecretary to count de Breuner, miniſter of the imperial court of Vienna to the republic of Venice. He ſtill retained his attachment to the mathematical ſciences, of which he exhibited proofs to the public in the memoirs of the royal academy of ſciences and belles lettres at Berlin, and in thoſe of the royal ſociety of Turin; and as he wiſhed to occupy a ſtation in which he might make uſe of the knowledge he had acquired, he was recommended by his countryman Mr. Fuſs to the princeſs of Daſhkof; and by her influence he was elected adjunct in the academy at Peterſburgh, with a ſalary of 600 rubles, and the promiſe of being promoted in the courſe of a year. Accordingly, he quitted Venice in 1786, and removed to Peterſburgh. Here he applied with unintermitting activity to phyſicial mathematics, and was ſoon honoured with the title of ordinary academician. In the interval of about 2 years, he preſented eight memoirs, which were inſerted in the ſix firſt volumes of the "Nova Acta Academiæ Scientiarum Imperialis Petropolitanæ;" which diſplay ſingular acuteneſs in analytical calculations. In 1788, he was appointed one of the profeſſors, who inſtruct the imperial corps of noble land cadets, and to the office of teaching algebra to the two firſt claſſes he devoted himſelf with great zeal and aſſiduity. In 1789, he married the youngeſt daughter of Mr. John Albert Euler; but being always of a weak and delicate conſtitution, he was ſeized with a fit of the apoplexy whilſt he was bathing, on the 3d of July in the ſame year, which ſpeedily terminated his life, in the 29th year of his age, very much to the regret of thoſe who knew and valued him on account of his ſcientific talents, and modeſt, amiable diſpoſition. Beſides a variety of mathematical and philoſophical pieces, which were publiſhed in the "Nova Acta, &c." "Rozier's Journal;" "Mem. de l'Acad. Royale, de Berlin, Ann. 1781;" "Mem. des Correſp. de l'Acad. Royale de Turin, Ann. 1784, 1785;" "Nova Acta Helvetica, tom. i." and "Leipſick Magaz, &c. Part 1, 1786;" and ſome diſtinct treatiſes; he alſo tranſlated "Merian's Philoſophical Memoirs," from the French into German, 2 vols. Nova Acta Acad. Scient. Imper. Petropol. vol. x.

BERNOVITZKOE, in *Geography*, a town of Ruſſia, in the government of Smolenſko; 40 miles north of Smolenſk.

BERNSTADT, a town of Sileſia, in the principality of Oels, on the river Weyda.

BERNSTEIN, a town of Germany, in the circle of Upper Saxony, and new mark of Brandenburg; 4 miles N. E. of Berlinchen.—Alſo, a town and caſtle of Germany, in the circle of Bavaria; 2 miles W. S. W. of Gravenau.

BERNSTORF, John Hartwig Ernest, Count Von, in *Biography*, an eminent ſtateſman, was born at Hanover, May 13, 1712, and poſſeſſed diſtinguiſhed talents, which were cultivated by ſtudy at the high ſchool of Tubingen, which he entered in 1727, and by travelling through various parts of Europe, under the learned Keyſler. Upon paying a viſit to Denmark, Bernſtorf was taken into the ſervice of Chriſtian VI. and employed in affairs of ſtate from the year 1732 till the year 1737. In 1742, he was envoy to the diet of that year, and to the court of the emperor Charles VII. and from the year 1744 to 1750, he was ambaſſador to France. In November 1736, he received the chamberlain's key; in June 1746, he was made a knight of the order of Dannebrog; and in October 1749, he was appointed a privy-counſellor. After his recal from France, in 1750, he formed an intimacy with the prince of Wales at Hanover, who wiſhed him to employ his talents in his ſervice; but by the death of the prince, in 1751, he was releaſed from his engagements; and upon this event he was immediately introduced into the privy-council, and entered on the office of miniſter for foreign affairs, and firſt ſecretary of the German chancery, and in 1752, was admitted into the order of the elephant. To Bernſtorf were owing the conduct and execution of thoſe beneficial meaſures which diſtinguiſhed the reign of Frederick V. Upon a plan ſuggeſted by him, was eſtabliſhed, in 1753, the hoſpital in Copenhagen, for the education of poor boys; and he was appointed preſident and governor of this patriotic and uſeful inſtitution, to which he gave a donation of 4000 rix-dollars.

In 1754, he adviſed the crown to purchaſe from the Eaſt-India company all their poſſeſſions, privileges, and merchandize; and by this act he promoted the proſperity of the Daniſh Weſt India iſlands, which had ſuffered from the excluſive right of the company. He alſo diſtinguiſhed himſelf by his activity and zeal in promoting the manufactures of the kingdom, which the king entruſted to his management in 1752, and he thus contributed to increaſe the population, and to excite a ſpirit of induſtry and emulation. He concurred in the deſigns that were formed for the abolition of ſlavery in Denmark, by the extinction of commons, and by freeing the farmers from the burthen of perſonal ſervice. He was alſo one of the firſt perſons in Denmark who counteracted the general prejudice againſt inoculation for the ſmall-pox, and who endeavoured to reconcile the people to the practice. Bernſtorf was likewiſe indefatigable in his exertions for promoting the inſtruction of the poor; and he projected a fund for the encouragement and recompence of meritorious, but poor, ſchoolmaſters; nor was he leſs ſolicitous to extend the benefits of education, ſo as to furniſh a ſupply of competent teachers, for which purpoſe he propoſed to eſtabliſh a ſeminary at Altona, in connection with the orphan-houſe of that city; but adverſe circumſtances prevented the completion of his deſign. He alſo diſtinguiſhed himſelf by the protection which he afforded to ſcience, and

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to men of letters. With this view, having been one of the first who discovered the beauties of the "Messiah," he invited the young author, Klopstock, who then resided in Switzerland, to Denmark, and for several years entertained him in his own house. By his influence, Oeder was appointed professor of botany; a botanical garden was established, and the professor was sent on a tour through the Danish provinces, the result of which was the "Flora Danica," published at the king's expence. Cramer, Mallet, Schleger, and Basedow, were also much indebted to his patronage. To Bernstorf Denmark owes the establishment of two useful societies; one, the society of the Danish language and fine arts, founded in 1760; and the other, the royal agricultural and economical society, established in 1769, of which the count himself was president. To him it was principally owing, that a society of learned men were sent, in 1761, to travel in Arabia and the east, at the king's expence, for the purpose of making useful discoveries. In consequence of the important services which he rendered, in various ways, to his sovereign and the state, he was created, in 1767, a Danish count; and he was the only minister who had the honour of attending the king, in 1768, on his tour to England. After their return, however, the count was [illegible] and the king, in acknowledgment of his past services, settled on him an annual pension of 6000 rix-dollars. On this occasion he found it necessary to leave a country to which he had devoted the service of 38 years of his life; and, accompanied by his countess and Mr. Klopstock, he repaired, in October 1771, to Hamburgh, where he spent the winter. Here he spent his time in social intercourse with his friends, but in the beginning of the year 1772, some rheumatic affections, under which he had laboured for several years, returned with an alarming violence, and terminated in a threatening fever. This fever was succeeded by a fit of apoplexy, which carried him off in a few minutes, on the 18th of February. His remains were interred, without pomp, agreeably to the instructions of his will, at the church of Siebeneichen, on one of his paternal estates. Two medals were afterwards struck in honour of him, by two societies of patriots. Bernstorf possessed a retentive memory, great penetration, and a sound judgment. Learned and accomplished himself, he was the liberal patron of literature and the arts. He was well acquainted with the Italian, French, and English languages; intimately conversant with the laws of nations in general, and attached to the rights of mankind; well informed in the ancient and modern history of different states; and not uninterested in the concerns of religion and the church. He corresponded with many learned men of different countries, and collected a valuable library of select books. His political measures were founded on truth and justice; in his transactions with foreign states he was upright and sincere; and he combined, with a vigilant attention to the privileges of the crown, a constant regard to the rights and liberty of the subject. Gen. Biog.

Bernstorf, Andrew Peter, Count Von, the nephew of the former, was born at Gartow in Luneburg, August 28, 1735, and at an early period acquired the knowledge of ancient and modern history, as well as of geography, mathematics, natural history, and the ancient languages. His studies were completed at Gottingen. Several of his juvenile years were spent in travelling through England, Switzerland, France, and Italy. Having occupied, after his return, some subordinate stations, he was made a member of the privy-council in 1769; but soon dismissed along with his uncle. Towards the end of the year 1772, after the fall of Struensee, he was recalled; and about the close of the following year he obtained the foreign department, and was at the same time appointed minister of state, and director of the German chancery; and he was employed in negotiating with Russia the exchange of the Gottorf part of Holstein for Oldenburg and Delmenhorst. In 1776, he was made a knight of the order of the elephant; and in 1780, during the American war, when an order was issued by the British government for intercepting all vessels belonging to neutral powers, laden with naval stores, and bound to any of the enemy's ports, he had an opportunity of exercising his diplomatic talents; and in a note submitted by him to the courts of the belligerent powers, the Baltic was declared a mare clausum; and it was further stated, that the king of Denmark had determined not to grant a passage through the Sound to armed ships belonging to the powers at war. It was also added, that the other northern powers had adopted and professed the same system. In a subsequent note, transmitted to the three belligerent powers, England, France, and Spain, Bernstorf expressed himself in the following terms: "An independent and neutral power never loses, by others being at war, the rights which it had before that war, since peace exists for it with all the belligerent powers without its having to receive or follow the laws of any of them. It is authorised to carry on trade, contraband excepted, in all places, where it would have a right to do so, if peace existed throughout all Europe, as it actually exists in regard to it." Soon after, Denmark and Russia entered into a treaty for the protection of their trade, to which Sweden, Prussia, and other states acceded; and the result was that league formed against Great Britain, known under the title of the "armed neutrality." Towards the end of the year 1780, Bernstorf resigned all his employments, and retired to his estates in Mecklenburg, where he resided till 1784, when he was recalled, and resumed his diplomatic functions: and to his exercise of these, Denmark owed the preservation of peace, when hostilities broke out between Sweden and Russia, in 1788. In 1791, Bernstorf interposed his mediation when the British ministry were preparing to assist the Turks against the Russians, to restore and promote tranquillity. In consequence of the French revolution, his Danish majesty was invited by the courts of Prussia and Vienna to join in the treaty which had been concluded between them. To this proposal Bernstorf replied, in 1792, with considerable address; and in 1793, when his Britannic majesty's envoy extraordinary at Copenhagen presented a note to that court, in consequence of the plan concerted by the allied powers for blockading the ports of France, Bernstorf returned an answer, which was alluded to by the marquis of Lansdown in the house of lords, February 17, 1794, in the following terms: "The reply of count Bernstorf to our remonstrances, was one of the boldest, wisest, and most honourable replies I have ever read. It is a state paper, which should be kept as a model by every cabinet of Europe." The conduct of Bernstorf was highly satisfactory to his fellow-citizens; various institutions were distinguished by his name; and medals were struck to perpetuate the remembrance of his services. At length, he fell a victim to the gout, to which he had been subject for many years, and which baffled all remedies, on the 21st of July, 1797; and his remains were interred with great pomp, and amidst numerous attendants, who lamented the loss of him, in Frederic's church at Christianslaven.

His figure was agreeable, and his manners were engaging, his disposition lively, and his eloquence natural. In business he was active and indefatigable; in conversation communicative and concise; averse from flattery, and yet respectful in his behaviour; sparing of professions and promises, and

 punctual

punctual in performing them; prudent in his plans, and firm and zealous in executing them. His memory was tenacious, his benevolence extenſive, his reverence of the Deity unfeigned, and his attachment to the Chriſtian religion unwavering. Gen. Biog.

BERNUS, in *Geography*, a mountain of European Turkey in Macedonia; 10 miles S.E. of Saloniki.

BERNY, a town of France, two leagues ſouth of Paris.

BEROALDO, Philip, the *Elder*, in *Biography*, was born at Bologna in 1453, and at the age of 19, became profeſſor of the belles lettres in his native city. He alſo read lectures at Parma, Milan, and Paris, and at the latter place, or, as ſome ſuppoſe, Perugia, he held a public ſchool of eloquence. But, recalled by his countrymen, he renewed his ſcholaſtic labours at Bologna with ſuch reputation, that he had 600 hearers at a time. To the ſtudy of polite literature, he added thoſe of philoſophy, medicine, and juriſprudence; and he alſo engaged in public employments aſſigned to him by his country. His diſpoſition was convivial, and his conduct not exempt from the charge of licentiouſneſs, before his marriage in 1498. By his good humour he eſcaped or conciliated literary conteſts, and maintained an uninterrupted intercourſe with the greateſt number of learned perſons of the age in which he lived. He died in 1505. His commentaries and notes extended to all the Latin writers of eminence; and are more diſtinguiſheed by their erudition, than their elegant taſte and ſound criticiſm. With the more obſcure authors of antiquity he was particularly converſant, and he took pleaſure in reviving the uſe of words that were barbarous or obſolete. Beſides his commentary on the "Golden Aſs of Apuleius," printed in 1501, and affording a ſpecimen of his manner, he publiſhed a great number of his own orations, letters, poems, and other works, of which a collection was printed at Baſil in 1513. Moſt of his obſervations on authors are contained in Gruter's Theſaurus Criticus. Moreri. Gen. Biog.

Beroaldo, Philip, the *Younger*, nephew of the former, was a native of Bologna, and profeſſor of belles lettres in the univerſity of that city, and afterwards at the Sapienza in Rome. In 1516, he was appointed librarian of the Vatican by Leo X., but about two years after, before he took regular poſſeſſion of the office, with its emoluments, he died at the age of about 40 years. His Latin poems, by which he acquired great reputation, are publiſhed with thoſe of his uncle, to which they are prefixed, in the firſt volume of the "Deliciæ Poetarum Italorum." A collection of his elegies and epigrams, in 3 books, was publiſhed at Rome in 1530. His Latin verſion of an oration of Iſocrates, and notes on the firſt five books of the Annals of Tacitus, were publiſhed by order of Leo X. Nouv. Dict. Hiſt.

BEROE, in *Entomology*, the name aſſigned by Cramer, to the ſpecies of Papilio *Europa* of Fabricius and Gmelin.

Beroe, in *Natural Hiſtory*, the name of a ſpecies, Medusa (*Pileus*) in Act. Helv. Beroë with an octagonal body, and very long tentacula, Gronovius.—Beroë is alſo the name under which *meduſa infundibulum* (Müll. and Fabr.) is figured and deſcribed in Brown's Hiſt. Jam.—Linnæus, in the tenth edition of his "Syſtema Naturæ," calls it *meduſa beroë*, and in the twelfth, *volvox* (Beroë) *ovatus, angulis ciliatis novem*.

Beroe, in *Mythology*, one of the nymphs, who, according to Virgil, was companion to Cyrene, the mother of Ariſtæus. Beroë was alſo the name of the nurſe of Semele.

BERŒA, Berrhœa, or Beræa, in *Ancient Geography*, *Cera-veria*, a large and populous city of Macedonia, ſouth-weſt of Ægæ or Edeſſa, north-weſt of Pella, and eaſt of Cyrrhus, at the foot of mount Bermius. Under the Greek Chriſtian empires, it became the ſee of a biſhop. This was the city to which Paul and Silas fled from Theſſalonica, where they found a ſynagogue of Jews and proſelytes, who are commended for their unprejudiced and impartial inveſtigation of divine truth, and where, in conſequence of this diſpoſition, they gained many converts to Chriſtianity. Acts, xvii. The medals of this city are bronze, gold, and ſilver. —Alſo, a town of Syria, between Antioch and Hierapolis, which ſome have ſuppoſed to be the modern Aleppo, anciently called Chalep. (See Aleppo.) In the collection of Dr. Hunter, there was a bronze medal of this city, with a legend and a dolphin twiſted about a trident. At this city there were ſtruck Imperial Greek medals in honour of Trajan, Antoninus, and Adrian.

BEROLHEIM, in *Geography*, a town of Germany, in the circle of Franconia, and principality of Anſpach, ſeated on the Altmuhl, with 2 churches, 5 miles weſt of Weiſſenburg.

BEROLINENSIS, in *Entomology*, a ſpecies of Cantharis, of a black colour: baſe of the antennæ, and wing-caſes yellowiſh; tip of the laſt black; legs ferruginous. Herbſt.

Berolinensis, a ſpecies of Curculio that inhabits Europe. It is whitiſh, varied beneath; thorax rugoſe, black, ſides variegated; on the wing-caſes, two undulated black bands. Herbſt.

Berolinensis, a ſpecies of Cryptocephalus, (*Crioceris*) found in the vicinity of Berlin. The head and thorax are ſcarlet and gloſſy; wing-caſes granulated, black; eyes of the ſame colour; legs fulvous. Herbſt.

BEROSUS, in *Biography*, a famous ancient hiſtorian, was a native of Babylon, and prieſt of the temple of Belus, and flouriſhed about the time of Alexander. Tatian informs us, that he dedicated his work to Antiochus Theos, the third king after Alexander. While the Macedonians were maſters of Babylon, he learned of them the Greek language, and paſſing from Babylon to Greece, ſettled in the iſland of Cos, and there opened a ſchool, in which he taught aſtronomy, and aſtrology. From Cos he removed to Athens, where he acquired ſuch reputation by his aſtrological predictions, that the Athenians erected to him a ſtatue in their gymnaſium, with a golden tongue. (Vitruvius, lib. ix. c. 7.) The ancients cite three books of his hiſtory of the Chaldæans of Babylon, of which Joſephus, Alexander Polyhiſtor, and Euſebius, have preſerved ſome fragments, that are uſeful in forming the ſeries of Babylonian kings. Joſephus ſays, that he agreed with Moſes in his accounts of the deluge, the fall of man, and the ark, in which the reſtorer of mankind was ſaved: and adds, that he mentions the deſcendants of Noah and their reſpective ages, to Nabulaſſer, king of Babylon; and that, relating the actions of that prince, he ſpeaks of the taking and burning of Jeruſalem by his ſon Nebuchadonoſor, on which occaſion, ſays he, the Jews were carried captives to Babylon, whence enſued the deſolation of that city for 70 years, till the time of Cyrus. He is quoted by Pliny, Tatian, Clement of Alexandria, Tertullian, Vitruvius, and Euſebius; whence we may infer, that he was eſteemed a writer of authority. In the ſeries he gives us of the ten kings, whom he ſuppoſes to have reigned at Babylon before the flood, there are ſome ſmall variations in the authors who have tranſcribed that hiſtorian. Theſe ten ſucceſſions exactly anſwer to the ten generations from the creation to the flood: the firſt king, by name Olorus or Alones, has been ſuppoſed by ſome to be the ſame with Adam, by others Nimrod, as Xiſuthrus, the laſt in the ſeries, plainly appears to be Noah. Pliny (H. N. l. vi. c. 55. l. vii. c. 31 and 37.) informs us, that his book contained the aſtronomical obſervations of 480 years, commencing from the

æra of Nabonassar. Annius, a monk of Viterbo, published a work under the name of this historian, full of fables, which obtained some credit among the learned, but was soon recognized to be a forgery. Berosus is said to have had a daughter who uttered predictions like himself, and became the Cumæan sibyl. Brucker's Hist. Phil. by Enfield, vol. i. p. 34. Bryant's Analysis, vol. iii. p. 25, &c. Fabricius, Bib. Græc. vol. xiv. p. 175.

Berosus, in *Ancient Geography*, a mountain of the Tauric Chersonesus, south of mount Trapezus. This chain of mountains comprehends, according to M. Peyssonnel, the mountains now called "Tehadir-dagi," the highest of the whole peninsula, and those of "Balyklava," and "Cabarta."

BEROTH. See Beeroth.

BEROTHA, or Beroth, a city situated on the northern frontiers of Palestine; supposed to be the same with "Berothai," one of the cities of Hadadezer, which David took, and in which he found much brass. (2 Sam. viii. 8.) According to some, this was Beroe of Syria, according to others, Berytus of Phenicia, or the same that is mentioned by Ezekiel (ch. xlvii. 16.) between Hethalon and Emesa.

BERQUET, in *Commerce*, a weight of 173 pounds, by which hemp and other goods are sold in Russia.

BERQUIN, Louis de, in *Biography*, was born in Artois about 1490, and was much esteemed at the court of France, where he obtained the title of king's counsellor. Although he does not appear to have left the Catholic church, or joined the Lutherans, he followed the example of Erasmus, in declaiming against the ignorance and superstition of the clergy. Having incurred the charge of heresy by his publications, which were chiefly books of Erasmus, and extracts from his works and those of others, with his own notes, he was twice prosecuted; but in the first instance acquitted, and in the second condemned, unless he retracted his errors, and gave satisfaction, to be burnt. His spirit was resolute, and he demurred against submission; his judges, however, desirous of saving him, deferred the execution of the sentence; and upon the return of Francis I. from Spain, he was set at liberty. But Berquin, though dissuaded from it by Erasmus, publicly accused his enemies, Noel, Beda, and others, of irreligion; and upon a third prosecution, he was sentenced to make a public recantation, and to suffer perpetual imprisonment. Refusing to acquiesce in this sentence, because it implied an acknowledgment on his part, that his sentiments were erroneous, he was condemned as an obstinate heretic, and accordingly strangled on the Greve, a public place near the Seine, appropriated to bonfires and the execution of criminals, and afterwards burnt. He suffered death with great constancy in April 1529; and though the monk who attended him intimated that he discovered some signs of abjuration at the stake, Erasmus ascribes the suggestion to the fraud and falsehood usually practised on such occasions. Berquin was a person of great abilities, invincible fortitude, and irreproachable character. Gen. Dict. Jortin's Life of Erasmus, vol. ii. p. 476—478.

BERRA. See Beria.

BERRE, in *Geography*, a town of France, in the department of the mouths of the Rhone, and chief place of a canton, in the district of Aix, situated at the mouth of a river, running into the lake of Martigues, called "the lake of Berre," in an unhealthy climate. It was formerly one of the strongest towns of Provence. It was taken after a long siege, in 1591, by Charles Emanuel, duke of Savoy, during the wars of the league; and when the rest of the province submitted to Henry IV., he could not drive the Savoyards from Berre, till it was given up in 1596, in consequence of the peace of Vervais; 4½ leagues S. W. of Aix. The population of the town is estimated at 1800, and of the canton at 6769 persons. The territory comprehends 257¼ kiliometres, and six communes.

BERREA, in *Ancient Geography*, *Bra*, a town of Bulgaria, 10 or 12 leagues from Philippopolis, upon the river Braesa.

BERRETINI, Peter, commonly called *Pietro da Cortona*, in *Biography*, an eminent painter of history and landscape, was born at Cortona, in Tuscany, in 1596; and acquired the first rudiments of his art under Andrea Commodi, and Baccio Ciarpi. At Rome, whither he went in his youth, he studied the antiques, in the works of Raphael, Buonaroti, and Polidoro, with such diligence, that he attained to great excellence as an artist. At this early period, he was patronized and employed by the marquis Sacchetti; and in his palace, he painted the "rape of the Sabines," and the "battle of Alexander," which were much admired for invention, disposition, elevation of thought, and an excellent tone of colour, and deemed to be equal to the performances of the best masters. His fame was completely established at Rome, by the saloon of the Barberini palace, and by several works in the Vatican, and in some of the principal churches of the city. For further improvement, he travelled through Lombardy and Venice; and returning by way of Florence, he was employed by the grand duke Ferdinand II. in decorating some rooms in the Pitti palace, with pictures of virtuous and heroic actions from ancient history. At Rome, where he afterwards resided, he adorned the gallery of the palace of Innocent X. on the piazza Navona, with various subjects from the Æneid: and as an architect, in which profession he excelled, he gave designs for a number of churches, palaces, chapels, and monuments. To the church of St. Martina, which was of his own construction, he left a large sum for the erection of a grand altar-piece of bronze, and of his own mausoleum. Pope Alexander VII. was so well satisfied with the portico he built for the church of Peace, that he made him a knight of the golden spur, and gave him a rich cross, appendant to a gold chain. In his more affluent and more humble condition, Berretini displayed the same equanimity, and uniformly maintained a respectable character. The gout, to which he was subject, disabled him, towards the close of life, from undertaking any great works, and at length confined him to his bed. He died at Rome in 1669. "As an artist, his character was richness of invention, with grace, beauty, and facility of execution. His dispositions are fine, his management of lights good, and his ornaments and back-grounds charming; but his drawing is incorrect, his figures defective in expression, and too much alike. His fresco paintings were uncommonly brilliant and clear. He succeeded better in great compositions than in small. An Italian writer has said of him, that "he had fire in his colours, vehemence in his hands, and fury in his pencil." Besides his capital works in the palazzo Sacchetti, the Barberini palace, and the palazzo Pitti at Florence, there is, in the palace of the king of Sardinia at Turin, a small sketch representing the "Annunciation of the Virgin," which is touched with exquisite skill and spirit, and in the palace of the prince della Torre, at Naples, there is an incomparable picture of the "Flight into Egypt." The design is correct; the heads are wonderfully graceful; the composition is extremely fine, and the colouring is excellent. Many of his works have been engraved by the best artists. D'Argenville Vies des Peintres. Pilkington.

BERRETONI, Nicolo, an historical painter, was born at Macerata in 1617, and under Carlo Maratti, whose disciple he was, he studied design and colouring for some years, and became so distinguished as a painter, that he excited the

jealouſy and envy even of his maſter. His early works, after he quitted the ſchool of Maratti, were in the ſtyle and taſte of Guido; a circumſtance which, of itſelf, highly recommends them. He died in 1682. Pilkington.

BERRHŒA, in *Ancient Geography*. See Beroea.

Berrhoea, a town of Thrace, between Nicopolis of Mœſia, and Philippopolis of Thrace. Ammianus Marcellinus ſpeaks of it as a large city.

BERRIMAN, William, in *Biography*, a learned Engliſh divine, was born in London in 1688, and from Merchant Taylors' ſchool was removed, at the age of 18, to Oriel college, Oxford, where he proſecuted his ſtudies with great aſſiduity and ſucceſs. With a view to the critical examination of the Scriptures, he combined with ſkill, in the Greek tongue, the ſtudy of the Hebrew, together with the Chaldee, Syriac, and Arabic; and in explaining the ſacred writings, he had recourſe to the rules of grammar, criticiſm, logic, and the analogy of faith. The articles of doctrine and diſcipline, which he deduced from the ſcriptures, he traced through the primitive church, and confirmed by the evidence of the fathers, and the deciſions of the more generally received councils. After he left the univerſity, where he was graduated M.A. in 1711, he ſerved two churches in London. His firſt appearance in print, was on occaſion of the Trinitarian controverſy, in 1719, when he publiſhed "A ſeaſonable Review of Mr. Whiſton's Account of Primitive Doxologies," which was followed in the ſame year by "A ſecond Review." Theſe performances recommended him to the patronage of Dr. Robinſon, biſhop of London, who, beſides conferring upon him a living in the city, and appointing him his chaplain, left him at his death the fifth part of his large and valuable library. In 1722, he accumulated, at Oxford, the degrees of bachelor and doctor in divinity. In the years 1723 and 1724, he was appointed to preach lady Moyer's lecture in defence of the commonly received doctrine of the Trinity, and his eight ſermons, delivered on this occaſion, were publiſhed, in 1725, under the title of "An Hiſtorical Account of the Trinitarian Controverſy." In conſequence of this ſervice, he was elected, in 1727, a fellow of Eton college. His "Hiſtorical Account" contained ſome obſervations relating to miracles, and drew upon him the animadverſions of Dr. Conyers Middleton; in anſwer to which, he publiſhed, in 1731, "A Defence of ſome paſſages in the Hiſtorical Account." By his "Brief Remarks on Mr. Chandler's Introduction to the Hiſtory of the Inquiſition," printed in 1733, and followed by a "Review of the Remarks," he incurred the charge of favouring the principles of intolerance, and in this controverſy he incurred the ſevere ſtrictures of that acute and learned nonconformiſt. His next publication was his courſe of ſermons at Boyle's lecture, preached in the years 1730, 1731, and 1732, and given to the world in 2 vols. 8vo. in 1733. In this work he ſtates the evidence of our religion from the O. T.; vindicates the Chriſtian interpretation of the ancient prophecies; and points out the hiſtorical chain and connection of theſe prophecies. In the preface, he aſſerts the authority of Moſes, as an inſpired hiſtorian and lawgiver. Beſides the writings already enumerated, Dr. Berriman printed a number of occaſional ſermons. He departed this life at his houſe in London, on the 5th of February 1749—50, in the 62d year of his age, and in his funeral ſermon, preached by Mr. Ridley, a great character is given of him, both as a miniſter of his pariſh, and as a private Chriſtian. His piety was unaffected and ſincere; and his benevolence extenſive. In the year of his deceaſe, two volumes of his ſermons were publiſhed in 8vo., under the title of "Chriſtian Doctrines and Duties explained and recommended;" and in 1763, 19 ſermons appeared in one volume, under the ſame title. "With reſpect to Dr. Berriman's practical diſcourſes, it is allowed that they are grave, weighty, and uſeful, and well fitted to promote pious and virtuous diſpoſitions; but when he treats on the power, rights, and dignity of the prieſthood, or on doctrines which have been greatly diſputed, different opinions will be formed, according to the different ſentiments of his readers." Biog. Brit.

BERRINGEN, in *Geography*, a town of France, in the department of the Lower Meuſe, and chief place of a canton, in the diſtrict of Haſſelt. The place contains 646, and the canton 10,360 inhabitants: the territory includes 232½ kiliometres and 9 communes.

BERRY, *Bacca*, a grain, fruit, or ſeed, produced by ſeveral herbs, trees, and ſhrubs, thence called "bacciferous," for the conſervation and reproduction of their kind. Some define berries as a fruit ſmaller than apples, growing in bunches, but not ſo thick or cloſe as grapes. Others, a ſoft, fleſhy, ſucculent fruit, having ſtones or kernels within them. Such are the fruits of laurels, olives, currants, and the like. The berry, or bacca, in a ſtrict ſenſe, denotes a pulpy pericardium without valves, in which the ſeeds are naked. See Bacca.

Berries are of various ſizes, forms, properties, and uſes, according to the plants whereon they grow.—Some are uſed in medicine, as juniper-berries, buckthorn-berries, &c. Others in dyeing, as French or yellow berries, &c. The yellow berry-waſh may be thus prepared: take a pound of the French berries, and put them to a gallon of water, with half an ounce of alum; boil them an hour in a pewter veſſel, and filter off the fluid; put them again into the boiler, and evaporate the fluid till the colour appear of the required ſtrength.

Berry-*Bearing Alder*. See Rhamnus Frangula.

Berry, *Avignon*. See Avignon.

Berry, *Ale*. See Ale.

Berry, in *Geography*, a province of France, before the revolution, now comprehended under the departments of Indre and Cher, of which Bourges was the capital; bounded on the north by Orleannois, on the ſouth by Bourbonnois and Marche, on the eaſt by Nivernois, and on the weſt by Poitou. Berry was divided into the Upper and the Lower, and extended about 90 miles from north to ſouth, and 73 from eaſt to weſt; it is watered by ſeveral rivers, as the Loire, Creuſe, Cher, Indre, &c. enjoys a temperate air; is fertile in corn, fruit, wine, hemp, flax, and paſturage; and contains ſeveral ſtone quarries, and ſome mines of ſilver, iron, and ochre. Beſides the trade in wine, carried on at Bourges, the principal commerce of this province conſiſts in fat cattle ſent to Paris, and the great number of ſheep, which produce fine wool, manufactured in this and other parts of the kingdom. In Berry there are two kinds of manufactures; one for cloths and ſerges, and the other for knit and wove ſtockings.

Berry *Haven*, lies about a mile ſouth of the entrance into Donnegal haven, on the weſt coaſt of Ireland, and 5 miles N. N. E. from the haven of Ballyſhannon.

Berry *Head*, a noted promontory on the ſouth coaſt of Devon, being the ſouth-weſt limit of Torbay, and running far out ſouth into the ſea. Off this head, out of the way of the entrance into the bay, is a rock, called Berry-rock.

Berry's *Iſlands*, a ſmall cluſter of iſlands on the north-weſt point of the great Bahama bank, in the channel of Providence. N. lat. 25° 30′. W. long. 75° 40′.

BERSABA, in *Ancient Geography*. See Beer-Sheba.

BERSABORA, a large, ſtrong, and populous town of Perſia.

BERSARII, in *Writers of the Middle Age*, a kind of hunters, or ſportſmen, who purſued wild beaſts in foreſts and chaſes. The word ſeems derived from the barbarous Latin *berſare*,

berfare, "to shoot with a bow." On which principle it should properly denote archers only, or bowmen. Or it might be derived from *berfa*, the "fence or pales of a park." In which view it should primarily import those who hunt or poach in parks or forests.

Hincmar speaks of a kind of inferior officers in the court of Charlemagne, under the denomination of *berfarii*, *veltrarii*, and *beverarii*. Spelman takes the first to denote those who hunted the wolf; the second, those who had the superintendency of the hounds for that use; and the third, those who hunted the beaver.

BERSCHETZ, or BERSCHESZH, in *Geography*, a little town of Carniola, seated on a high rock near the Adriatic sea, and containing a small harbour. In this place is produced a thick and sweet wine, of a black red colour.

BERSELLO, or BRISELLO, a town of Italy, in the duchy of Modena, seated on the Po. It was taken by the imperial troops under prince Eugene in 1702, and by the French under the duke of Vendome in the following year. The emperor Otho died here, after his defeat by the army of Vitellius. The town is small, but fortified; 27 miles north-west of Modena. N. lat. 44° 55'. E. long. 10° 30'.

BERSHEK, a mountain of Persia, on the north-west side of the lake of Zurra, noted for a fire-temple, the resort of the Guebres.

BERSIMA, in *Ancient Geography*, a town of Asia, in Mesopotamia, seated on the left bank of the Euphrates, south-west of Nicephorium.

BERSKOI, in *Geography*, a town of Siberia, 20 miles north-east of Kolivan.

BERSTADT, a small town of Moravia, in the circle of Olmutz.

BERT. See BRIT.

BERTAUT, JOHN, in *Biography*, an early French poet of reputation, was born either at Caen, or at Condé, in Perche, in 1552; and being known at court by his wit, was appointed first almoner to Catherine de Medicis, private secretary and reader to Henry III. and was much esteemed by Henry IV. in whose conversion he was eminently instrumental. In 1594, he was made abbot of Aulnai, and, in 1606, bishop of Seez. After his advancement to this see, his conduct was irreproachable, though some blame attached to him, because, instead of suppressing the free poems of his youth, he published them with the pious pieces of his advanced age. He died in 1611. As a poet, he is stated to have been more natural and clear than Ronsard, more forcible than Desportes, and more ingenious and polished than either of his contemporaries. Some of his stanzas are said to possess the ease and elegance of a more refined period. His fondness for point, with which his pieces abound, he seems to have derived from his attachment to Seneca. His "Poetic Works" were printed in 1620, Paris, 8vo. He left also a translation of some books of St. Ambrose, controversial tracts, sermons, and a funeral oration for Henry IV. Nouv. Dict. Hist. Gen. Biog.

BERTH, in *Sea Language*. See BIRTH.

BERTHEAU, CHARLES, in *Biography*, an eminent French protestant divine, was born at Montpelier, in 1660, and after having studied philosophy and divinity, partly in France, and partly in Holland, was admitted a minister in the synod of Vigan in 1681. His first settlement was as pastor to the church at Montpelier, whence he removed to be minister of the church at Paris, which met at Charenton. Upon the revocation of the edict of Nantes, he came over to England, and in 1686, was chosen one of the ministers of the Walloon church in Threadneedle-street, London, in which capacity he officiated, with very general applause, for 44 years. He died, much regretted, in December 1733. He was distinguished by sound judgment, by a retentive memory, so that he is said never to have forgotten any thing which he had seen, read, or heard, by his accurate and extensive acquaintance with ecclesiastical history, and by his eloquence as a preacher. Two volumes of his sermons have been printed in French; the first in 1712, and the second at Amsterdam, where the former was reprinted, 1730. Gen. Dict.

BERTHEAUME POINT, in *Geography*, the west limit of the bay so called about 1½ league east from St. Matthew's point, without the entrance into the road of Brest. Within the point, on the west side of the bay, are the castle and rock of Bertheaume.

BERTHEVIN, ST., a town of France, in the department of the Mayenne, and chief place of a canton, in the district of Laval, ⅔ of a league west of Laval.

BERTHING, in the *Sea Language*, denotes the raising or bringing up of ship-sides. Thus they say, a clinker hath her sides berthed up before any beam is put into her.

BERTHOLZ, in *Geography*, a town of Germany, in the archduchy of Austria, 5 miles W. N. W. of Zwelt.

BERTHONCELLES, a town of France, in the department of the Orne, and chief place of a canton, in the district of Bellesme, 13 miles north-east of Bellesme.

BERTI, JOHN-LAURENCE, in *Biography*, an Augustin monk, was born in 1696 at Seravezza, a village in Tuscany, and upon being called to Rome by his superiors, was appointed assistant general of his order in Italy, and prefect of the angelic library. In a great work, entitled "De Disciplinis Theologicis," printed at Rome, in 8 vols. 4to. he appears to have adopted the sentiments of St. Augustin, which involved him in a controversy with the Jesuits, and caused him to be denounced to pope Benedict XIV. as a disciple of Baius and Jansenius. Against this charge he defended himself in a learned apology, comprehending 2 vols. 4to. He afterwards composed in Latin an "Ecclesiastical History," in 7 vols. 4to., which was afterwards abridged in one volume, 8vo. In this work he represents the pope as supreme monarch and arbiter of all kingdoms and empires. He also wrote many other works, some of which are Italian poems, all of which were published together at Venice in folio. He was invited by Francis I. grand-duke of Tuscany, to Pisa, and received a considerable pension, with a professorship in the university, under the title of "Imperial theologist," and here he died, in 1766, much lamented by his colleagues. Nouv. Dict. Hist.

BERTIE, in *Geography*, a maritime county of America, in North Carolina, and Edenton district, having for its south boundary the Roanoke, and on the east Albemarle sound. In this county is situated the ancient Indian tower of Tuscarora. It contains 12,626 persons, of whom 5141 are slaves.

BERTIERA, in *Botany*, derives its name from M. Bertier of France, and was so called in honour of him, by M. Aublet. Lin. gen. Schreb. n. 304. Aubl. 69. Juss. 200. Class and order, *pentandria monogynia*. Nat. Ord. *Contortæ*, Lin. *Rubiaceæ*, Juss. Gen. Char. *Calyx*, perianth turbinate, five-toothed. *Cor.* one petalled; tube short; mouth villose; border five-cleft; clefts ovate, acute, spreading. *Stam.* filaments five, very short, inserted into the tube beneath the orifice; anthers linear, erect. *Pist.* germ roundish, inferior, crowned by a gland; style filiform; stigma two-plaited. *Per.* berry globose, crowned by the teeth of the calyx two-celled. *Seeds* very many, roundish, affixed to the dissepiment.

Ess. Char. *Cal.* turbinate, five-toothed. *Cor.* tube short, with a villose mouth; *berry* globose, inferior, two-celled, many-seeded.

Species,

Species, 1. B. *guianensis*. Aublet. Guian. 180. t. 69. This is a shrub six or seven feet high, and the thickness of the human arm; branches opposite, knotty, tomentose; leaves opposite, ovate, acuminate, and tomentose underneath; petioles short, convex beneath, channelled above; stipules stem-clasping, two-lobed; flowers in terminating racemes; corolla white. Found by Aublet in the wood of Aroura, in Guiana, flowering and fruiting in the month of June. Martyn.

BERTIN, Nicholas, in *Biography*, an historical painter, was born at Paris in 1667; and after studying under some of the principal artists, and gaining, at the age of 18 years, the prize of merit in the academy, was sent to Rome for further improvement, where he acquired a good taste for composition, and in Lombardy he completed his knowledge of colouring. Some time after his return to Paris, he was made academician in 1703, and professor in 1705. His drawing was correct; his invention ready in all sorts of subjects; and he painted in a strong, pleasing, and finished style. He was much employed by Louis XIV.; and his performances were valued and sought after by foreigners. He excelled more in small works than great ones; and from this circumstance, and some others, he was referred only to the second rank of artists. Among his most considerable performances we may reckon the ceiling at the chateau of Plessis St. Pierre, the subject of which was the adoration of the Magi, and an historical composition, representing the baptism of the eunuch of the queen of Candace, by St. Philip. He temper was reserved, and he was much addicted to religion. He died at Paris in 1736. Pilkington. Gen. Biog.

BERTIN, Joseph, Exupere, was born at Tremblay, in the department of Rennes, June 28th, 1712. Having gone through the usual course of study, in anatomy, physiology, and theraupeutics, he was created doctor in medicine at Paris, in 1740. The following year he published "Non datur imaginationis maternæ in fœtum actio," combating an opinion, which had long prevailed, that the imagination of the mother had the power of marking and disfiguring the fœtus in utero. His next production, which is much commended by Haller, is a treatise on "Osteology," in 4 vols. 12mo. The bones of the head are described more exactly and minutely, Haller says, than in any other work extant. About the same time, he had a long, but not very interesting dispute, with Mons. Ferrein, on the formation of the voice. In the year 1764, he joined Messrs. Le Bas, Petit, and others, in defending the cause of Madame Renné, who had been delivered of a male child ten months and twenty days after the decease of her husband, and who wished to get the child acknowledged as his. Bertin, with his coadjutors, endeavoured to establish as a principle, that there is no fixed term for the birth of the child, and that, according as the constitution of the parents was more or less vigorous, a greater or less portion of time might be required for the perfection of the fœtus. A child might be ripe, and fit for the birth, they maintained, at the end of the seventh month, if the parties enjoyed great strength of constitution; or in an opposite state of them, it might require ten, eleven, twelve, or more months, to fit it for exclusion. This doctrine was attempted to be established by recurring to a great number of cases and observations, and to the decisions of the courts, of which they produced several, legitimate children, supposed to have been born in the eleventh or twelfth month after conception. Recourse was also had to the histories of monstrous births, to shew the aberrations of nature. These arguments and cases were ably and judiciously opposed by M. Louis. The cases adduced by his antagonists were shewn to be defective in evidence, and though he admitted that the time of gestation in women, as well as in animals, might be protracted for a few days, yet he much doubted whether, in any instance, it had been extended to the end of the tenth month, or at the most to more than two or three days beyond that term. In support of this opinion, he cited the authority of some of the ablest philosophers, physicians, and lawyers; and the court, according to this determination, declared the child to be illegitimate. Though the court in this decision were probably influenced by the peculiar circumstances of the case, the husband being 76 years of age at the time of his death, and for the last month in such a state as to be incapable of performing the conjugal rites, yet the arguments and authorities adduced by M. Louis, must have had great weight with them, and well deserve to be had recourse to in deciding on general principles, what is the utmost term to which a woman may carry a living child. M. Bertin was author of several dissertations, principally on anatomical subjects, which were published in the Memoirs of the Royal Academy of Sciences, and other philosophical and medical journals and transactions; the titles and accounts of which are given by Haller, in his Bib. Anatom.

BERTINCOURT, in *Geography*, a town of France, in the department of the Straits of Calais, and chief place of a canton, in the district of Arras. The place contains 1275, and the canton 13,035 inhabitants: the territory includes 112½ kiliometres and 17 communes.

BERTINORO, a town of Italy, in the state of the church, the see of a bishop, suffragan of Ravenna; seated on a hill, and defended by a citadel, 15 miles south of Ravenna.

BERTIUS, Peter, in *Biography*, an eminent geographer, was born at Berveren, a village in Flanders, in 1565, and acquired the knowledge of the learned languages in England. Having travelled through Germany, and other countries, he settled at Leyden, where he became professor of philosophy; but after occupying this post for 26 years, he was expelled for joining the Arminian party. Upon his expulsion he migrated to Paris, where he abjured the protestant religion in 1620, and was made cosmographer to the king, and professor-royal extraordinary of mathematics. He died in 1629. His principal works are "Theatrum Geographiæ Veteris," Amst. 2 vols. fol. 1618, 1619; which is a collection of the works of almost all the ancient geographers, illustrated by notes, and esteemed a valuable publication; "Introductio in universam Geographiam;" "Comment. Rerum Germanic. lib. iii." Amst. 12mo. 1635, containing a good description of Germany, and a map of the empire of Charlemagne; "Notitia Episcopatuum Galliæ," Par. fol. 1625; "De Aggeribus et Pontibus," Par. 8vo. 1629. The works above enumerated are held in high estimation by geographers. We may add "Illustr. Virorum. Epist. select. superiori sæculo script. vel a Belgis vel ad Belgas," 8vo. 1617. Bertius also wrote several pieces in the controversy between the Gomarists and Arminians, and published discourses on various occasions. Nouv. Dict. Hist.

BERTON Road, in *Geography*, lies within Dalkey island, at the south point of the entrance into Dublin bay, Ireland.

BERTONA, Bertonia, Berthona, Barton, or Berton, properly denotes that part of a country farm where the barns and other inferior offices stand, and wherein the cattle are foddered, and other business is managed. *Berton* is also used to signify a farm, as distinct from a manor. Du-Cange. In some parts of the west of England, they call a great farm a *berton*, and a small one a *living*. Hence also *bertonarii* was anciently used for those we now call farmers, or tenants of bertons.

BERTON-

BERTONCOURT, in *Geography*, a town of France, in the department of the Moselle, and chief place of a canton, in the diſtrict of Bouray, 10 miles north-eaſt of Metz.

BERTRAM, Cornelius Bonaventure, in *Biography*, a learned orientaliſt, was born at Thouars, in Poitou, in 1531, and became profeſſor of Hebrew at Geneva, and afterwards at Lauſanne, where he died in 1594. His works are "A Diſſertation on the Republic of the Hebrews," 8vo. Geneva, 1580, and Leyd. 1641; "A Reviſion of the French Bible of Geneva," Gen. 1588, which is more correct and liberal than the other, and is uſed by the Calviniſts at the preſent time; "A new edition of Pagnin's Treaſure of the Sacred Tongue;" "Parallel of the Hebrew and Syriac Languages;" and "Lucubrationes Frankendaleuſes," Frank. 1586. He contributed alſo to the edition of Mercerus's comment on the book of Job. Gen. Dict. Nouv. Dict. Hiſt.

BERTRAND, Gabriel, a ſurgeon of eminence at Paris, publiſhed, in 1610, in 8vo. "A Refutation of the Errors contained in Guillemeau's Deſcription of the Muſcles of the Human Body," which is much commended by Portal; alſo "Les Verités Anatomiques et Chirurgicales des Organes de la Reſpiration, et des artificieux moyens dont la nature ſe ſert pour la preparation de l'air," Paris, 1629, 12mo. He had obſerved pus formed in the cheſt to be abſorbed and conveyed out of the body with the urine. Haller. Bib. Anatom.

Bertrand, John Baptist, born at Antigues, July 12th 1670, was member of the academy at Marſeilles, where he alſo practiſed medicine with reputation and ſucceſs. He publiſhed "An Hiſtorical Account of the Plague," which deſolated that city in the year 1719, of which he was witneſs; alſo "Letters addreſſed to M. Deidier on the Cauſes of Muſcular Motion;" and "Diſſertations on the Effects of Sea Air." He died September 10, 1752, aged 82 years. Eloy. Dict. Hiſtor.

Bertrand *de Comminges*, *St.* in *Geography*, a town of France, in the department of the Upper Garonne, and chief place of a canton, in the diſtrict of St. Gaudens. Before the revolution, it was the ſee of the biſhop of Comminges; diſtant 3 miles ſouth-weſt of St. Gaudens. Its population is eſtimated at 639, and that of the canton at 8165 perſons. Its territory comprehends 137½ kiliometres, and 18 communes.

BERTRANDI, Ambrose, in *Biography*, a celebrated anatomiſt and ſurgeon of Turin, where he was born, October 8, 1733. Shewing early marks of an uncommon genius and talents for his profeſſion, he was ſent by his ſovereign to Paris, and afterwards to London, to acquire a knowledge of the improvements making in theſe places. At London, he was for ſix months under the direction of Mr. Bromfield, then at the head of his profeſſion. Having employed three years in his travels, in 1754 he returned to Turin, where he was preferred to the offices of profeſſor extraordinary, and principal ſurgeon to the king. In 1748, he publiſhed, in 8vo. "Diſſertationes duæ anatomicæ, de hepate, et de oculo," which have conſiderable merit. But his principal work was publiſhed at Nice in 1763, 8vo. under the title of "Trattato della operazioni di chirurgia," in which he has deſcribed the manner of performing the principal operations in ſurgery. The work was tranſlated into French by M. Solier, and publiſhed at Paris, in 1769, with engravings. He died in 1765, in the 43d year of his age. Hall. Bib. Chir. Eloy. Dict. Hiſt.

BERTROMONTIER, in *Geography*, a town of France, in the department of the Voſges, and chief place of a canton, in the diſtrict of St. Dié, 4 miles eaſt of St. Dié.

BERVA, a diſtrict of Africa, in the ſouthern part of the country called "Kiaſerak" by the Arabians, and by us "Cafraria." See Brava.

BERVAN, a town of Aſia, in Tartary, in the kingdom of Thibet, near the lake Bervan, which lake is ſaid to be 40 leagues long and between 30 and 34 broad.

BERVIE, or Inverbervie, a royal burgh in the county of Kincardine, Scotland. N. lat. 56° 44'. W. long. 2° 4'. It is ſeated on the eaſtern coaſt, at the mouth of the river Bervie, called *Bervie bay*, which forms a ſmall harbour for fiſhing-boats. This town was conſtituted a royal burgh in 1342, by charter from king David, who, being at ſea, was forced in here by ſtreſs of weather, and kindly received and entertained by the inhabitants. The place where he landed is ſtill called *craig David*. In 1595, James VI. renewed the charter, with all its former privileges and immunities. This town has loſt nearly the whole of its trade and commerce, and many of its houſes are fallen to decay. Moſt of the fiſhermen who frequented this port are removed to Gourdon, a village about two miles ſouth, where they enjoy a more eligible ſituation. Freſh water has lately been brought into the town by means of pipes, and a new bridge has been recently thrown acroſs the river Bervie. The population of the borough is about 607 perſons.

BERVINE, a river of the Netherlands, which paſſes by Dalem, and runs into the Meuſe, near Viſet.

BERVISCH, in *Ichthyology*, the name by which the Hollanders call the lump-fiſh; *cyclopterus lumpus* of Linnæus.

BERULLE, Peter de, in *Biography*, cardinal and founder of the congregation of the fathers of the oratory in France, was born at Serilly near Troyes, in 1575, and educated with a view to the eccleſiaſtical profeſſion, firſt among the Jeſuits, and afterwards in the univerſity of Paris, where he was diſtinguiſhed by his proficiency in literature, and by the amiableneſs of his diſpoſition. Such were his attainments in doctrinal and controverſial divinity, that he bore a principal part in the conference at Fontainbleau, in 1600, between cardinal du Perron on behalf of the catholics, and du Pleſſis Mornay on the ſide of the proteſtants. At this time he was almoner to king Henry IV.; and in 1604, he was employed in bringing over a colony of Carmelites from Spain, and ſettling them at Paris; of this order he was conſtituted ſuperior-general. The firſt foundations of the congregation of the oratory of Jeſus were laid by him in 1611, and from this inſtitution he derived the greateſt honour. See Oratory. After the death of Henry IV., Berulle was chief of the council of the queen-mother, Mary of Medicis, and he took an active part in promoting conciliatory meaſures between the contending parties during the minority of Lewis XIII. In 1624, he was deputed on a commiſſion to Rome, to ſolicit a diſpenſation for the marriage of the princeſs Henrietta Maria, to Charles I. of England; he was appointed her confeſſor, and accompanied her to take poſſeſſion of the throne. But as he ſtrenouſly and inflexibly maintained her ſtipulated rights, he contributed in ſome meaſure to the miſchief that reſulted from this impolitic union, and at length incurred the reproach of a diſmiſſal. The duke of Buckingham, as he ſays, complained of him to the king of having conſpired againſt his life and fortune. On his return to France, he was active in urging the proceedings againſt the Calviniſts at Rochelle. Having refuſed ſeveral rich benefices and biſhoprics, he was nominated cardinal by Urban VIII., without his knowledge, in 1627; but he continued his abſtemious and mortified mode of living; and at length, exhauſted by his labours and auſterities, he died during the celebration of maſs, Oct. 2, 1629. His numerous pieces in controverſial theology were collected and publiſhed in one volume folio, in 1644, and have ſince appeared in two other editions. Gen. Dict.

BERUS, in *Geography*, a town of France, in the department of the Moſelle, and chief place of a canton, in the diſtrict of Sar-Louis, 4 miles S.S.W. of Sar-Louis.

Berus, in *Zoology*. *Coluber berus* is the common European viper. Linnæus, who, in deſcribing the *amphibia ſerpentes*, conceived it quite ſufficient to diſtinguiſh all the ſpecies of the ſeveral genera included in that order, by the number of abdominal ſcuta, or plates on the belly, and the ſcales on the tail, ſtates them at 146—39. Fn. Suec. Amoen. Acad. &c. The opinion entertained in this reſpect by that eminent naturaliſt, we perceive from later obſervations on the ſpecies he deſcribes, was not perfectly correct This is exemplified for inſtance in the common viper, in which both the abdominal plates and caudal ſcales are liable to vary in point of number; one writer ſpeaks of the viper having 148—42, Weigel, &c.; another (Scopoli) mentions 177—68, &c. Notwithſtanding therefore the example of Linnæus to the contrary, we cannot but approve of characters taken rather from the various marks, ſpots, and other ſtriking particulars in the general appearance of the ſpecies in this order, as Linnæus has done himſelf in the reptile tribe. Dr. Shaw ſeems alſo to prefer the latter, conſidering the number of plates on the belly, and ſcales on the tail, in a ſecondary point of view. He thus deſcribes the common viper: *Coluber* cinereus, maculis capitis biloba, vitta dorſali atra dentato repanda. *Cinereous viper*, with a bilobate ſpot, and a black ſlexuous zigzag bend down the back.

Gmelin, in the Syſtema Naturæ, has four varieties of coluber berus; namely, (β.) a native of India, in which the ſpots along the back are roundiſh and confluent, ſo as to form almoſt one continued ſtripe; thoſe ſpots near the tail are diſpoſed tranſverſely. In the iſland of St. Euſtace, another variety (γ.) is alſo found, of a ſubrufous colour, with the head variegated, and the neck ſlender. (δ.) This inhabits India, and is diſtinguiſhed by having the arch of the occiput, or hind head, intercepting a white ſpot. The fourth ſort (ε.) has an aggregated ſpot of many parts on the head; and is a native of the Celebes. Figures of all theſe varieties of *coluber berus* are to be found in the magnificent work of Seba.

The common viper of Europe and northern Aſia is the ſame as that found in this country. With us, the viper ſeldom exceeds the length of eighteen inches or two feet. Pennant tells us, he once ſaw a female viper almoſt three feet in length, obſerving at the ſame time, that the females are uſually one third larger than the males. The colour, generally ſpeaking, is of a ſilvery greyiſh, or tawny brown, paler or more vivid in different individuals, and ſometimes blackiſh all over; but in all theſe varieties the ſpots are pretty nearly the ſame, the back being marked with a chain or ſeries of rhomboidal ſpots connected with each other, and forming one continued indented ſtripe from the head to the extremity of the tail. A ſeries of dark or duſky ſpots extends likewiſe along each ſide of the body; other ſpots appear again on the belly, which in moſt ſpecimens is almoſt entirely black, and finely gloſſed with purple. The ſituation of the fangs proves the viper to be one of the poiſonous kinds of ſerpents; they are ſituated on each ſide of the fore-part of the upper jaw, and are commonly two in number, with a few ſmaller ones near them. Petiver deſcribes a black viper, *vipera Anglica nigrans*, which is thought to be nothing more than a dark variety of the common kind, *berus*. This, however, is not certain, and we ſhould heſitate in admitting it as a variety only, ſince Linnæus conſidered it, from the deſcription which Petiver has given, as the *coluber preſter* of his Fauna Suecica. For a further account of *coluber berus*, ſee Viper.

BERWICK, North, in *Geography*, a royal borough of Eaſt Lothian, in the county of Haddington, in Scotland. This town is of very remote antiquity, and has been a ſcene of conſiderable manufacture and commerce, but is now reduced to poverty, its harbour being in ruins, and a few cargoes of grain are the only exports from its quay. Its original charter was loſt or deſtroyed, and James VI. granted it a new one, under which it has ſince been governed. The pariſh extends about three miles along the ſea-coaſt, and conſiſts wholly of arable land, except a fine conical hill called *North Berwick Law*. This riſes immediately above the town, and forms a conſpicuous landmark to the ſailors who navigate the Frith of Forth. The ancient caſtle of Tamtallan ſtands about two miles from this town, and is elevated on a high rock, three of whoſe ſides are laved by the ſurge of the ſea, and the fourth guarded by a deep foſſe and drawbridge. See Bass. N. lat. 56° 40′. W. long. 2°.

Berwick, commonly called *Berwick-upon-Tweed*, is a large reſpectable town, ſituated between England and Scotland. From its having been a frontier garriſon town, long before the glorious æra of the union, and from its ſituation on the ſhore of the ocean and on the bank of an unfordable river, it was conſidered, when in poſſeſſion of the Engliſh, as a key to England, and when in poſſeſſion of the Scots, as a key to their own country. This peculiarity of ſituation rendered it a ſcene of repeated ſiege and devaſtation. Berwick is pleaſantly ſituated on the northern bank of the river Tweed, within half a mile of the German ocean; 336 miles north-weſt from London; and 54 miles ſouth-eaſt from Edinburgh. N. lat. 55° 48′. W. long. 1° 45′. The ground, on which the town ſtands, riſes gently from the river, and from its ſouthern aſpect, is rendered cheerful by the ſun. Its circumference, within the preſent walls, is about one mile and three quarters, but the circumference of the old walls extended two miles two hundred and eighty-two yards. The town of Berwick is mentioned as a place of ſtrength in the reign of Oſbert, one of the laſt kings of Northumberland, who died in the beginning of the ninth century. It was ſucceſſively conquered and poſſeſſed by the Saxons and Danes, until the Scottiſh king Gregory, who was cotemporary with Alfred the Great, took it by aſſault. It continued part of the Scotch dominions till about the year 1098, when it was given by Edgar to the ſee of Durham, but was again reſtored to the Scots. During the repeated wars between England and Scotland, this town and its caſtle were frequently taken and retaken by the armies of each kingdom, and in each direful conflict ſuffered materially. In one of theſe, between Alexander of Scotland and John of England, the greater part was deſtroyed by the latter, who made it a practice to conſume the houſe every morning in which he had lodged the preceding night. On the 2d of Auguſt 1291, the ſtates of England and Scotland, with Edward I., aſſembled at Berwick, to ſettle the claims of Robert Bruce and John Baliol to the Scottiſh crown, when the latter was appointed on the 17th of the following November. During theſe reigns Berwick was beſieged and conquered by Edward I.; and the conflict was ſo great, that Matthew of Weſtminſter ſtates the loſs of the Scots to amount to 60,000 perſons. An Engliſh parliament was ſummoned here in 1296, when the Scotch nobility paid homage to king Edward. In the following reign, Robert Bruce collected an army of 30,000 combatants, with which he entirely routed and diſcomfited Edward II. and his army near Stirling caſtle. This battle, commencing on Midſummer day, 1314, continued ſeveral days, and it is acknowledged by moſt authors, that the Engliſh ſuffered more in this conteſt than in any other ſince the time of William the Conqueror. It was in this battle that

that the privy ſeal was loſt; and Edward iſſued a proclamation from Berwick, informing his ſubjects of the circumſtance. Berwick was afterwards a ſcene of great revelry and rejoicings. The marriage of Joan, ſiſter to Edward III., with David of Scotland, was performed at this place with great pomp and oſtentatious ſolemnity. In ſpite of this family alliance, the two kingdoms ſoon returned to their former hoſtilities, and Berwick became the ſeat of many battles and deſtructive ſieges. It was ſeveral times afterwards in the poſſeſſion of each country, and never relinquiſhed by either without a vigorous and obſtinate reſiſtance. In the reign of Richard III. of England, and James III. of Scotland, commiſſioners were appointed by each crown to aſcertain the limits of Berwick; and it was agreed, that the ground in diſpute ſhould remain uncultivated, unbuilt, and uninhabited. But in 1502, this agreement was annulled by another, which ſtipulated that the town and caſtle ſhould be "preſerved in perpetual peace, friendſhip, league, and confederacy." In the ſame year was ſolemnized the marriage of Margaret, eldeſt daughter of Henry VII., with James IV. king of Scotland; but this circumſtance did not terminate the jealouſies and animoſities between the two kingdoms, as Edward VI. marched to Berwick with a large force, which was augmented by a fleet of 34 ſhips, 30 tranſports, and a galley. Theſe lay encamped here for ſome time, and were deſtined to invade Scotland. This monarch, and Mary queen of Scotland, by treaty, made Berwick a county town, and declared it independent of both ſtates. Queen Elizabeth fortified and inveſted it with a ſtrong and expenſive military eſtabliſhment, conſiſting of 980 men, whoſe annual ſalaries amounted to 12,734l. 19s. 2d. All this was abrogated, and the place rendered peaceable by James VI. of Scotland, who was proclaimed at Berwick, in the year 1603, king of England, France, and Ireland. The union of the two kingdoms, in 1707, terminated the long ſeries of hoſtilities, which had proved ſo deſtructive to the commerce, population, and agriculture of the borders, and to this place in particular.

Berwick, though originally a Scots town, was erected into an Engliſh borough, at a very early period, and its laſt charter was granted by James I.; under which the burgeſſes claim their various privileges, immunities, &c. as well as ſome large territorial poſſeſſions and domains. It has an exempt juriſdiction, and is independent of the adjoining countries of Durham and Northumberland, yet it is not a county in itſelf. Since the union, it has been partly ſubject to the Engliſh laws, but is locally regulated by its own code. The town is governed by a mayor, recorder, four bailiffs, and an indefinite number of aldermen. The firſt is annually elected, and receives 100l. during his mayoralty. Two members of parliament are returned from this town, and the number of electors amounts to nearly one thouſand, though not more than ſeven hundred have been known to vote at one election. Several manufactures are eſtabliſhed here; the principal of which are for making damaſk and diaper, ſacking, ſail-cloth, cotton and muſlins, ſtockings, carpets, felts, hats, boots, ſhoes; beſides ſeveral others connected with the ſhipping. The coaſting trade and foreign commerce of Berwick are very conſiderable, though about ſixty years ſince, only two ſmall veſſels of fifty tons each were employed between this place and London. Now about 40 veſſels belong to this port, whoſe principal lading conſiſts of ſalmon and eggs. The firſt are moſtly caught in the river Tweed, whoſe fiſheries afford a great revenue to the proprietors, and give employ to about 300 men. The ſalmon fiſhing continues from the 10th of January till the 10th of October, during which time above 40,000 kits of theſe fiſh, beſides a vaſt quantity of ſalmon trout, have been ſent to London. The latter are often conveyed alive in the holds of the veſſels. About 80 boats are employed on the Tweed; and the yearly rentals of all the fiſhing waters amount to nearly 10,000l. The article of eggs is alſo a curious and lucrative branch of trade: they are brought to this town in carts and panniers from all parts of the adjoining country, and moſtly parted for grocery goods. From the 10th of October 1797 to the 10th of October 1798, 5254 cheſts of eggs were ſent hence to London. The vaſt increaſe of trade at this port may be eſtimated from the cuſtom-houſe revenue, which has riſen in the laſt 20 years from 1000l. to 6000l. a year.

It was the univerſal practice, till within theſe few years, to boil all the ſalmon before it was packed up in the kits; but in 1788, a new mode was adopted, and has continued ever ſince. This conſiſts in packing it with ice, which being wanted in great quantities, induced the merchants to conſtruct ſeveral ice-houſes near the town. In the year 1798, the two companies of Berwick laid in 7600 cart loads, which coſt them about 450l. There are 32 ſalmon coopers in this town. Four modes of catching ſalmon are practiſed here; the ſweep, the ſtill, the bobb, and the hanging nets. (See SALMON.) Beſides the ſalmon-fiſhery, the herring and lobſter fiſhery employs ſeveral hands. The latter are caught in cruives, which are three feet in length and one and a half in height. Theſe have a hole at each end, where the lobſters are tempted to enter for the incloſed baits.

The *Public Buildings* are the governor's houſe, the barracks, the ordnance-houſe, the main-guard, the town-hall, reſervoir, church vicar's houſe, and the bridge; all theſe are conſtructed with ſtone, and the two firſt were built in 1719. The town hall is a handſome building of three ſtories, with an ornamental tower and ſpire at one end. It was built from the deſigns of Joſeph Dodds, and finiſhed in 1754. The church was built, in 1652, under the direction of colonel George Fenwicke; but it has neither tower nor bells: theſe are annexed to the town hall. The bridge over the Tweed is conſtructed with fine hewn ſtone, and has fifteen ſpacious arches. It extends 1164 feet in length, and 17 in width, and was finiſhed building October 12, 1634, after a period of 24 years 4 months and 4 days, from the commencement.

Here are a charity-ſchool, and ſix free-ſchools, alſo a cuſtom-houſe and exciſe-office. Berwick is ſtill ſurrounded with fortified walls, which are mounted with 54 guns. It has four principal gates, and has a complete garriſon eſtabliſhment, to which Holy iſland is an appendage. Among the antiquities of the town, are the remains of its ancient caſtle, and a pentagonal bell tower near it, a ſquare fort of Magdalane fields, entrenchments on the top of Hallydown hill, and an old pier called queen Elizabeth's pier.

Here is one weekly market on Saturdays, and one annual fair; but the corporation has eſtabliſhed three annual markets, called High markets, for the hiring of ſervants, and ſelling of horſes, cattle, &c. Fuller's Hiſtory of Berwick-upon-Tweed, 8vo. 1799.

BERWICK, or *Abbotſtown*, a neat town of America, in York county, Pennſylvania, at the head of Conewago creek, 103 miles W. by S. of Philadelphia, 23 miles W. of York, and 26 miles S. S. W. of Harriſburg. This town is regularly laid out, and contains about 100 houſes, and a German Lutheran, and Calviniſt church. N. lat. 39° 54'.

BERWICK, or *New Berwick*, a ſmall town of Northumberland county, in Pennſylvania, on the north-weſtern ſide of the eaſt branch of Suſquehannah river, oppoſite Neſcopeck falls and Neſcopeck creek, 32½ miles north-eaſt from Northumberland

thumberland and Sunbury, at the junction of the eaſt with the weſt branch of the Suſquehannah, and 160 north-weſt of Philadelphia. N. lat. 41° 3′.

Berwick, a townſhip of York county, and diſtrict of Maine, containing 3894 inhabitants. It has an incorporated academy, and lies on the eaſt ſide of Salmon Fall river, 7 miles N. W. of York, and 86 E. by N. from Boſton.

BERWICKSHIRE, a county of Scotland, famous in the hiſtorical annals of Britain for the many deſperate battles fought between the Engliſh and Scots within its boundaries. This county formerly conſtituted about half of the earldom of Dunbar or March, and is generally called by the country people *Merſe*. It is nominally divided into three diſtricts, reſpectively called Lauderdale, Lammermuir, and Merſe, or Marſh. The latter comprehends the moſt beautiful ſubdiviſion, and follows the courſe of the Tweed, from the foot of the Elden hills to within a few miles of Berwick. Lauderdale is the valley which accompanies the river Leader, or Lauder, whoſe waters are celebrated in Scottiſh ſong. Lammermuir comprehends the ridge of hills, which ſeparates this county from eaſt Lothian, and is chiefly appropriated to the feeding of ſheep and black cattle. This county is bounded on the north by Haddingtonſhire, on the eaſt by the German ocean, on the ſouth by the river Tweed, which divides it from Northumberland in England, and on the weſt by the counties of Roxbury, Peebles, and Midlothian. Its length is eſtimated at 32 miles, and breadth at 17 miles. It is divided into 32 parochial diſtricts; and beſides the royal borough of Lauder, has the towns of Greenlaw, Dunſe, Coldſtream, Coldingham, Ayton, and Eyemouth, within its limits. The chief rivers of the county are the Tweed, the Leader, the Eye, the Whiteadder, and the Blackadder. The ſtate of agriculture in this county is highly improved within the laſt twenty years; and many parts that were then uncultivated, are now incloſed and rendered profitable to the landlord and the huſbandman. By way of agricultural pre-eminence, this county is often called the Norfolk of Scotland. Many farms now let at 300l. and 400l. per annum, which at no very diſtant period were ſcarcely deſerving of notice. This increaſe of proſperity enables the county to export from the ports of Berwick and Eyemouth "above 80,000 bolls of victual annually;" and nearly the ſame quantity is conveyed to the markets of Edinburgh, Dalkeith, Haddington, and Dunbar. The minerals of this diſtrict hitherto diſcovered are few, and theſe not very valuable. Coal is found in ſmall quantities near Eyemouth; freeſtone is abundant; and rock and ſhell marl are found in different places. Copper has been obtained in the vicinity of Lauder; and ſome few years paſt a mine of the ſame ore was diſcovered in the pariſh of Bonkle. A ſmall quantity of iron ſtone is found in the pariſh of Mordington. The rocks, which compoſe the Lammermuir hills, are moſtly ſchiſtus, with alternate ſtrata of ſandſtone. At Eyemouth is a rock of Puddingſtone, which is found to contain fragments of porphyry, granite, and limeſtone. In the pariſh of Chirnſide, is a ſpecies of gypſum, which is advantageouſly uſed to manure certain lands. Near Dunſe is a celebrated mineral ſpring, which is much reſorted to. Its water, ſomewhat ſimilar to that of Tunbridge Wells, contains iron diſſolved in fixed air, with a little ſea ſalt and bittern; and its effects prove rather diuretic and corroborant. Among the gentlemen's manſions of the county, thoſe of Hirſel, the ſeat of the earl of Home, and of Marchmont, the ſeat of the earl of Marchmont, are the moſt conſiderable; though there are ſome other handſome manſions. Beſides the caſtle and fortifications of Berwick, there are ſeveral others in different parts of the county, particularly at Lauder, Cockburn path, Home, and Chapel on Beach. There were alſo ſeven nunneries, two hoſpitals, and one Dominican convent. Among the eminent natives of this county, the following names occur; James Thomſon, the poet; John Scott, or Duns Scotus, who was born at Dunſe. Of the ſame place, was John Brown, author of the Brunonian ſyſtem of phyſic: Thomas the Rhymer, or ſir Thomas Lermont, is diſtinguiſhed in the hiſtory of metrical romance. The real landrent of this county is eſtimated at 118,800l. ſterling. Home's Agricultural Report of Berwickſhire. Sir John Sinclair's Statiſtical Account of Scotland. Fuller's Hiſtory of Berwick.

BERWIN, or Berouin, a conſiderable range of mountains, which paſſes through parts of the counties of Montgomery, Merioneth, and Denbigh, in North Wales. The proſpect from different ſpots on the ſummit of this ridge ſtrikes the mind with awful aſtoniſhment. "Nature," ſays lord Lyttelton (Works, vol. iii. p. 337.), "is in all her majeſty there; but it is the majeſty of a tyrant frowning over the ruins and deſolation of a country. The enormous mountains, or rather rocks, of Merionethſhire, incloſed us all around. There is not upon theſe mountains a tree, or ſhrub, or blade of graſs; nor did we ſee any marks of habitations or culture in the whole place. Between them is a ſolitude fit for deſpair to inhabit; whereas all we had ſeen before in Wales ſeemed to inſpire the meditations of love."

BERY, Beria, or Berie, was anciently the name of the vill or ſite of the habitation of a nobleman, or of a dwelling or manſion-houſe, being the chief of a manor; formed of the Saxon "beorg," which denotes a hill or caſtle; for noblemen's ſeats were formerly caſtles, ſituate on hills, of which there are ſtill ſome remains. It was anciently taken for a ſanctuary. See Beria.

BERYL, or Beryll, βηρυλλος, *Aquamarine of Siberia, Berill*, Germ.; *Emeraude, vert bleuâtre*, Hauy; *ſilex ſmaragdus beryllus*, Werner.

The colour of the beryll is a blueiſh green, paſſing into mountain apple, or aſparagus green, and honey yellow on one ſide, and light ſky blue on the other. It is almoſt always found cryſtallized in rectangular ſix-ſided priſms, ſometimes truncated on the edges and angles; the ſides of the priſm are occaſionally alternately broad and narrow, and ſometimes convex, which gives the whole cryſtal a cylindric form. It is not unfrequent for the priſms to have the appearance of having been broken acroſs and imperfectly cemented together. Sometimes, inſtead of having plane ſurfaces at their extremities, they are convex or concave, like articulated baſaltes. The ſize of the cryſtals varies conſiderably, the ſmalleſt being always the longeſt in proportion to their diameter; ſome are of no greater magnitude than a hair, while others have been found a foot long and three or four inches in diameter. The beryll has many points of reſemblance with the emerald; and in particular the cryſtals of both are diviſible parallel to the ſides and extremities of a regular hexahedral priſm; on which account M. Hauy has comprehended them both under one ſpecies.

The beryll is externally ſhining, or little-ſhining, with a vitreous luſtre. Its parallel fracture is minute-conchoidal; the croſs fracture is completely conchoidal. It is generally tranſparent, but ſometimes is only ſemi-tranſparent or tranſlucid. It is ſufficiently hard to ſcratch quartz, though with ſome difficulty. Specific gravity of the light blue variety 2.67; of the blueiſh green 2.75; of the mountain green 2.65.

This mineral appears to have been firſt analyſed by Vauquelin, and afterwards by Roſe and Schaub, with the following reſults:

Silex,

	Vau.	R.	S.
Silex,	69	69.5	66.5
Alumine,	13	14	16.75
Glucine,	16	14	15
Lime,	c.5		
Oxyd of iron,	1	1	1
	99.5	98.5	99.25

In a common fire the beryll undergoes scarcely any change of colour, but it loses its transparency, and flies to pieces. At a more intense heat it becomes opaque and milk white, but shows no signs of fusion; by the assistance, however, of oxygen gas, it melts without much difficulty. Borax is a perfect flux for it.

The beryll is found in Daouria, upon the borders of China, near Nertschinsk, also in the granitic ridge between the rivers Onon and Ononborsa. It is found in rivers, accompanying rock-crystal, indurated clay, mica, fluor, wolfram, and arsenical pyrites.

The beryll, when cut and polished, has a considerable lustre; but its colour is for the most part but indifferent. It is ranked among the gems, but its value is trifling when compared with the ruby, sapphire, topaz, &c. Hauy. Emmerling. Widenmann.

Beryll, *Oriental*. See Corundum.

Beryll, *Brasilian*. See Tourmalin.

Beryll, Beryllus, is also a name given to a kind of crystal looking-glass, superstitiously consecrated to the purposes of conjuring and divination. Hence also the term *beryllistica*, used for the mysterious art of seeing future or distant events in such glasses.

BERYLLINA, in *Entomology*, a species of Chrysis, found in Europe. The head is greenish blue; thorax blue, greenish in front, behind bidentated; abdomen green, changeable to rufous and blue; legs blue, with testaceous dots. Linnæus, &c.

BERYLLINUS, a species of Cimex *(Spinosus)*; thorax obtusely spined, and dentated on the sides; tips of the spines and bifid shield of the head greenish blue. Linn.

BERYLLUS, in *Biography*, a learned and pious bishop of Bostra, or Bozrah, in Arabia, flourished about the year 230, and taught that Christ had no proper subsistence or divinity distinct from that of the father, before his birth of Mary; or that Christ did not exist before Mary, but that a spirit issuing from God himself, and therefore superior to all human souls, as being a portion of the divine nature, was united to him at the time of his birth. Many conferences were held with Beryllus on this opinion; and at last it was so completely refuted by Origen, and so much to the satisfaction of Beryllus himself, that he gave up the cause, and returned into the bosom of the church. The acts of these conferences were long preserved, and the dialogue between Origen and Beryllus was extant in the time of Jerom. Eusebius also refers to them. Eccl. Hist. l. vi. c. 33. Cave's Hist. Lit. vol. i. p. 122. Mosh. Eccl. Hist. vol. i. p. 306.

Beryllus, in *Entomology*, a species of Cimex *(Rotundatus)*, that inhabits India. It is of the middle size; pale; border of the thorax orange; wing-cases with a ferruginous spot, and marginal black lines. Fabricius.

BERYTIS, in *Ancient Geography*, a town of Asia Minor, in the Troade. Steph. Byz.

BERYTUS, Bairout, Berout, or Beirut, a town of Phœnicia, situated about 24 miles south of Byblus. Stephanus Byz. says, that it was so called on account of its waters. Others deduce its name from Beröe, as it was sometimes called by the poets, who was a nymph of the ocean, and the nurse of Semele. Bryant supposes it to have been derived from Baris, Barit, or Barith, the ancient name of the ark, but properly signifying a covenant; and that it was the city of the ark, where the Canaanite or Phœnician deity Baal-Berith had a temple, and where the rites of his worship were performed. This city is not much inferior to Byblus in antiquity, since it is said to have existed in the time of Cronus. The kings of Egypt had possession of it; but when Antiochus the Great subdued this province, it became subject to the kings of Syria, and remained under the successors of this prince till the time of Diodotus, denominated "Tryphon," who entirely destroyed it about 140 years before the Christian æra. The Romans, after the conquest of Syria, rebuilt it near the spot where the ancient city had stood. Agrippa, the grandson of Herod the Great, decorated it at an immense expence with a theatre and amphitheatre, baths, and porticoes, and established in it magnificent games, mentioned by Josephus in his "Antiquities." It was in this city that Herod the Great, by permission of Augustus, held an assembly which condemned to death his sons Alexander and Aristobulus, under the false accusation of Antipater, their eldest brother, for having conspired against the life of their father. Titus, the son of Vespasian, came to Berytus, after the capture of Jerusalem, to celebrate the feast of the birth of his father; according to Josephus "De Bello." Berytus enjoyed the privilege of the "jus Italicum," according to a law of the Digest. Pliny (H. N. l. v. c. 20.) and Josephus (De Bell. Jud.) informs us, that it was a Roman colony. Under the Roman emperors, Berytus was no less famous for the study of the law in the east, than Rome was in the west; and hence it was styled by the emperor Justinian "the mother and nurse of the laws." The civil law was taught here in Greek, as it was at Rome in Latin. It is not certainly known by whom the academy was founded; but that it flourished long before the reign of the emperor Diocletian, is manifest from a decree of that prince. According to Heineccius (Jur. Rom. Hist. p. 351—356.), the splendour of this school may be computed to have lasted from the third to the middle of the sixth century; and its institution has been ascribed to Alexander Severus. From this academy the two famous civilians Dorotheus and Anatolius were called by Justinian, that they, in concurrence with others, might be employed in comparing the Digests; and that prince would allow of no other academies, but those of Rome, Berytus, and Constantinople, to explain the laws. This city was overthrown by an earthquake in the 25th year of Justinian, A. D. 551, July 9; and as the schools of Berytus were filled with the rising spirits of the age, many youths were probably lost on this disastrous occasion, who might have lived to be the scourges or guardians of their country. The metals of this city are bronze, gold, and silver. After it became a Roman colony, its medals had a legend, Col. Fel. Ber. *i. e.* "Colonia felix Berytus," and were struck in honour of Cæsar, Augustus, Tiberius, Claudius, and other Roman emperors. For the present state of Berytus, see Bairout. The suburbs are almost as large as the city itself, consisting of gardens, with a house for the owner in each; and these, interspersed among the numerous fruit trees, particularly olives and figs, which this fertile soil supports, give the whole a picturesque and beautiful appearance. European vessels, in the summer, anchor near a small point of land, which runs into the sea before the city, and is called "Beirût point;" but in the winter, they cast anchor to the north, in a kind of gulf, which is sheltered from the north and east winds by the mountain, and is said to be very serene. The staple commodity of the country is raw silk, which is carried to Cairo, Damascus, and

and Aleppo, and part of it to Europe. They alſo fabricate a kind of jars and jugs of earthen ware, which, from the peculiar nature of the clay in the adjacent country, are highly eſteemed, and carried to all parts of the coaſt. Brown's Travels in Africa, p. 377.

Berytus, a town of Arabia, formerly called Dioſpolis. Steph. Byz.

BERZETIN, in *Geography*, a town of Hungary, in the diſtrict of Gomor, not far from the river Sajo, and formerly noted as the reſidence of many noble families.

BERZETTO, a town and abbey of Italy, in the duchy of Parma.

BERZOWITZ, a town of Hungary, 12 miles N.N.E. of Leutſch.

BES, or Bessis, an ancient Roman weight, containing two-thirds of the *as*, that is, eight *unciæ*. See As.

The bes originally weighed two aſſes; whence the origin of the word *quaſi binus as*. Though Scaliger conjectures it to have been formed from *dues*; as *bellum* from *duellum*, or *bonum* from *duonum*. *Bes* was alſo a linear meaſure of the ancient Romans. *Bes* was alſo a meaſure of capacity.

Bes was alſo uſed in the menſuration of lands, to denote two-thirds of a *jugerum*, or acre. See Measure.

Bes was alſo a money of account, and a current coin among the ancient Romans. See Coin, and Money.

BESA, in *Ancient Geography*, an ancient city of the Thebaide upon the Nile, conſecrated to a god of that name, but formed into a new city by Adrian, who built a temple in it in honour of Antinous, and called it *Antinoe* or *Antinopolis*; which ſee.

Besa, in *Mythology*, a deity belonging to the city of Abydus in the Thebaide, mentioned by Ammianus Marcellinus in his Hiſtory, lib. xix. The mode of conſulting the oracle of this deity was by writing the ſubjects of inquiry on ſealed billets, which the prieſts carried into the ſanctuary of the god, and to which they brought back the anſwers. Iſaac Caſaubon has ſuggeſted, in conſequence of a paſſage occurring in the Bibliotheca of Photius (Cod. 279.), that this deity was adored at *Antinoe*, or *Antinopolis*; which ſee.

BESAILE, or Besayle, Fr. denoting the father of the grandfather, in the *Common Law*, a writ that lies where the great-grandfather or great-grandmother was ſeiſed the day that he or ſhe died, of any lands or tenements in fee-ſimple; and after his or her death, a ſtranger entered the ſame day upon him or her, and keeps out the heir.

BESALU, in *Geography*, a town of Spain, in Catalonia, at the foot of the Pyrenées, erected by pope Benedict VIII. into an archbiſhopric, but ſoon after ſuppreſſed; 7 leagues from the Mediterranean, and 5 north from Gerona.

BESANÇON, a city of France, and before the revolution the ſee of an archbiſhop, and capital of Franche Compte, now of the department of the Doubs. This city is ſurrounded by mountains, and ſeated on the river Doubs, which divides it into the upper and lower town, joined by a handſome bridge. Of the former, nothing remains except the caſtle, or citadel, which is a long ſquare built on a ſharp rock, and commanding the city, which is defended by a wall flanked with eight towers like baſtions. The latter has three long and handſome ſtreets, which are adorned with houſes built of free ſtone, and covered with ſlate; chiefly about the ſquare called "Battan," which is ornamented with a fountain, whoſe water proceeds from the ſtatue of Bacchus. The metropolitan church is built at the bottom of St. Stephen's hill, and is a handſome ſtructure, with a high tower ſteeple. In the middle of the choir is the great altar, on which they expoſe at certain times, relics in ſilver ſhrines enriched with gold and jewels. Near the church of Notre Dame is a triumphal arch, erected in honour of the emperor Aurelian, on which are ſeen ſeveral mutilated figures of men and animals. This ſerves as a gate to the cloiſter of St. John the Great. The great hoſpital of the order of St. Eſprit, for foundlings, is a ſtructure worthy of notice. The priſon is remarkable for its excellent economy, and the humane attention paid to its unhappy occupiers. The town-houſe is a large edifice with four wings, having in its front the ſtatue of Charles V. in bronze, with a globe in one hand, and a ſword in the other. The imperial eagle is raiſed over a large baſon, and ſpouts out water by both its beaks. The governor's palace is magnificent; and beyond it is a fountain, adorned with the figure of a naked woman diſcharging water at her nipples. Under the Romans, this was one of the moſt magnificent places which they had in Gaul, and many remains of their ſuperb buildings are yet viſible. After the death of Julian, it was almoſt deſtroyed by the Germans, and a ſecond time by Attila. It afterwards became an imperial city, till the time of Lewis XIV, who, in 1674, made himſelf maſter of it, repaired its fortifications, and united it to France. The univerſity of this city is an ancient and celebrated foundation; and in the year 1752 a literary and military ſociety was inſtituted in this place. It contains 8 pariſhes; and the number of inhabitants, which was formerly eſtimated at 40,000, is now ſuppoſed to be reduced to 30,000. The canton of north Beſançon is ſaid to contain 15,618, and that of ſouth Beſançon 16,662 perſons. The territorial extent of Beſançon comprehends 97¾ kiliometres; the former canton includes 3, and the latter 4 communes. N. lat. 47° 13′ 45″. E. long. 6° 2′ 40″.

About 20 miles from Beſançon, near the abbey of "Grace Dieu," there is a natural ice-cellar, in a very romantic ſituation. On the higheſt part of a mountain, covered with a thick grove of lofty trees, is the opening of the cavern, which reſembles by its depth, ſaid to be above 220 feet, and by the ſolemn gloom of the ſurrounding wood, what poets have feigned of the deſcent into the infernal regions. The cavern itſelf is 60 feet in length and height, and 40 in breadth; the bottom is covered with ice, of which vaſt pyramids riſe from it, while others appears ſuſpended from the arched roof, with their points oppoſite to thoſe of the former. Within the cave is a hole or well, always full of water, and never frozen; and, at the entrance, ſome mould, which ſeems to have been accidentally thrown there, and adorned with primroſes and other wild flowers. The ice, which in the cavern appears of a beautiful azure, is, when ſeen by daylight, remarkably white. From this natural repoſitory, the ice-houſes in Beſançon are ſupplied, when the winters are too mild to freeze water in the open air. This cavern has been the ſubject of repeated inveſtigation, the reſult of which may be ſeen in the "Memoirs of the Academy," for 1712 and 1726.

BESANT, or Bezant, Bizant, or Byzant, a ſort of coin, ſtruck at Byzantium, in the time of the Chriſtian emperors, and well known in England, and indeed all over Europe, for ſome ages before the Norman conqueſt. Few coins ever had a longer or more univerſal currency than theſe beſants or byzantines; having been current from the very beginning to the end of the eaſtern empire, not only in all its provinces, but alſo in all thoſe countries which had been provinces of the weſtern empire, and amongſt others in Britain. With us gold and ſilver beſants were received in payments. But though they are frequently mentioned by all the hiſtorians of the cruſades, they are rarely ſpoken of by ours. Neither are they named in Domeſday book, nor in the public acts of Henry I. or Stephen, nor in the laſt will of king Henry II. However, ſome mention is made of them in private deeds and leaſes, and alſo in the Exchequer rolls under Henry

Henry II. The gold befant was pure, or twenty-four carats fine; but writers are not generally agreed with refpect to its value. Out of the Greek pound of gold, which was the fame with our Tower pound, 72 byzantines were coined, each weighing 73 troy grains, and worth 40 Saxon pennies, 8 Saxon fhillings, and 9 fhillings and four-pence halfpenny of our prefent money. (Henry's Hift. vol. iv. p. 275.) The filver befant, in the 12th century, was rated at two fhillings English. (Lyttelton's Hift. of Henry II. vol. i. p. 411.) Hence the gold offered by the king at the altar, or feftivals, is ftill called befant, or bifant. Thirteen befants, or bifantines, were prefented at the mafs at the coronation of the kings of France. Henry II. had that number coined on purpofe.

Besants, in *Heraldry*. See Bezants.

BESARABA, in *Geography*, a town of European Turkey, in the province of Bulgaria, 48 miles north of Ternova.

BESBICUS, in *Ancient Geography*, a fmall ifland of the Propontis, now the fea of Marmora, fituate between Cyzicum and the mouth of the Rhyndacus. This, according to Pliny (N. H. l. ii. c. 8.), is one of thofe iflands which, being firft joined to the continent, were feparated from it by the violence of the fea, or by earthquakes.

BESBOROUGH, in *Geography*, an ifland in Norton found, on the weft coaft of North America. N. lat. 64° 10'. W. long. 161° 15'.

BESBRE, a river of France, in Nivernois.

BESERG Henlu, a town of Afiatic Turkey, in the province of Caramania; 24 miles north of Akferai.

BESHARRAI, a village of Syria, fituate among the mountains in the pachalic of Tripoli, on the road to the Cedars, and diftant from them 3 leagues, which is frequented by the Europeans, and where the miffionaries have a houfe. During the winter, many of the inhabitants leave their houfes under the fnow, with fome perfon to guard them, and remove to the fea-coaft.

BESHETZK, or Bezetzk, a diftrict in the government of Tver in the Ruffian empire, fituate on the Mologa. N. lat. 58° 30'. E. long. 34° 44'.

BESIEGERS, and Besieged, in the *Military Art*, denote thofe who lay fiege to a fortified place, and thofe who defend it. See Siege.

BESISHEIM, in *Geography*. See Bescigheim.

BESILLUS, in *Ancient Geography*, a river of Spain, in Betica.

BESISTAN, or Bezestein, a name given to thofe places at Conftantinople, Adrianople, and fome other towns in the dominions of the Grand Seignior, where the merchants have their fhops, and expofe their goods to fale. A particular befiftan belongs to each clafs of merchants and workmen. Thefe befiftans are commonly large galleries vaulted over, whofe gates are fhut every night. The wardens, or keepers, will fometimes be anfwerable for the merchandife, on being paid a moderate perquifite for each fhop. See Bazar.

BESLER, Jerom, in *Biography*, born at Nuremberg, Sept. 29th, 1566, and created doctor in medicine at Bafle in 1592, was in fuch reputation for his learning, and ability in his profeffion, that he was feven times appointed dean of the college at Nuremberg, and infpector of the medicines ufed by the apothecaries there. He died November, 1632.

Besler, Basil, brother to Jerom, was born at Nuremberg in 1561, where he fettled as an apothecary. Applying to the ftudy of botany, he foon became confpicuous in that branch of natural hiftory. In 1613, he published "Hortus eyftettenfis, five diligens et accurata omnium plantarum ex variis orbis terræ partibus, fingulari ftudio collectarum, quæ in celeberrimis viridariis arcem episcopalem ibidem cingentibus, hoc tempore conspiciuntur, delineatio, et ad vivum repræfentatio," Nuremb. 1613, in 4 vols, Atlas folio. The moft fplendid botanical work, Haller fays, that had then appeared. The plates, 356 in number, and delineating 1533 plants were engraved at the expence of Conrad, bifhop of the diocefe. The work is unequal in its execution, as befides the errors committed in the defcription of many of the plants, fome of the delineations are fictitious, taken from fancy, or from the rude accounts of ignorant travellers. But the far greater part of them are correctly drawn, and beautifully executed. As Bafil was ignorant of the Latin language, his brother Jerom furnifhed the preface. He alfo published "Fafciculus rariorum, et adfpecta dignorum varii generis, quæ ceri incidi curavit," Norib. 1616. 4to. Max. containing fome marine plants and fruits; alfo, "Icones florum et herbarum, &c." fol. 1622. It is a continuation of the hortus eyftettenfis, which have been feveral times reprinted. The time of his death is not known. Haller Bib. Bot.

Besler, Michael Rupert, fon of Bafil, was born in 1607. Having paffed fome years at Altdorf, where he was admitted doctor in medicine, he returned to Nuremberg, and was advanced to the fame offices that had been enjoyed by his uncle. In 1631, he published, in 4to. "De fanguine fecundum et præter naturam;" and in 1640, folio, "Admirandæ fabricæ humanæ muliebris partium generationi potiffimum infervientium, et fœtus fidelis quinque tabulis hactenus nunquam vifa delineatio." The work is ingenious, but the plates, which are copied from Fabricius, are ill executed. This work was followed, in 1642, by "Gazophylacium rerum naturalium ex regno vegetabili, animali et minerali de promptarum fidelis repræfentatio," fol. and the fame year, by "Obfervatio medica fingularis, mulieris tres filios enixæ," 4to.

BESLERIA, in *Botany*, fo named by Plumier after Bafil Befler, an apothecary at Nuremberg, editor, with the affiftance of Jungermann, of a fumptuous work, entitled "Hortus eyftettenfis," 1613. Lin. Gen. *n.* 755. Reich. 813. Schreb. 1012. Plum. 5. Jacq. Amer. 187. Juff. 121. Gærtn. t. 52. Clafs and order, *didynamia angiofpermia*. Nat. Ord. *Perfonatæ. Scrophularis*, Juff. Gen. Char. *Cal.* Perianth one-leafed, five-parted, acuminate, erect, loofe, with reflected tops. *Cor.* monopetalous, ringent; tube the length of the calyx, roundifh, gibbous on one fide at the bafe, and at the top; border five-cleft, divifions roundifh, the lowermoft largeft, and the two upper lefs divided. *Stam.* Filaments four, within the tube of the corolla, of which two are a little fhorter; anthers oblong, twin, hanging down on each fide. *Pift.* Germ globular, fitting on a glandulous body, which embraces it, and is permanent, cordate where the corolla is gibbous; ftyle fubulate, erect; ftigma bifid, obtufe. *Per.* Berry fubglobular, one-celled; partition, two oppofite femi-ovate laminas, not cohering. G. *Seeds* numerous, round, very fmall, neftling, fixed to the inner furface of the berry.

Ess. Char. *Cal.* five-parted; berry fubglobular, many-feeded.

Species, 1. B. *melittifolia*. "Peduncles branching; leaves ovate." It has a fmooth, woody, jointed ftalk; with two ovate nerved leaves oppofite at each joint, which are crenate at their edges; the flowers proceeding from the wings of the leaves upon fhort branching footftalks, each fuftaining fix or eight flowers. A native of South America. 2. B. *lutea*. Eriphia, Brown, Jam. 270. *β.* B. &c. fl. luteo, major, Plum. Gen. 29. "Peduncles fimple, crowded; leaves lanceolate." Rifing with a ligneous ftem, fix or feven feet high, divided towards the top into many irregular branches, with fpear-fhaped ferrate leaves, having many tranfverfe veins; the flowers iffuing at the wings of the leaves in large clufters, each

on a separate foot-stalk, and small, tubulous, of a pale yellow colour." A native of Martinico, Jamaica, &c. 3. B. *cristata*. "Peduncles simple, solitary; calyxes serrate-crested." A shrubby plant, differing in its habit from the foregoing, climbing up trees, and adhering to them by roots issuing from the joints; the twigs round, hirsute, and long; the leaves ovate, acute, serrate, hirsute, wrinkled, veined, petioled, opposite, two inches long; peduncles one-flowered, axillary, bent down, almost as long as the leaves; calyx bright scarlet; corolla yellow; stamens proceeding from a common membrane, fastened to the tube of the corolla, and cleft longitudinally at its gibbous part. Before the dispersion of the pollen, the filaments are upright; afterwards interwoven as in Martynia. A yellow conspicuous gland embraces the germ. A native of Martinico, in moist mountainous woods. 4. B. *bivalvis*. "Calyxes bivalve, torn." Stem herbaceous, long, creeping, hairy, round; leaves opposite, petioled, veined, hairy, nerved, a hand's breadth long; peduncles lateral, opposite, shorter than the leaves, two from each axil, one-flowered; berry oval, with a hard two-celled nucleus; resembling the third species in the leaves and calyx, but very different in the fruit, and in wanting the five-leaved perianth. Observed at Surinam by Dahlberg. 5. B. *biflora*. Cyrtandra biflora, Forst. gen. 3. n. 1. "Peduncles two-flowered; involucre caducous, inflated; leaves ovate, quite entire." A native of the island of Otaheite. 6. B. *cymosa*. "Peduncles cymed; pedicels with little bractes; leaves ovate, crenate." A native of the island of Tanna.

Propagation and Culture.—These plants grow naturally in the warm parts of America. The seeds should be sown on a hot-bed early in the spring, and the plants, when half an inch high, transplanted each into a small pot filled with light fresh earth, and plunged into a hot-bed of tanner's bark, watered and shaded till they have taken root; afterwards according to the warmth of the season, and of the bed in which they are placed. When the plants have filled these small pots with their roots, they should be shaken out, and their roots trimmed and put into large pots filled with light fresh earth, and plunged again into the hot-bed, where they should have much air in warm weather, and be frequently watered. Thus managed, the plants will thrive in summer, but in winter they must be removed into the stove, and often, but sparingly, watered. In the second year these plants will flower; they sometimes perfect their seeds in this country; but as they will not live in the open air, they must be constantly preserved in the stove. Martyn.

BESONS Rocks, in *Geography*, are two small rocks off the western point of Cornwall, bearing W.S.W. from cape Cornwall, and N.N.E. from the Long ships. Ships may sail within them without danger.

BESORCH, in *Commerce*, a coin of tin, or of some alloyed metal, current at Ormus, at the rate of about $\frac{7}{40}$ parts of a farthing sterling.

BESOS, or Betulus, in *Geography*, a river of Spain in Catalonia, which runs into the sea not far from Barcelona.

BESSAPARA, in *Ancient Geography*, a town of Thrace, situate 12 miles from Philippopolis.

BESSARA, a town of Asia in Assyria, seated near the Tigris. Ptolemy.

BESSARABIA, Budziac, or Boodjak, in *Geography*, is a small country of Turkey in Europe, situate between the north branch of the Danube and the river Dneister, and bounded on the west by Moldavia, on the south by the Danube, on the east by the Black sea, and on the north by Russia. It was anciently the country of the Getæ and Peucini; but it is now inhabited by the independent Tartars, of whom some have fixed habitations in their villages, and others lead a kind of wandering life, subsisting on the flesh of their oxen and horses, and on the milk of mares, and the cheese which is made of it. In their religion, manners, and customs, they resemble the Crim Tartars. When an army is sent to attack them, they retire into inaccessible mountains, on the coast of the Black sea, whence it is impossible to expel them, on account of the morasses and defiles. The chief towns are Bender, Akerman, Kilia, and Ismail. This country, and also Walachia, on which it borders towards the south-west, contain some lakes of considerable extent, as those round Ismail, and that to the east of Surza, which communicates with the Danube, and forms a part of that river.

BESSARION, Cardinal, in *Biography*, was born at Trebisond in 1395, and educated at Constantinople, under some of the most learned Greeks of that period. In the course of his education, he adopted the principles of the Platonic philosophy, and was more confirmed in them by the lectures of George Gemistus Pletho, on whom he attended in the Morea. These principles he combined with his system of Christian theology. Having taken the religious habit of St. Basil, he was soon advanced to the bishopric of Nicæa, and employed by the Greek church to attend on their behalf at the council held under pope Eugenius IV. first at Ferrara, and afterwards at Florence, in 1439; with a view of effecting an union between the Latin and Greek churches. But he incurred the displeasure of the Greeks by inclining to the party of the Latins, and proposing an union of the two nations, to the prejudice of the former, who were required unequivocally to declare that the Roman pontiff was the supreme head of the universal church. Bessarion became unpopular in his own country, nor could he venture to revisit Constantinople; but remaining at Rome, and subscribing the articles of the Latin church, he was recompensed, in 1439, by a cardinal's hat, and he was also created titular patriarch of Constantinople. Having perfected himself in an acquaintance with the Latin language, he was from this time employed by the popes in several concerns of moment. Nicholas V. after naming him to the bishopric, first of Sabina, and afterwards of Frascati, sent him as legate to Bologna, where he resided from the year 1450 to 1455, and contributed to revive and increase the reputation of the university. Upon the death of Nicholas, the cardinals had an intention of advancing him to the papal see; but when they waited upon him with this view, they were prevented from seeing him by one of his attendants, who would not allow him to be disturbed in his studies; upon which Bessarion, when he was informed of the fact, said to him, "Perot, thy incivility has cost thee a hat, and me the tiara." Bessarion was employed by the popes Calixtus III. and Pius II. in negociating the wished-for league against the Turks, and deputed for this purpose to Alphonso, king of Naples, and the emperor Frederic. During the pontificate of Paul II. he lived at Rome, and distinguished himself in the promotion of literature, by opening an academy in his palace for the study of philosophy, and for gaining a critical knowledge of the Greek and Latin languages: nor was he less liberal and active in encouraging every other branch of science, by countenancing with his presence and patronage those assemblies that were frequented by the Greeks and Italians for the purpose of mental improvement. His library, which contained many Greek MSS, is said to have cost him 30,000 crowns; and this he presented, in 1468, to the republic of Venice, where it became the chief foundation of the library of St. Mark. Having received from pope Sixtus IV. the appointment of legate to France for the purpose of reconciling king Lewis XI. and the duke of Burgundy, he paid his first visit to the duke, and thus offended Lewis to such a degree, that he treated him with rudeness, and dismissed him without

without entering on the bufinefs for which he was deputed. This kind of reception affected him fo much, that on his return he fell fick at Turin, and died at Ravenna in 1472. He was regarded as a perfon of unparalleled genius and erudition; and he was the author of many works, both in Greek and Latin, fome of which were printed, and others left in MS. The chief of thefe was his defence of Plato, againft George of Trebifond, in a treatife entitled "In calumniatorem Platonis, lib. iv.," firft printed without a date at Rome in 1470, and re-edited at Venice in 1503 and 1516, folio. In this publication he examines Plato's opinions, particularly with regard to morals, and fhews that they approach much nearer to the doctrines of Chriftianity than thofe of Ariftotle. Others of his printed works are letters, orations, and tranflations of Xenophon's Memorabilia, the metaphyfic of Ariftotle, and that, falfely afcribed to Theophraftus. According to Brucker, thefe tranflations are very obfcure; but Huet commends Beffarion as the model of all good tranflators. Brucker's Hift. Philof. by Enfield, vol. ii. p. 407. Fabr. Bib. Græc. l. v. c. 43. § 9. tom. 10. p. 401.

BESSARIONOVA CAPE, in *Geography*, is the weft point of a bay in the fea of Azof, of which the eaft point is cape Berdinfkaya. N. lat. 46° 35′ E. long. 36° 46′.

BESSA-STADER, or BASSE-STED, a place of Iceland, (N. lat. 64° 6′.) the refidence of the king's prefect. In this place is a woollen manufactory, with a fulling mill belonging to it.

BESSAY, a town of France, in the department of the Allier, and chief place of a canton in the diftrict of Moulins, 8 miles fouth of Moulins.

BESSE, JOHN, in *Biography*, of Peyruffe, in the Rouergue, was educated under M. Chirac, at Montpellier, whofe theory of fermentation he adopted. He then went to Paris, where he publifhed, in 1702, "Recherches analytiques fur la ftructure du corps humain," 8vo. He derives all the functions of the body, and even the formation of the fœtus, from a due mixture of acid and alkali. He does not allow the imagination of the mother to have the power of marking or defiguring the fœtus in utero. The following year he was created doctor of phyfic by the faculty at Paris, and foon after was made phyfician to the queen dowager of Spain. In 1723, he publifhed "Lettre critique, contre l'idee generale de l'œconomie animale, et les obfervations fur la petite verole," in 12mo. In this work, the firft part of which was written to oppofe the principles laid down by Helvetius, he gives an account of a malignant fpecies of fmall-pox, which raged in the year 1716, and fpeaks of the benefit accruing in thefe cafes from bleeding, and adminiftering purges, on the [illegible], a [illegible] approved by Drs. Mead and Friend. He commends the diffection of dead bodies, with the view of difcovering the caufes of difeafes, which he frequently practifed, and mentions his having found 13 calculi in the gall-bladder of a perfon who died of jaundice. For other fmaller pieces by this writer, fee Haller's Bib. Med. Pract. He died, we are told, at Paris, at an advanced age.

BESSE, in *Commerce*, a Perfian copper coin, in value 1½d fterling.

BESSE, in *Geography*, a town of France, and principal place of a diftrict, in the department of the Puy-de-Dôme, 6 leagues fouth of Clermont. The town contains 1913, and the canton 11,016 perfons. Its extent comprehends 445 kiliometres and 12 communes. N. lat. 45° 31′. E. long. 2 52′.—Alfo, a town of France, in the department of the Var, and chief place of a canton in the diftrict of Brignols, 6 miles S. E. of Brignols. The town includes 1578, and the canton 8165 perfons. The territory contains 317½ kiliometres and 7 communes.—Alfo, a town of France, in the department of the Sarte, and chief place of a canton in the diftrict of St. Calais, on the river Braye, 5 miles fouth of St. Calais.

BESSENAY, a town of France, in the department of the Rhone, and the diftrict of Lyon, 4 leagues weft of Lyons.

BESSENBACH, a town of Germany, in the circle of the Lower Rhine, and archbifhopric of Mentz; 6 miles eaft of Afchaffenburg.

BESSERNE, a fmall ifland of Denmark, 2 miles S. E. of Veyeroe.

BESSI, in *Ancient Geography*, a people who inhabited a diftrict of Thrace, near mount Hæmus, called *Beffica*. They lived in huts, and maintained themfelves by plundering their neighbours. They were the moft favage and inhuman of all the Thracians, according to the account given of them by St. Jerom, Paulinus of Nola, Eutropius, and Ovid. Their chief city, Ufcudama, is now known by the name of Adrianople. They lived under their own kings, undifturbed by the neighbouring princes, till the confulate of M. Licinius Lucullus and C. Caffius Varus. Lucullus invaded their country; after a fignal victory took poffeffion of it, and fubjected the whole nation to the Roman laws. The Romans afterwards allowed them to live under their own kings: but Pifo, while he governed Macedon as proconful, having treacherouffy feized Rabocentus, whom Strabo calls prince of the Beffi, caufed him to be publicly beheaded; and this affront fo exafperated the whole nation, that they fhook off the Roman yoke; however, they were vanquifhed in a confiderable battle by Octavius, the father of Auguftus. During the civil wars of Rome, they again attempted to recover their liberty, but were fubdued by the famous M. Brutus, junior. In the reign of Auguftus, one Vologefes, a native of the country and prieft of Bacchus, having, under pretence of religion, affembled a numerous body of people, made himfelf mafter of the whole country, and entering the Cherfonefus, committed moft dreadful ravages; but was at laft overcome by L. Pifo, who obliged the favage inhabitants to lay down their arms, and fubmit to fuch conditions as he was pleafed to impofe. From this time the Beffi continued fubject to the Romans, without making any further attempts to recover their ancient liberty. Eutrop. l. ii. Orof. l. iv. c. 3. Flor. l. iv. c. 12. Sueton. in Octav. Dio Caff. l. xlvii.

BESSIERES, in *Geography*, a town of France, in the department of the Upper Garonne, 5 leagues N. E. of Toulouffe.

BESSIGBEIM, a town of Germany, in the circle of Swabia, and duchy of Wurtemberg, near the conflux of the Ens and Necker, 8 miles fouth of the Heilbron, and 13 north of Stuttgart. The diftrict of the fame name is a good wine country.

BESSIN, the name, before the revolution, of a fmall country of France, in Lower Normandy, near the fea-coaft.

BESSINES, a town of France, in the department of the Upper Vienne, and chief place of a canton in the diftrict of Bellac, fituate in a deep, narrow, rocky valley, 6 leagues north of Limoges. The town contains 2511, and the canton 9372 perfons. Its territory includes 180 kiliometres, and 7 communes.

BESSIS. See BES.

BESSIS *Centefimæ*, denotes two-thirds of centefimal intereft, or ufury at eight per cent.

BESSONIE, LA, in *Geography*, a town of France, in the department of the Tarn, and chief place of a canton in the diftrict of Caftres, 3 leagues N. N. E. of Caftres.

BESSY BELL, a mountain of Ireland, in the county of Tyrone, 10 miles fouth of Strabane.

BESTAAD, a town of Norway, 36 miles N. N. E. of Drontheim.

BESTAGNO, a town of Italy, in the duchy of Montferrat, on the Bormida, 18 miles Eaft of Alba.

BESTAIL, or Bestial, in *Ancient Statutes*, is uſed for all kinds of cattle. 4 Edw. III. c. 3. It has been appropriated more, in former times, particularly to thoſe that were purveyed for the king's proviſion.

BESTARCHA, a dignity in the courts of the emperors of Conſtantinople, ſuppoſed to anſwer to that of the *maſter of the wardrobe* among us.

The word beſtarcha ſeems to have been formed from *veſtarcha*, by a change of the *v* into *b*.

BESTERTZE. See Bistritz.

BESTIARII, among the *Ancient Romans*, thoſe who were hired to combat with beaſts, or thoſe who were expoſed to them, by ſentence of law.

We uſually diſtinguiſh two kinds of beſtiarii: the firſt were thoſe condemned to the beaſts; either as being enemies taken priſoners, or as being ſlaves, and guilty of ſome enormous crime.—Theſe were all expoſed naked, and without defence, to the beaſts; nor did it aught avail to conquer and kill the beaſt, freſh ones being continually let looſe on them, till they were dead. But it ſeldom happened that two were required for the ſame man; on the contrary, one beaſt frequently diſpatched ſeveral men. Cicero mentions a lion, which alone diſpatched two hundred beſtiarii.—Thoſe who ſucceeded the firſt were called εφεδροι, and the laſt εσχατοι; among the Romans, *meridiani*.

The Chriſtians were beſtiarii of this kind, even ſome of them who were Roman citizens; though it was the legal right of ſuch to be exempt from it.

The ſecond kind of beſtiarii, Seneca obſerves, conſiſted of young men, who, to become expert in managing their arms, fought ſometimes againſt beaſts, and ſometimes againſt one another; and of bravoes, who, to ſhew their courage and dexterity, expoſed themſelves to this dangerous combat. Auguſtus encouraged this practice in young men of the firſt rank; Nero expoſed himſelf to it; and it was for the killing beaſts in the amphitheatre, that Commodus acquired the title of the Roman Hercules.

Vigenere to theſe adds two kinds of beſtiarii more: the firſt were thoſe who made a trade of it, and fought for money; the ſecond was where ſeveral beſtiarii, armed, were let looſe at once, againſt a number of beaſts.

BESTOROZIN, or Beszermeny, in *Geography*, a town of Hungary, 8 miles N.N.W. of Debreczin.

BESTRITZA, or Bistricra, a large town of Lower Hungary, on the Wag, with a caſtle facing it, ſeated on a high rock on the oppoſite ſide of the river.

BETA, deriving its name from the form of the letter Βητα, which it has when ſwelled with ſeed, in *Botany*. Lin. gen. 310. Reich. 338. Schreb. 436. Tourn. 286. Gærtn. t. 75. Juſſ. 85. Claſs and order, *pentandria digynia*. Nat. Ord. *Holoraceæ. Atriplices*, Juſſ. Gen. Char. *Cal.* perianth five-leaved, concave, permanent; diviſions ovate-oblong, obtuſe. *Cor.* none. *Stam.* filaments five, ſubulate, oppoſite to the leaves of the calyx, and of the ſame length with them; anthers roundiſh. *Piſt.* germ, in a manner below the receptacle; ſtyles two, very ſhort, erect; ſtigmas acute. *Per.* capſule within the bottom of the calyx, one-celled, deciduous. *Seed* ſingle, kidney-form, compreſſed, involved in the calyx.

Eſſ. Char. *Cal.* five-leaved. *Cor.* none. *Seed* kidney-form, within the ſubſtance of the baſe of the calyx.

Species, 1. B. *vulgaris*, red garden beet. Varieties α. B. rubra vulgaris, Bauh. pin. 118. Raii hiſt. 204. n. 2. Ger. emac. 318. n. 2. Park. theatr. 751. f. 3. Common red beet. β. B. rubra major. Bauh. pin. 118. Blackw. t. 235. Ger. 251. n. 3. emac. 392. B. italica. Park. par. 490. Raii hiſt. 205. Great red beet. γ. B. rubra, radice rapæ, Bauh. pin. 118. Raii hiſt. 204. n. 4.—romana rubra, rapoſa dicta. Park. par. 489. Turnep-rooted red beet. δ. B. lutea major. Bauh. pin. 118. Raii hiſt. 204. n. 5.—ſyriaca. Park. theatr. 752. n. 3. Yellow-rooted beet. ε. B. pallide virens major. Bauh. pin. 118. Green-leaved red beet. "Flowers heaped; leaflets of the calyx toothed at the baſe." This ſpecies has large, thick, ſucculent leaves, generally of a dark red or purple colour. The roots are large and deep red, on which their goodneſs depends; for the larger they grow, the more tender they will be, and the deeper their colour, the more are they eſteemed. A native of the ſea-coaſt of the ſouthern parts of Europe. The variety α. has the leaves ſhorter than in the white beet, more or leſs red, and ſometimes ſo dark, as to be called black beet; its root white. β. has leaves large and red, as is the whole of the plant, as well root as ſtalk, and flowers full of a purple juice, tending to redneſs; the midribs of the leaves are very broad and thick, like the cabbage leaf, and equal in goodneſs when boiled. Gerard ſays, that it grew with him in 1596, to the height of eight cubits, and brought forth its rough ſeeds very plentifully. Theſe, though taken from a plant of one colour, produce plants of many and valuable colours. γ. Stem higher than the common red beet; root thick, within and without of a high blood colour. δ. Leaves paler than thoſe of the white beet, of a greeniſh yellow colour; the root of a fine high yellow, ſweet and well taſted. All theſe are mere ſeminal varieties. The beet is ſubject to change, and to degenerate, at leaſt in our climate. It has been ſuppoſed, that the B. *cicla* is not ſpecifically different from the *vulgaris*, and that both are derived from the *maritima*, cultivated on a rich ſoil, in ſouthern climes. The beet is ſaid to be prejudicial to the ſtomach, and to yield little nouriſhment. Taken in quantity, it tends to looſen the belly. The juice of the root and leaves is ſaid to be a powerful errhine, and to occaſion a copious diſcharge of mucus, without provoking ſneezing. A good ſugar may be obtained from the juice of the freſh roots. This ſpecies was cultivated in 1656 by Mr. John Tradeſcant, jun. 2. B. *cicla*, white garden beet. B. hortenſis. Mill. Dict. n. 2. B. vulgaris, ζ, η. Lin. Spec. 322. B. alba. Ger. 251. n. 1. emac. 318. n. 1. Raii hiſt. 204. B. communis alba. Park. par 489. 1. B. alba vel palleſcens, quæ cicla offic. Bauh. pin. 118. and B. communis viridis *ejuſd.* "Flowers three-fold; leaflets of the calyx unarmed at the baſe." The root of this ſort ſeldom grows larger than a man's thumb; the ſtalks grow erect, and have oblong, ſpear-ſhaped leaves growing cloſe to the ſtalk; the ſpikes of flowers are axillary, long, and have narrow leaves placed between the flowers; the lower leaves are thick and ſucculent, and their footſtalks broad; and for the ſake of theſe it is cultivated. A large variety of this has been lately introduced from abroad, under the titles of "Racine de diſette," "Root of Scarcity," and "Mangel Wurzel." The ancients called the white beet *Cicla*, or rather *Sicla*, by contraction from *Sicula*, Sicilian beet; as we call the Savoy-cabbage, *Savoys*. Mr. Miller mentions three varieties of this, viz. the white, the green, and the Swiſs or chard beet; by the laſt of which he probably intended the ſame as the modern "Mangel Wurzel." He ſays that they vary from one to another in culture, but that they never alter to the firſt or the third. 3. B. *maritima*, ſea-beet. Lin. ſpec. 322. ſyſt. 262. Reich. 623. Hudſ. 108. Wither. 277. Eng. Bot. t. 285. Smith. Flor. Brit. 115. B. ſylveſtris maritima. Bauh. pin. 118. Park. theatr. 750. 2. Raii ſyn. 157. hiſt. 204. Ger. emac. 318. 2. Sea-Beet. Pet. H. Brit. t. 8. f. 9. "Flowers double or twin; ſtalks decumbent; leaflets of the calyx even, not toothed." It differs from the others, according to Linnæus, in flowering the firſt year; in having oblique or vertical leaves; and in the leaflets of the calyx being equal, not toothed; accord-

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ing to Ray, in having a perennial root. This is probably the original parent of all the garden beets. A native of Holland and Great Britain, on the sea-coast, and in salt marshes: it is also found plentifully about Nottingham. It is perennial, and flowers in August. 4. B. *patula*, spreading beet. Ait. hort. kew. i. 315. "Flowers heaped; all the leaves linear-lanceolate; branches divaricated. "Stem short, hardly a foot high, very branching; branches long, divaricate; calycine leaflets at the base, but not toothed." Flowers in August. A native of the island of Madeira. Introduced in 1788. Martyn.

Beta, in *Gardening*, comprehends several different useful esculent roots and culinary herbs of the hardy kind, as the B. *cicla*, or common culinary beet, which has a small, oblong, white root, producing from its crown many large, oblong, succulent leaves, on broad footstalks, and erect branching seed; stems two or three feet high, garnished with close-setting leaves, and long spikes of greenish flowers, which are succeeded by plenty of ripe seed in autumn. The varieties of which are the *common green-leaved beet*; *large white beet*; *chard*, or *great Swiss beet*, having very broad leaves, with thick foot-stalks and ribs. These often vary from one to the other, the seed of one frequently producing some of each sort, though by proper care in saving it, the difference may be preserved.

The B. *major*, or great *German beet*, commonly called *mangel wurzel*, has a large, long, reddish, or sometimes whitish red root; and very large, oblong, thick, succulent leaves. The varieties of which are—the dark-green leaved—light green-leaved—red-veined leaved. This species has been very much recommended, on account of its vast growth and great utility both in its root and leaves; experience has, however, shewn the former to have little claim to esteem for domestic uses, as it is of an insipid and unpalatable taste; but the leaves being large and succulent, are good to use occasionally, in the manner of common beet, and particularly to boil as spinach, or put into soups; and the stalks and midrib of the leaf to be stewed and eaten as asparagus. Dr. Lettsom, who took much pains to introduce the mangel wurzel, informs us, that on his own land, which was not favourable to its growth, the roots, upon an average, weighed full ten pounds; and if the leaves were calculated at half that weight, the whole product would be fifteen pounds of nutritious aliment, upon every square of 18 inches.

The B. *rubra*, or red beet, has a large, red, eatable root, crowned by many large, oblong, reddish-dark-purple leaves; and when it shoots, sends up erect stalks and branches, terminated by long spikes, of flowers and seed. The varieties of which are *common red beet*, with a large, longish, dark-red root; turnep-rooted red beet, with a short, large, dark-red root; with a red root and green leaves; with a yellow root; but the first of these varieties is mostly preferred for general culture, though the second is equally good, but the root is not of so good a shape as that of the former; the other two are not proper to cultivate for a crop.

Methods of Culture of the common Beet. All the varieties are propagated by seed sown annually in the spring, in February, March, or April, in the places where the plants are to remain, in order to attain proper growth for use in summer and autumn. They will continue till spring, when they shoot for seed. If the sowing be neglected in the spring, some seed may occasionally be sown in summer, any time till the beginning of August, in a moist situation, but the spring is the most eligible season for obtaining a good crop. They may be sown in any common soil, allowing each sort a separate plat or bed. The ground should be dug one spade-deep in the usual way; the seed then either sown broad-cast on the surface, and raked in; or, as it is a large seed, shallow drills may be drawn, at the distance of six inches for the common green and white varieties, but almost double that for the large white and chard beet, sowing the seeds thinly, and raking the earth over them, about an inch deep; then trimming the surface smooth. The plants come up in about a month, and when they have leaves an inch or two broad, they should be hoed, to thin and destroy weeds, cutting out the common green and white sorts to about six inches distance; but the chard beet should be allowed ten or twelve inches room every way, that their large succulent leaves may have full scope to spread. They are commonly in perfection in June and July, and it is necessary to observe, in gathering them, to take the large outward leaves, the others coming in for use in their turn, an abundant successive supply rising from the root. A succession crop must be raised every year from seed in the spring, &c. for although the same crop might be occasionally continued two years, by cutting down the seed-stems of the year-old plants, according as they advance in spring and summer; the roots abiding, produce a supply of leaves, but which are much inferior in substance to those of the annually-raised seedling plants; it is better, therefore, to sow every year, in order to have a good production. The large white and great chard beet are in much esteem, for the stalks and ribs of the large leaves, being divested of the leafy part and peeled, are great improvers of soup, and useful also for stewing, and to be dressed and eaten like asparagus, and the leaves themselves are fine pot-herbs; for all which uses, the several varieties of this species may, as has been seen, be obtained almost the year round.

The Mangel Wurzel Beet. This sort has generally been reckoned a variety of the B. *cicla*; but some botanists have made it a distinct species, under the title of B. *altissima*. It is raised from seed sown annually in the spring, the same as the other sorts, in any open situation, but should generally be sown thinner, either in drills one or two feet asunder, or broad-cast on the general surface, and raked in; and when the plants are come up one, two, or three inches in growth, they should be thinned to a proportionable distance, to give room for the full expansion of their large leaves. Some, however, advise transplanting, when the young plants are of two or three inches in growth, setting them in rows one or two feet asunder; this seems, however, unnecessary; especially, as they have long, downright, tap roots, which generally are the most successful when they remain where sown; the method may, nevertheless, be practised occasionally by way of experiment. The plants generally continue to produce leaves the greatest part of the year, and the roots attain perfection for use in autumn and winter, till spring; but when it is required to have a principal crop of full-sized roots, some should be allotted for that purpose, without cutting or gathering the leaves. This sort is valued most generally for its leaves, for which it principally merits culture in the gardens; as we cannot much recommend the root, which, although it grows very large, sometimes of several pounds weight, is greatly inferior in use, both to the red beet, and that of most others of our esculent roots, for any domestic purposes. It is sometimes dressed in the manner of carrots and parsneps, &c. sliced, and served up with butter, but is generally of a mawkish, unpalatable relish.

The leaves, however, which, if the plants have large scope of room, grow twelve or fifteen inches broad or more, and of proportionable length, are exceedingly good, when young, to use as the common white and green beet; and the young thick, fleshy stalks, divested of the leafy part, peeled or scraped,

ſcraped, then boiled and ſerved up with butter, are tender and agreeably taſted; alſo the leaves to boil occaſionally as ſpinach and other ſmall greens; and of which the root is remarkably productive in quick growth, to afford frequent ſucceſſional gatherings all ſummer and autumn, either cutting them off cloſe, or gathering only the larger outward ones, as in either method they ſoon ſhoot up again in plentiful ſucceſſion.

The Red Beet. This is raiſed from ſeed ſown annually in March or April, in the place where the plants are to remain, being careful to procure that of the beſt dark red ſort. It ſhould be allowed a light, rich, deep ſoil, in an open expoſure. The market gardeners often ſow this ſort thinly among their crops of onions, carrots, &c. that are to be drawn off while young; ſo that when theſe are gone, the beet commences a full crop.

It is, however, a better practice to ſow the principal crop ſeparate. The ground ſhould be dug one ſpade deep at leaſt, and well broken, the ſeed ſown directly, which may either be broad-caſt on the ſurface, or raked well into the ground; or, as obſerved of the firſt ſort, in drills drawn an inch deep, and at the diſtance of ten or twelve inches; or you may dot or prick it, as is often practiſed, with a blunt dibber, in lines at the above diſtance, making the holes an inch deep, and eight or ten aſunder in the rows, dropping two or three ſeeds in each hole, though only one good plant ſhould be left in each place. In May or June, when the plants have leaves an inch or two broad, they require thinning and cleaning from weeds, which may be performed either by hand-weeding or ſmall hoeing; the latter is the moſt expeditious for large crops, and it looſens the ſurface of the earth, to the great advantage of the young plants; carefully eradicate all weeds, and thin the plants to ten or twelve inches diſtance. Some of the roots will be fit to take up for uſe about the end of Auguſt, though they will not attain full perfection until October. In November, a quantity of the roots ſhould be taken up, their tops trimmed off, not too cloſe, and then laid in ſand or dry earth, under ſhelter, to be ready for winter uſe.

This ſort of beet is highly valued for its large red root, which in the common variety, often grows twelve or fifteen inches long, and three or four inches thick or more; but that of the turnep-rooted ſort is much ſhorter, and generally thicker, and of equal goodneſs in every reſpect for uſe; and in both of which, thoſe that are of the largeſt growth and darkeſt red colour, are the moſt valuable: theſe roots being tender, ſweet, and palatable, are boiled, ſliced, and eaten cold, &c. are alſo ſliced and ſcraped in ſallads, both as an eatable ingredient, and by way of garniſh; ſlices of the root are alſo in requeſt not only as garniſh to diſhes, but as a pickle: the other varieties are never cultivated for any principal crop.

Saving of Seed. In order to ſave ſeed from any of the varieties, either mark ſome of the beſt plants in ſpring, to be left to run up, or tranſplant ſome of them in February or March into a convenient place, to have ſhelter from winds; they ſhoot up ſtalks in May; in June they muſt be ſupported with ſtakes; and the ſeed will ripen in September.

That a great quantity of ſugar might be obtained from white beet, has been long known. The famous chemiſt Margraaf made ſome experiments, half a century ago (publiſhed in the year 1747) for determining the quantity of ſugar contained in various European plants. He found that the white beet produced a much greater quantity than any of the other plants. The beet has of late been much cultivated, particularly in Germany, with a view to the ſugar that is obtained from the root. M. Achard of Berlin, firſt introduced this ſubject into general notice, and recommended that the ſugar ſhould be procured by boiling the beet-roots, when taken out of the earth; that they be ſliced when cold; that afterwards the ſaccharine juice be preſſed out; and that it be filtered, evaporated, and, after evaporation, the ſugar be procured by cryſtallization and preſſure. He has publiſhed his method at full length, in "Ausfuhrliche Beſchreiburg," Berlin 1799. 8vo. He lays much ſtreſs on the mode of culture, and obſerves, that crude ſugar can be produced at about three-pence a pound. His peculiar mode of culture conſiſts chiefly in planting the ſeeds at a certain diſtance from each other, and in not tranſplanting the roots. M. Achard reckons three varieties of the beet-root; but he prefers that which has the ſkin of a reddiſh colour, and the fleſh white. The kinds of beets which have been uſed for this purpoſe, are varieties of the B. *vulgaris*. Mr. John Taylor of Leipſig has given a particular account of the method of cultivating the common beet, and of preparing ſugar from its root, in a letter addreſſed to his father, the ſecretary of the ſociety for the Encouragement of Arts, &c. and publiſhed in the 18th volume of their Tranſactions. He obſerves, that the ſoil ſhould be a good black earth, not too moiſt; and that it ſhould be prepared, like that deſigned for cabbages, by dunging it in autumn with ſhort rotten dung, and ploughing it, and by turning it again in ſpring, and ploughing it a third time to a greater depth than before. After the third ploughing, ſays M. Achard, it ſhould be carefully harrowed, to render it ſmooth and even, and to brake all the lumps of earth which may happen to be in it. The ſeeds are uſually placed at the diſtance of from 12 to 18 inches from one another, from 9 to 12 inches according to M. Achard, and at the depth of one inch in the earth. One ſeed is laid in each hole, and immediately covered with earth. In four or five weeks time the ground muſt be weeded, and afterwards hoed. Some prefer tranſplanting the roots, to ſowing the ſeed in the ground where the plants are intended to remain. M. Achard forbids all tranſplanting; and one of his reaſons for this prohibition is, that the lower part or points of the roots are liable to be thus broken off, which part, he ſays, gives more ſugar than the upper part. After they have been ſome time in the ground, the earth ſhould be looſened with a hoe, and the weeds deſtroyed. The method invented by profeſſor Gottling for ſeparating the ſugar from the beet-roots, is eaſily practicable, and adapted to this country. It is as follows:—He recommends the taking of the beet-roots out of the ground from the middle of September to the middle of October, that the weather may be favourable for drying them, which ſhould be done carefully, leſt, as M. Achard obſerves, they ſhould be damaged, and any of the juice which oozes out be loſt; and waſhing them as ſpeedily as poſſible from the earth that adheres to them, and cutting off their ſmall fibres as well as ſuch part of the root as had ariſen, whilſt they were growing, above the ſurface of the earth. The roots are afterwards wiped with a cloth, and laid upon a dry floor; the heads are cut off and given to the cattle; and the roots are ſliced lengthways, along the middle, each half being cut again into ſlices, and looſely hung, not too near each other, leſt they ſhould ſpoil, on ſtrong thread, ſuſpended on nails, in an airy chamber or place ſecure from the rain. In the courſe of two or three weeks, with proper attention, they will be ſufficiently dry for the extraction of their ſugar. If the drying ſeaſon is far advanced, or a froſt expected, the beet-roots ſhould not be expoſed to the outward air; they ſhould be dried in the kitchen or warm rooms, either on ſtrings or netted frames, reſembling the flakes uſed in Yorkſhire for drying oat-cakes; or they may be dried in ſtove-rooms by artificial

artificial heat, taking care to prevent their being ſmoaked or burnt. If an opportunity does not occur for ſlicing the roots immediately after being taken out of the earth, they ſhould be placed in cellars, and covered with ſtraw, or put into holes in dry ſandy earth, and preſerved till they are wanted.

M. Achard ſays, that after the roots are waſhed and cleaned, they ſhould be ſliced by means of a machine, or ground in a ſort of mill, conſiſting of a cylinder furniſhed with points, like a raſp, which turns round in a box. The roots are put in this box, and preſſed, by means of a weight againſt the cylinder, which, upon being turned round, ſoon reduces them to a kind of pulp. When the beet-roots are dry, they are ready for the extraction of their ſugar. For this purpoſe, three wooden tubs, wide, but not deep, made of oak, aſh, or willow, ſhould be provided, or, for family uſe, earthen mugs. Near the bottom of the tubs, cocks or ſpiggots ſhould be fixed, and the tubs ſhould be placed in a cool ſituation of about 52° of Fahrenheit, upon a ſtillage near each other, and at ſuch a height from the ground that ſmaller veſſels may ſtand below them for receiving the liquor when drawn off, and clear water ſhould be at hand ſo as to be pumped into the higher veſſels. When the beet-roots, thoroughly dried, have been ſifted, ſo as to be free from the duſt and looſe fibres, one of the higher tubs ſhould be half filled with them, and clear cold water poured upon them, about one-third in height above the roots. In this ſtate they ſhould remain for about three hours, ſtirring them at different times with a wooden paddle. At the end of this time, the ſame number of clean dried roots ſhould be put into the ſecond tub; and the ſweet liquor drawn from the firſt tub into the veſſel under it, ſhould be poured upon the roots in the ſecond; and the firſt tub ſhould be ſupplied with freſh water in ſuch quantity as juſt to cover the roots, and the tubs ſhould remain three hours more, and the roots be repeatedly ſtirred, as before. The liquor which had been poured from the firſt tub to the ſecond, will be now much abſorbed by the roots in the latter tub. After ſtanding again for three hours, the ſweet liquor from the ſecond tub muſt be drawn off, which, if the roots were of the red and white ſort, will be of an agreeable red colour. It muſt then be paſſed through a ſieve, or filtered through a flannel, and then be reſerved for boiling down for ſugar. After this, draw the liquor from the firſt tub, pour it on the ſecond, and put into the firſt tub more freſh water, and let it ſtand three hours longer. Then put into the third tub the uſual quantity of dry roots, and pour on them the liquor drawn from the ſecond tub; remove the liquor from the firſt to the ſecond; and the roots in the firſt tub being now deprived of their ſaccharine matter, may be uſed for feeding hogs or cattle. After three hours more, the liquor ſhould be drawn from the third tub and filtered as before, and then boiled down for ſugar. Then draw off the liquor of the ſecond veſſel, and pour it into the third; add freſh water to the ſecond veſſel, and let it remain three hours more, the roots being occaſionally ſtirred. During this time cleanſe out the firſt tub, and add freſh roots, as before. After three hours, draw the liquor from the third tub, and pour it upon the freſh roots in the firſt; then draw the liquor from the ſecond tub, and pour it on the third. The roots of the ſecond tub will be now exhauſted, and may be given to the cattle. After three hours draw off the liquor from the firſt tub, filter it, and it will be ready for boiling down. On the contents of the firſt, pour the liquor of the third, and put freſh water in the third tub; let it remain three hours, and ſtirred as uſual; during which time clean out the ſecond tub, and let the roots be given to the cattle. In the ſecond tub place again freſh roots; and proceed by extracting the ſaccharine matter, as before; and continue the operation, till all the dried roots have been thus freed from their ſugar. By this management, the liquor becomes more charged with ſaccharine matter, than when the juice is preſſed out of the roots, and a conſiderable quantity of fuel is ſpared. The roots from which the liquor has been extracted will have ſwelled much in the operation, and have loſt their ſweetneſs; their farinaceous reſiduum will, however, afford good food for cattle. Whenever there is a ſufficient quantity of dried roots ready, the proceſs of extracting the ſaccharine liquor ſhould be continued day and night, as it is not proper to let the liquor remain longer than three, or at moſt four hours, before you boil it, leſt a diſſolution of the mucilaginous particles of the roots ſhould take place. If it be not convenient to boil down all the ſaccharine liquor at once to a ſtate of cryſtallization, yet it ſhould be daily boiled down to the conſiſtence of a ſyrup, in order to prevent its fermentation. In boiling the liquor, the ſcum that ariſes ſhould be carefully taken off.

The proceſs of boiling, cryſtallizing, &c. the beet ſugars is as follows. Firſt boil the extracted ſaccharine liquors down to the conſiſtence of a ſyrup; then put it into a copper, of which one-third at leaſt is empty, and let it boil away by a moderate fire, until a phial, which holds one ounce of water, will contain eleven drams of the ſyrup, or until the ſyrup pours ſomewhat broad from the ladle. The ſcum or froth ſhould be taken off as it ariſes. When the ſyrup is arrived at the ſtate above mentioned, by gentle boiling, the fire muſt be removed from underneath the copper, and the ſyrup gradually run through a clean woollen cloth, placed over a wooden or ſtone veſſel. The ſyrup muſt not cool too much before this filtration, or elſe it becomes ropy. When the filtered ſyrup is ſomewhat cool, it ſhould be laded into ſhallow wooden or ſtone veſſels, to cryſtallize; for this purpoſe, ſhallow earthen veſſels, ſuch as are uſed to produce cream, or veſſels made of tin, are proper. Theſe veſſels, filled with ſyrup, muſt be placed in a room heated to about 68° of Fahrenheit, and care muſt be taken to keep them free from flies and duſt. If the ſyrup has been of a proper conſiſtence, cryſtals will ſoon begin to form at the bottom of the veſſels; and in an interval of 18 or 21 days the cryſtallization will be completed. The maſs muſt then be put into a ſtrong linen ſack, well ſecured, and placed under a preſs, to ſqueeze out the liquid from the ſugar which remains in the bag. The liquid matter may be ſet to cryſtallize a ſecond or third time, and will yield ſugar of a coarſer quality. A cheeſe-preſs, or long lever, will ſerve for the purpoſe of preſſure. The ſugar firſt obtained, may be rendered purer by mixing with it a ſmall quantity of clear ſpring water, and placing it again under the preſs; the coloured ſyrup will then run out, and leave the ſugar in the bag in a much purer ſtate than before. By repeating the operation, it is ſo far improved, that, when dried and rubbed, it becomes a fine white powder ſugar. The ſeparated ſyrups ſhould be again carefully boiled, and more ſugar will be obtained from them by cryſtallization. If the ſugar procured by the firſt preſſure be diſſolved in as much clear water as will form a ſyrup, and placed again in a warm room to cryſtallize, it will yield a much purer and harder ſugar: the ſyrup may then be ſeparated without preſſure from the ſugar, merely by inclining the veſſel, and allowing the ſyrup to run off from the cryſtals. All the ſyrups thus prepared, are fit for family uſe, and are much ſuperior in taſte to thoſe prepared from the preſſure of the raw or boiled roots. The remaining thick ſyrups may be uſed as treacle or molaſſes, and will ſerve to diſtil ſorrum or ſpirits. From the experiments of

of professor Lampadius of Freyberg, near Dresden, it appears, that beet-roots contain water, fibrous matter, sugar, mucilage, glair, starch, colouring matter, scented matter, and a bitter substance. The water is in the proportion of from one-half to two-thirds of the weight of the roots; the fibrous matter of the roots differs, and it is considerably more in poor than in rich land; the saccharine particles vary from two to five per cent.; the mucilage is from three to five per cent.; and the glair, or matter resembling white of egg, is about one per cent.; the starch is in very small quantity, being only about two or three ounces in a hundred weight; the colouring matter undergoes several changes by exposure to the air, as yellowish, brown, and red, and may be precipitated by acetite of lead; the scented matter is volatile, rising in distillation of the root with water, combining closely with spirits of wine, and occasioning a peculiar contraction in the organs of taste. By boiling the beet-roots, the smell and taste are very much lessened. The bitter substance is soluble in water, and remains behind in the first syrup after the crystallization of the sugar. From other experiments of the same professor, it appears, that 11lbs. of beet-roots, the beta cicla of Linnæus, or white English beet, washed, peeled, cleaned, and then grated, gave a mass which weighed 87 pounds; out of which were pressed 41½ pounds of juice, which was boiled with 20½ ounces of charcoal powder. This, when filtered and evaporated down until crystallized, produced full five pounds of a brownish yellow-grained sugar, and also five ounces of brown syrup. The above brown sugar, after being dissolved in six pounds of lime-water, mixed with one pound of blood, then boiled, filtered, and afterwards evaporated, yielded four pounds 5½ ounces of purified brown sugar, and 6½ ounces of syrup. The four pounds 5½ ounces of sugar, thus prepared, were again dissolved in six pounds of lime-water, mixed with one pound of milk, and then boiled for a quarter of an hour; during the boiling, a small quantity of white wine vinegar, and a little more milk, were added; the saccharine matter was filtered, and treated as before; the product was four pounds of well-grained white powder sugar. The residuum after pressure, the brown syrups of the two first processes, and the remains of the filtrations, weighed, when collected, 40 pounds; they were mixed with one quart of yeast, and 80 quarts of water, heated to 112° of Fahrenheit's, and after fermenting 48 hours, were distilled. They furnished, at the first distillation, 15 quarts of weak spirit, which, on a second distillation, gave eight quarts of a better; from which, when rectified, were produced 3½ quarts of spirits resembling rum. From the result of this series of experiments it appeared, that after paying the farmer for the roots, and discharging all incidental expences whatever, a profit was yielded of nearly cent. per cent. on valuing the four pounds of white powder sugar at one shilling per pound, and the three quarts and a half of rum at one shilling per quart. The produce of beet-roots and their quality for yielding sugar, have, however, been variable; and of course the profit accruing from them. From M. Achard's account we learn, that 24 measures of roots, each of which weighs about 90 pounds, (in all 2160 pounds) and costs about 6d. English, produce 100 pounds of raw sugar; that is, 20 pounds of roots produce nearly one pound of sugar. One hundred pounds of raw sugar give 55 pounds of refined sugar, and 25 pounds of molasses. Another statement informs us, that 14 pounds of raw sugar gave 1¾ pound of lump-sugar, 1¾ pound of white powder sugar, and 1¾ of darker-coloured powder sugar, and eight pounds of brown syrup; from which more sugar might have been obtained. It is computed, in M. Achard's account, that a German square mile of land, (that is, 16 square miles, English), properly cultivated, would produce white beet sufficient to furnish the whole Prussian dominions with sugar.

BETANCOS, Betanzos, or Bitanze, in *Geography*, a town of Spain, in Galicia, 3 leagues from Corunna, 9 from Compostella, and 7 from Ferrol. It has a good harbour in the mouth of the river Mandeo. N. lat. 43° 15′. W. long. 7° 56′.

BETEL, in *Botany*, an Indian plant, in great use and esteem throughout the East, where it makes a considerable article of commerce. See Piper.

The betel bears some resemblance to the pepper-tree. It grows like ivy, and twists round other trees. Its leaves are long and sharp-pointed, but broad towards the stalk, and of a pale green colour. They are like those of ivy, only softer, and full of red juice, which, among the Orientals, is reputed of wonderful virtue for fortifying the teeth, and rendering the breath sweet. The Indians are continually chewing these leaves, which renders their lips so red, and teeth black, a colour by them vastly preferred to the whiteness affected by the Europeans.

The consumption of betel leaves is incredible; no body, rich or poor, being without their box of betel, which they present to each other by way of civility, as we do snuff. In many places they chew the areca nut, either alone or mixt with the betel leaf and lime, and the leaves of this plant are sometimes chewed alone; but they are too sharp, and usually injure the teeth, and it is not uncommon to find men of 25 wholly toothless in this part of the world, merely from their having chewed this plant to an excessive degree. The prepared betel is a very common present among the poorer sort; and on taking leave of a friend, it is always the custom to make him a present of a purse of the leaves prepared for use. When the poorer sort are to appear before the rich, they always chew a large quantity of betel to give them a sweet breath; and the women, on certain occasions, never fail to take largely of it as a provocative. On all visits, the company is regaled with prepared betel. The principal time of using it is after dinner, at which time, they say, it prevents sickness at the stomach; and they never abstain from it, except on the solemn occasions of the funerals of their relations, and their days of fasting. Moderately used, it is said to strengthen the gums, corroborate the heart and stomach, discuss flatulencies, purge both the stomach and brain, and prevent the scurvy. If chewed after breakfast it makes the breath sweet for the whole dry. The Portuguese women are as fond of the betel as the Indians themselves, and cannot live a day without it. It is said, however, that few Europeans can accustom themselves to the use of it. On many occasions it produces sickness, and sometimes intoxication, of no long continuance. The Chinese also use the leaves of betel, covered with quicklime, and wrapped round the nut areca, which in shape much resembles a nutmeg. They chew these leaves continually, and pretend that they strengthen the gums, comfort the brain, expel bile, nourish the glands of the throat, and serve as a preservative against the asthma; a disease which, from the heat of the climate, is very common in the southern provinces. They carry betel and areca (see Areca) in boxes, and present it when they meet one another.

BETELGEULE, or Bedelgaeze, in *Astronomy*, a fixed star of the first magnitude in Orion's hind shoulder.

BETESKOE, in *Geography*, a town of Siberia, on the west side of the Irtish, 230 miles S.E. of Tobolsk.

BETH,

BETH, in *Literary History*, makes the title of a multitude of books in the Hebrew language; *e. gr.* "beth avoth," or, the house of the fathers; "beth Elohim," or, the house of God; "beth Israel," or, the house of Israel, &c.

BETHABARA, i. e. *the House of Passage*, in *Ancient Geography*, is supposed by many to be the place at which men passed over Jordan, over against Jericho, at the common ford of this river where the Israelites passed it under Joshua. Ch. iii. 16. Lightfoot refers it to the passage at Scythopolis, out of the precincts of Judæa, where the Jews dwelt among the Syro-Græcians, over against Galilee. Cellarius places it between these two, observing that there were many passages over Jordan. At this place, beyond Jordan, John is said to have baptized. Chap. i. 28. Origen found, as he tells us, in almost all his MSS., or, if we may judge from what follows, in every one of them, without exception, this verse thus written, "These things were done in Bethany beyond Jordan, where John was baptizing." But he rejects this reading for the following reason: "As I have been in that country, in order to trace the footsteps of Christ and his apostles, I am persuaded that we ought not to read Bethany in this passage, but Bethabara. For Bethany, as the evangelist himself relates, was the birthplace of Lazarus, Martha, and Mary, and only 15 stadia from Jerusalem; but the Jordan was at least, to speak in round numbers, 190 stadia from that city. Nor is there any city whatsoever of the name of Bethany near to that river. But there is a city of the name of Bethabara on the banks of the Jordan, where, it is said, John baptized." To this alteration it has been objected, that Origen grounds the reading, which he has substituted for Bethany, on no other authority than the relation of such persons as conduct travellers to the places in Palestine, which are mentioned in the sacred writings. These persons either had no inclination to conduct Origen to the Bethany, which lay on the other side of the Jordan, as the journey might have been attended with danger, on account of the tribes of wandering Arabs, who infest that country; or they were wholly ignorant of the place. Not to lose, therefore, their profits arising from conducting strangers, they shewed Bethabara to Origen, as the place where John baptized, and the learned father was credulous enough to believe them. Besides, if the text itself be examined, Origen's objections to the common reading will vanish. He says, that Bethany lay near to Jerusalem, and therefore at a distance from the Jordan. But it may be asked, whether there was not more than one city of that name, and whether we must necessarily suppose, that the city in question was the place where Lazarus resided. It appears, even from the expression used by St. John, that, whether we read Bethany, or Bethabara, there was more than one city of the name, which he mentioned. St. John mentions a circumstance by way of distinguishing it, and when he speaks of Bethany beyond Jordan, we are led to suppose, that there were two cities of that name, and that the city which he meant was different from that which was situate on the mount of Olives. But Origen says, that there was no town of the name of Bethany on any part of the Jordan. To this it might be replied, that Origen hardly visited all the towns on the bank of the Jordan, as he probably took the route pointed out by his guides, or that the wars between the Jews and the Romans had so desolated, or altered the face of the country, that many towns might have existed in the time of John the Baptist, of which no traces remained in the days of Origen. But this mode of reply is needless, because the evangelist uses a very indeterminate expression, when he says, that the place, where John baptized, was on the other side of the Jordan; an expression which by no means implies that the town lay on the banks of that river: for it might have been situated either on the Jabbok, or on some other stream considerably to the eastward, where John had a sufficient supply of water for the purpose of baptizing. The alteration, therefore, made by Origen, and which upon his authority, and that of Chrysostom and Epiphanius, is introduced into our copies, was wholly without foundation. See Michaelis's Introd. to the N. T. by Marsh, vol. ii. p. 400.

BETHABARA, in *Geography*, the first settlement of the Moravians in America, in the lands of Wachovia, in North Carolina, begun in 1753, 6 miles N. of Salem, situate on the west side of Grassy creek, which unites with the Gargales, and several others, and falls into the Yadkin, and containing a church of the United Brethren, and about 50 dwelling houses.

BETH-ACHARA, or BETH-HACCERIM, (Jer. vi. 1.) i. e. *house of the vineyard*, a city seated on an eminence, between Jerusalem and Tekoa. See Nehem. iii. 14.

BETHAGLA, or BETH-HAGLA, a town of the tribe of Benjamin, (Josh. xviii. 21.) on the northern boundary of the tribe of Judah. In the time of Jerome and Eusebius there was a village in this situation of the name of Agla, distant 10 miles from Eleutheropolis, towards Gaza.

BETHA-GABRIS, now BAIT-DJIBRIM, a village of Syria, about ¾ of a league to the south of El-Tell; situated between Jerusalem and Ascalon.

BETH-ANATH, *House of a Song*, of *an Answer*, or *of Affliction*, a city of Naphtali. Josh. xix. 38.

BETHANO, CAPE, in *Geography*, lies on the coast of Chinan, or Quinan, off which is Pulo, or Island Canton, which is about 9 or 10 miles from the coast. N. lat. 16°. E. long. 108° 30′.

BETHANY, in *Ancient Geography*, a village at the foot of the mount of Olives, east of Jerusalem, in the way to Jericho. It took its name from a part of ground so called from "Athene," which signifies the dates of palm-trees, which grew there plentifully. The town of Bethany, where Lazarus and his sisters dwelt (John xi. 1.) and where he was raised from the dead, was 15 furlongs, or about 2 miles distant from Jerusalem (John xi. 18.); but the district, or tract of ground, that bore that name, reached within 8 furlongs from Jerusalem, it being only a sabbath-day's journey from it (John xxiv. 50. Acts i. 12.); and then commenced the tract called "Bethphage," from the "phagi," *i. e.* the green figs which grow upon it, extending so near to Jerusalem, that the outermost street within the walls was called by that name. A charge of self-contradiction has been alleged against the evangelist Luke, from the passage above cited. In the Gospel he tells us, that Jesus ascended into heaven from Bethany, and in the Acts of the Apostles, of which he is the reputed author, he informs us, that he ascended from Mount Olivet. This charge is founded on an ignorance of ancient geography, or must proceed from an unwarrantable prejudice against Christianity; because Bethany, as we have above observed, was not only the name of a town, but of a district of Mount Olivet adjoining to the town. See BETHABARA.

BETHANY, or *Bethania*, in *Geography*, a Moravian settlement and post town of America, in the lands of Wachovia, in North Carolina, begun in 1760, 9 miles N.W. of Salem; containing about 60 houses and a church.

BETH-ARABAH, in *Ancient Geography*, a city of Judah (Josh. xv. 6.), afterwards given to Benjamin (Josh. xviii. 22.)

BETHARAMPHTHA, a town of Galilee, on the right bank

bank of the Jordan, on the weſtern ſide of the lake Genneſareth, at the influx of the Jordan into that lake. Lightfoot places it on the left bank of the Jordan in Peræa. It was fortified and ornamented by Herod the tetrarch, and called "Julias," in honour of Julia, the daughter of Auguſtus, and wife of Tiberius. See BETHSAIDA.

BETHARAN, or BETHARA, a town of the Peræa beyond Jordan, called alſo by the Syrians "Betharamphtha," and by Herod "Libias," or "Livias," in honour of Livia, the wife of Auguſtus. Joſephus calls it Julias, and confounds it with the Betharamphtha of the preceding article: but it lay more to the ſouth, nearly, according to Ptolemy, in the ſame latitude with Jeruſalem, in the vicinity of the Dead ſea, and of the mountains Abarim, Nebo, and Piſgah, and of the city Heſhbon.

BETHAVEN, *the Houſe of Iniquity*, a name given to "Bethel," by way of deriſion, after the introduction of idolatry into it by Jeroboam. (Hoſea iv. 15. x. 5.) Bethaven was alſo the name of a diſtinct town near Bethel, and ſouth-eaſt of it, belonging to the tribe of Benjamin. Joſh. vii. 2. xviii. 12. 1 Sam. xiii. 5.

BETH-BASI, a city of Judah, fortified by the two Maccabees, Simon and Jonathan. 1 Maccab. ix. 62. 64.

BETH-DAGON, a city of Aſher (Joſh. xix. 27.)—Alſo, a city of Judah (Joſh. xv. 51.) ſo called, becauſe it had probably a temple of Dagon, before the Iſraelites took poſſeſſion of it.

BETHEL, *the Houſe of God*, a name given to that town, which was before called Luz, on account of Jacob's viſion. (Gen. xxviii. 19.) They ſeem, however, to be diſtinguiſhed in Joſhua xvi. 2. though they were contiguous places; and the name Luz might probably be loſt in that of Bethel. It was a city of Samaria, on the confines of the tribes of Benjamin and Ephraim. Euſebius ſays, that it was 12 miles from Jeruſalem in the way to Sichem. It obtained among the prophets the name of Bethaven, on account of its idolatry.

The Mahometans believe their temple of Mecca to be founded on the ſtone, on which the patriarch Jacob ſlept at Bethel, and hold it in great veneration. Some have ſuppoſed that the ſuperſtitious reſpect manifeſted by the ancients to their Bætyli, or ſtones anointed and conſecrated to great men, after their death, derived its origin from Jacob's pouring oil on the ſtone of Bethel. See BÆTYLOS.

BETHEL, in *Geography*, a ſmall Moravian ſettlement in America, on the Swetara river, in Pennſylvania, 14 miles from Mount Joy.—A townſhip in Dauphin county.—Alſo, a townſhip in Windſor county, Vermont, containing 473 inhabitants, N.N.W. of, and bounded by Stockbridge, and about 67 miles N.N. eaſterly of Bennington. Hence riſes a ſmall branch of White-river.—Alſo, a townſhip in Delaware county, Pennſylvania.

BETHENCOURT, JOHN DE, in *Biography*, a Norman baron, in the beginning of the 15th century, obtained a grant from Henry III. of Caſtile, of the Canary iſlands, erected into a kingdom in 1344, by pope Clement VI. Having viſited theſe iſlands in 1402, Bethencourt returned to them, and by aſſiſtance from Henry, conquered them, held them under the title of king, as a fief of the crown of Caſtile, and tranſmitted the poſſeſſion of them to his family for ſome generations. His poſterity ſettled in Spain. Although his conqueſt of theſe iſlands was not complete, Bethencourt is reckoned the firſt Chriſtian who ſubdued the Canary iſles, which before his time had been occaſionally viſited by freebooters. Robertſon's Hiſt. Amer. vol. i. p. 54.

BETHENCOURT, JAMES DE, phyſician at Rouen, where he practiſed with much reputation, towards the end of the 15th and the beginning of the 16th centuries, is now only known by his treatiſe on the venereal diſeaſe, publiſhed in the year 1527, under the ſingular title of "Nova Penitentialis Quadrageſima, nec non Purgatorium, in Morbum Gallicum, ſeu Venereum, una cum Dialogo aquæ argenti, et ligni guiaci luctantium ſuper dicti morbi prelatura. Opus fructiferum." Paris, 8vo. By his penitence, he means the ſtrict regimen enjoined thoſe who underwent the guiacum, or ſweating proceſs, for the cure of the lues, and by the purgatory, the pains and torments endured while under the ſalivation by mercury, for the ſame purpoſe. Though he treats of the method of curing by the guiacums, as well as that of mercury, yet he manifeſtly gives the preference to the latter mode, which is laid down by him, Aſtruc ſays, in a more judicious manner, than it had been by any preceding writer. He ſays the diſeaſe was unknown to the ancients, and that it made its firſt appearance, or was firſt noticed in Europe, about the year 1495. He does not conſider it as imported from America, or the Weſt Indies, by the Spaniards, but as procured from cauſes ſimilar to thoſe that occaſion the plague, and other infectious diſeaſes. Aſtruc commends the work, but it has not obtained a place in Luiſinus's collection of treatiſes on the complaint. Aſtruc de Morb. Gall. Haller. Bib. Med.

BETHENNABRIS, in *Ancient Geography*, a town of Peræa, into which the Jews, who fled from Gadara after it was taken by Veſpaſian, retired, and which was forced by the tribune Placidus, before his complete reduction of Peræa.

BETHER, MOUNTAINS OF, are mentioned in the Song of Solomon, ch. viii. 14. Some ſuppoſe Bether to be Bethoron, called Bether by Euſebius, and Bethara by Joſephus. Bether was taken by the emperor Adrian, in the rebellion of Barchochebas. (See BARCHOCHEBAS.) Others will have it to be Betharis, between Cæſarea and Dioſpolis; and others again Bether, mentioned in the LXX. (Joſ. xv. 60.) among the cities of Judah. Calmet ſuppoſes it to be Upper Bethoron, or Bethora, between Dioſpolis and Cæſarea. Euſebius ſpeaks of Betharim near Dioſpolis, and when he mentions Bether, which was taken by Adrian, he ſays, it was in the neighbourhood of Jeruſalem. Ec. Hiſt. l. iv. c. 6.

BETHESDA, the name of a pool at Jeruſalem, of which we have an account in the Goſpel by St. John, ch. v. 1—7. It was called in the Greek κολυμβηθρα προβατικη, and in the vulgate "Piſcina probatica," becauſe, as ſome have ſuppoſed, the ſheep of the ſacrifices, called in Greek προβατα, were waſhed in it; or, according to others, becauſe the blood of the ſacrifices ran into it. But neither of theſe ſuppoſitions is ſatisfactorily proved. The ſheep were probably waſhed as ſoon as they were bought in the adjoining market, from which they were driven into this pool, which always contained a ſufficient quantity of water for this purpoſe. The latter ſuppoſition could not poſſibly have been realized; ſince, in that caſe, the blood muſt firſt have deſcended, and afterwards aſcended to this pool, as there was a drain or ditch between the pool and the temple, and a bridge over it for paſſing into the temple. Hence Dr. Pococke, who adopted the idea of the blood's running into the pool, was obliged to ſeek for lower ground on the other ſide of the temple, and to place it in a ſituation where it did not exiſt, as any one may ſatisfy himſelf by adverting to the plan of the temple at Jeruſalem. The ſituation of the ſheep-gate, near which this pool, or bath, ſtood, was on the ſouth-eaſt wall of Jeruſalem, and therefore a great part of the city lay between that and the temple, as the accurate Dr. Lightfoot has ſhewn in his "Harmony of the Evangeliſts," p. 666. The appellation "Betheſda" has therefore been erroneouſly derived from בית אשרה, *domus effuſionis*, the ſink-houſe, or drain.

The

The etymology, therefore, of those who derive "Bethesda" from בית חסדה, the *house of mercy*, is much more just and appropriate; because it expressed the kind design with which this bath was contracted, and the salutary purposes to which it was applied. The history informs us, that this pool had five porches, porticoes, or cloysters, which might very reasonably have been the case, notwithstanding its oblong figure: one being on each hand of the entrance in the middle of one side, and three on the other sides. Dr. Lightfoot suggests, that the bason itself might be in the form of a pentagon, and that these cloysters might correspond to its five sides. Mr. Maundrell (Journey, p. 107.) who took a view of this pool, in 1696, informs us, that it is 120 paces long, 40 broad, and 8 deep; but without water; and that at the west end he found some old arches, then dammed up, which, though only three in number, were supposed to be the five porches, in which sat the lame, halt, and blind. This pool, he adds, is contiguous, on one side, to St. Stephen's gate, and on the other to the area of the temple. In these porticoes diseased and debilitated persons lay, "waiting for the moving of the water:" for at the time of a certain feast, which some have supposed to be the passover, and others the pentecost, or rather, according to the season, i.e. occasionally, at certain intervals of time, "an angel descended into the pool, and troubled the water; whosoever then first, after the troubling of the water, stepped in, was made whole of whatever disease he had." Some have supposed that the miraculous cure, recorded in this history, was restricted to the season of the particular feast mentioned in the first verse of the chapter; and thus they account for the silence of Philo and Josephus with regard to this miracle. But those, who imagine that these waters had a sanative quality on other occasions, think the silence of these Jewish writers to be of little importance; as they have omitted the mention of other more important occurrences in our Lord's history, which they had an opportunity of knowing; such as the variety and multitude of signal miracles which he performed in the course of his ministry. The majority of writers have regarded the cures wrought at this place as a standing miracle among the Jews, and yet they have been surprised that Josephus, in particular, should omit to mention a fact so honourable to his nation. Others have, therefore, conceived, that the miraculous healing quality of these waters was a peculiar honour conferred on the personal appearance of the Son of God upon earth. To this purpose Dr. Doddridge (in loc.) after Calvin, observes, that God, to add the greater lustre to his Son's miracles, as well as to shew that his ancient people were not entirely forgotten by him, had been pleased of late to perform some supernatural cures at this place. With respect to the descent of the angel into the pool, and the effect produced by his stirring the water, different hypotheses have been proposed. Grotius thinks, that the angel is said to have descended, not because he was ever seen to do so, but because the Jews were persuaded that God brought such things to pass by the ministration of angels; so that from the violent motion of the water, and the effect produced by it, the presence of an angel was reasonably supposed. Dr. Hammond (in loc.) supposes, that the blood of the great number of sacrifices, washed in this pool, communicated a salutary efficacy to the water, upon its being stirred up by an angel, or messenger, deputed for this purpose by the high-priest; which hypothesis Dr. Doddridge represents to be as unphilosophical, as it is unsupported by history and antiquity. Mr. Fleming (Christology, vol. i. p. 13—15.) in order to avoid the apparent difficulties of the literal interpretation, rejects the latter part of the *third* and the whole of the *fourth* verse, as a spurious addition of some ignorant monk in the 8th or 9th century; because that part is wanting in the Cambridge, or Beza's MS. and is written by a later hand in the margin of that in the French king's library, highly extolled by Lamy in his "Harmony." But this passage is found in all the other most celebrated MSS., in the Syriac version, and in the other versions of the Polyglott. Kuster's observations, relating to the genuineness of this text, in the preface to his edition of Mill's New Testament, deserve to be considered. But with regard to the subject in dispute, it should be recollected, that the *seventh* verse, which none question, implies, that the water, after being troubled, had a miraculous virtue, which extended only to the first that went in, and cured his disease, whatever might be its nature. Dr. Doddridge suggests the following solution of this difficulty; the greatest, as he acknowledges, that occurs in the history of the evangelists, and with respect to which none of the numerous writers who have replied to Mr. Woolston had given him satisfaction. He supposes this pool might be remarkable for some mineral virtue attending the water; and this circumstance, together with its being so near the temple, where a bath was so much needed for religious purposes, may account for the stately cloysters erected around it. Some time before this passover, an extraordinary commotion had been probably observed in the water; and Providence so ordered it, that the next person who accidentally bathed here, being under some great disorder, experienced an immediate and unexpected cure. The like phenomenon, in some other desperate case, was probably observed in a second commotion. These commotions and cures might happen periodically, perhaps every sabbath, for some weeks or months. This the Jews would naturally ascribe to some angelic power, as they did afterwards the voice from heaven, (John xii. 29.) though no angel appeared. On account of their ingratitude to Christ for this miracle, and those wrought at the former passover, and in the intermediate space, this celestial visitant probably returned no more; and therefore, it may be observed, that though the evangelist speaks of the pool as still at Jerusalem, when he wrote, yet he mentions the descent of the angel, as a thing which had been, but not as still continuing. This may account for the silence of Josephus, who was not born when it happened; and who, if he heard the report of it, would oppose speculation and hypothesis to fact, and recur to some indigested and unmeaning harangues on the unknown force of imagination; or if he secretly suspected it to be true, his dread of the marvellous, and his fear of disgusting his Pagan readers with it, might as well lead him to suppress this, as to disguise the passage through the Red Sea, and the Divine Voice from mount Sinai, in so mean and foolish a manner, as it is known he does. Besides, the relation which this fact bore to the history of Jesus, would make him peculiarly cautious in treating upon it, as it would have been difficult to handle it at once with decency and safety. The ingenious and learned bishop Pearce, in his excellent "Vindication of Christ's Miracles," p. 68, &c. agrees with Dr. Doddridge in the most material circumstances of his hypothesis.

BETH-GAMUL, the *house of the weaned*, or *of the camel*, a city of the Moabites, in the tribe of Reuben. Jer. xlviii. 23.

BETH-JESHIMOTH, the *house of desolation*, or, *of position*, or, *of denomination*, a city of Reuben (Josh. xiii. 20.) afterwards possessed by the Moabites. Ezek. xxv. 9.

BETH-LEBAOTH, the *house of lionesses*, a city of Simeon, (Josh. xix. 6.) sometimes called Lebaoth. Josh. xv. 32.

BETHLEHEM, the *house of bread*, a city of Judah, (Josh. xvii. 7.) generally called "Bethlehem of Judah,"

to diſtinguiſh it from another of the ſame name in Zebulun. It is ſeated on the declivity of a hill, 6 miles ſouth from Jeruſalem, according to Euſebius and Jerom. It is likewiſe called "Ephratah," (Gen. xlviii. 7. Mic. v. 2.) This city was not very conſiderable either for its extent or riches; but it has acquired peculiar diſtinction on account of its having been the place of our Saviour's nativity. It was alſo the city of David's nativity. In and near this city travellers are ſhewn the place where our Saviour was born, which is ſaid to have been a cave ſouth of the city, and belonging to the inn, or caravanſerai, whither Joſeph and Mary retired. Jerom informs us, that Adrian, in order to eraſe the remembrance of the place where Chriſt was born, planted over the cave a grove of tall trees in honour of Adonis, ſo that when the feſtivals of this infamous deity were celebrated, the holy grotto echoed with the lamentations made in commemoration of Venus's lover. Here is alſo ſeen a large church built by St. Helena, in the form of a croſs, and ſo lofty as to command an extenſive proſpect of the adjacent country. The roof is elevated, flat, and compoſed of cedar within, and leaded without. The nave is ſupported on both ſides by two rows of marble pillars, each made of one piece, and 11 in a row, forming as it were five naves, ſeparated from each other by thoſe rows of pillars, on each of which is the picture of ſome ſaint. Over the pillars the wall is covered with moſaic work, on a gold ground. The marble which formerly overlaid the walls has been removed by the Turks for adorning their moſques. The three upper ends of the croſs terminate in three ſemicircles, having in each an altar. Over the chancel is a ſtately cupola, covered on the outſide with lead, and within adorned with moſaic work. Adjoining to the church is the monaſtery of the Franciſcans. The gardens are defended with ſtrong walls; and through the chapel is a paſſage to a ſquare cave, in which they ſay the Innocents were buried. Beyond this are paſſages to the tombs of St. Jerom, St. Paula, and Euſtochium, and of Euſebius of Cremona; and beyond theſe is a grotto or cell, called the ſchool of St. Jerom, where he is ſaid to have lodged when he tranſlated the Bible. At the end of another vault or chapel, 12 feet wide and 40 long, whoſe floor is paved and ſides lined with white marble, and roof adorned with moſaic work, now much decayed, is an arched concavity, with an altar, having over it the picture of the nativity, and under it a vault, in the middle of which is a ſtar formed of many coloured ſtones, marking the place where they ſay our Saviour was born; and near this is the manger where they pretend he was laid, which is hewn out of a rock, and new flagged with white marble. See MOUNT CALVARY, and JERUSALEM.

Bethlehem is now called *Bait-el-laham;* which ſee. The country in which it is ſituated is happy with reſpect to ſoil, air, and water. With the latter it is ſupplied by a low aqueduct, or ſtone channel, which formerly paſſed to Jeruſalem. The "fons ſignatus" is an exuberant ſpring: it is received ſucceſſively by three large ciſterns, one of which is well preſerved. In coming from the ciſterns, and at a ſmall diſtance, is ſeen what is termed the "deliciæ Solomonis," a beautiful rivulet, which flows murmuring down the valley, and waters in its courſe ſome gardens of excellent ſoil. The brinks of this brook are adorned with a variety of herbage. The convent at this place contains, under the ſame roof, the different tenets of Latins, Armenians, and Greeks. Brown's Travels in Africa, &c. p. 363.

We ſhall here obſerve, that no inconſiderable pains and ingenuity have been exerciſed to reconcile the quotation of the evangeliſt Matthew, ch. ii. 6. relating to Bethlehem, with the original text of the prophet Micah, ch. v. 2. The difficulty may be obviated, ſays an ingenious writer, or at leaſt the appearance of inconſiſtency removed, by a proper tranſlation of the latter text. "*And thou, Bethlehem Ephratah, art little in being among the thouſands of Judah;* for *out of thee will come forth unto me a ruler over Iſrael.* That is, thou haſt but little honour in being among the thouſands of *Judah*, compared with that which will accrue to thee from giving birth to the *Meſſiah.*" Thus the LXX ſeem to have underſtood it. Forms of ſpeech ſimilar to this, οὐδαμῶς ἐλαχίστη, *by no means the leaſt* for *the greateſt*, are not uncommon. (See Homer. Il. A. 277. Callim. Hym. Di. 33. Hym. Ap. 31. Eurip. Androm. 81, &c.) This mode of interpretation is confirmed by Lightfoot from the Chaldee paraphraſt; and ſeems to be preferable to that of St. Jerom, or of Dr. Pococke. The former, who has been followed by ſome others, is of opinion, that Matthew produced the paſſage in Micah hiſtorically, not as it was written by the prophet, but as it had been propoſed by the prieſts to Herod, ſo that they ſhould be accuſed of falſe reading, if that were the caſe. The latter, in his notes on the Porta Moſis of Maimonides, thinks, that צָעִיר, in Micah, rendered *little* in the Engliſh tranſlation, has the contrary ſignification to its uſual one of *mean* or *little*, *viz.* that of *noble* or *illuſtrious*, and for countenancing this conjecture he cites Jer. xlviii. 4. and the Chaldee paraphraſe upon that paſſage. Grotius, Olearius, and others, have propoſed that the Hebrew text and the Greek LXX verſion ſhould be read and tranſlated by way of interrogation. Heb. "*Art thou, Bethlehem Ephratah, the leaſt among the thouſands of Judah?* No: *out of thee ſhall he come forth to me*, &c. i.e. I will raiſe up him, &c. Greek LXX. *Art thou, Bethlehem, the houſe of Ephratah, the leaſt to be among the thouſands of Judah?* No: *out of thee*, &c." The learned biſhop Pearce has adopted this mode of tranſlation; and in favour of it he urges, that the Hebrew word צָעִיר, in Micah, rendered *little*, may be rendered *the leaſt*, as it actually is in Judges, vi. 15. 1 Sam. ix. 21. Jerem. xlix. 26. and l. 45. He alſo obſerves, that both in the Hebrew and in the Greek of the O. and N. Teſt. it is not unuſual for a ſentence to be underſtood by way of interrogation, though there is no mark placed at the beginning of the ſentence, uſed in either of the languages for a mark of interrogation. To this purpoſe he refers for the Hebrew to 2 Sam. xviii. 29. 1 Kings, xxi. 7. Job ii. 10. xli. 1. Zech. viii. 6. and for the Greek to 2 Sam. xviii. 29. Matt. xi. 3. Mark xiv. 61. He adds further, that when words are thus uſed interrogatively, there is often at the end of them an anſwer of *Yes*, or *No*, to be ſupplied in the ſenſe, though it is not expreſſed in the words. This is very common with thoſe who write in the Hebrew language, or with thoſe, who, being Hebrews, write in Greek. In the N. T. the word, *No*, is to be ſupplied in 1 Cor. x. 19, 20. The ſame mode of ſpeaking is found in 1 Cor. xii. 31. Acts viii. 31. and an inſtance, where *Yes* is to be ſupplied, is to be found in 1 Cor. ix. 20. From theſe remarks the learned prelate concludes, that, if this be the caſe, an interrogation with a *No* to be ſupplied as an anſwer to it, is the ſame as a negative not put in interrogation; or, in other words, to aſk whether any thing is *the leaſt*, and to anſwer *No*, as the Hebrew text and LXX verſion do, is the ſame as to affirm, that it *is not the leaſt*, as Matthew does. Either of the above interpretations will effectually ſuperſede the perplexity of St. Jerom, and the objections of Dr. Middleton, in his "Works," vol. ii. p. 59. See Wakefield's "New Tranſlation of the Goſpel of St. Matthew," p. 26. "Pearce's Commentary," vol. i. p. 10.

BETHLEHEM, a town of the tribe of Zebulun, (Joſh. xix. 15.) of obſcure and unknown ſituation.

BETHLEHEM,

Bethlehem, in *Geography*, a town of the Netherlands, in Brabant. N. lat. 51° 2′. E. long. 4° 40′.

Bethlehem. See Belem.

Bethlehem, a town of America, in Albany county, New York, fruitful in pastures, and affording large quantities of excellent butter. By the state census of 1796, 388 of the inhabitants are electors.—Also, a township in Berkshire county, Massachusetts, containing 261 inhabitants. It lies about 10 miles S. of E. from Stockbridge, and 130 from Boston, and borders on the Tyringham and Loudon.—Also, a township in Hunterdon county, New Jersey, situate at the head of the south branch of Rariton river, and containing 1335 inhabitants, including 31 slaves.—Also, a township in Litchfield county, Connecticut, joining Litchfield county on the north, and Woodbury on the south.—Also, a post town in Northampton county, Pennsylvania, which is a celebrated settlement of the United Brethren of the Protestant episcopal church, as they term themselves. It is situate on Lehigh river, a western branch of the Delaware, 53 miles northerly from Philadelphia, and 18 southerly from the Wind Gap. The town stands partly on the lower banks of the Manakes, a fine creek, which affords trout, and other fish, in a healthful and pleasant situation, and in summer is much frequented by gentry from different parts. In 1787, there were 60 dwelling-houses of stone, well built, and 600 inhabitants. Besides the meeting-house, this place has three other public buildings, which are spacious; one for the single brethren, one for the single sisters, and the other for the widows. In a house adjoining the church is a school for females, and since 1787, a boarding-school for young ladies, under the direction of the minister of the place, who also superintends the boys' school, kept in a separate house. Both these schools are in high repute, and much frequented. At the lower part of the town there is an hydraulic machine of simple construction, that raises the water from a spring to a reservoir, at the height of 100 feet, whence it is conducted by pipes into the several streets of the town. In this town are also a store, with a general assortment of goods, a large tan-yard, a grist-mill, a fulling-mill, an oil-mill, and a saw-mill, and on the banks of the Lehigh, a brewery. N. lat. 40° 37′. W. long. 75° 14′.

Bethlehem, *Star of*, in *Botany*. See Ornithogalum.

BETHLEHEMITES, or Bethlemites, in *Church History*, a sort of monks introduced into England in the year 1257, habited like the Dominicans, except that, on their breast, they wore a star with five rays, in memory of the star or comet which appeared over Bethlehem at the nativity of our Saviour. They were called at Cambridge, and had only one house in England.

There is also an order of Bethlehemites still subsisting in Peru, who have convents at Lima; one called of the incurables, the other of our Lady of mount Carmel. These Bethlehemites came originally from the city of Guatimala in Mexico, where they were instituted by the venerable Peter Joseph of Betaneur, a native of the town of Chasna, or Villa Fuerte, on the island of Teneriff, in 1626, for the service of the poor. After his death, which happened in 1667, his congregation was approved of by a bull of Clement X. in 1672, and in 1674. Innocent XI. in 1687, created it into a community of regulars. Before this time it had passed from Guatimala to Mexico, and from thence, in 1671, to Lima. In the city of St. Miguel de Piura, they took possession of the hospital of St. Ann, in 1678, and of that of St. Sebastian, in Truxillo, in 1680. Their probity and diligence in discharging these trusts induced other places to select them as directors of their hospitals, and among the rest, the city of Quito. The fathers of their order go bare-footed, and wear a habit of dark brown colour, nearly resembling that of the capuchins, whose order they also imitate, in not shaving their beards. On one side of their cloak is an image of our Lady of Bethlehem. Every sixth year they meet to choose a general, which ceremony is performed alternately at Mexico and Lima.

The Bethlehemites, though outwardly of great simplicity, pass for the most refined politicians; insomuch as to be called the quintessence of the Carmelites and Jesuits. They are all friars. For their almoner they choose a secular priest, whom they hire, and who has no vote in the chapter.

BETHLEM, Gabor, in *Biography*, prince of Transylvania, was a descendant of a family of rank, but very small property, and attached to the reformed religion. By his valour he obtained the favour of Gabriel Battori; but having ingratiated himself with the Porte, in a visit to Constantinople, he obtained a force which enabled him to expel Battori, and to establish himself as prince or waiwode, in 1613. He was afterwards led by ambition to extend his dominions, and under the advantage of an alliance with Frederic, the elector palatine, and newly declared king of Bohemia, he made an irruption into Upper Hungary, in 1619. Having reduced this country, he received the submission of Lower Hungary, and in his march towards Vienna he took Presburg, and was acknowledged prince of Hungary. The assistance which was afforded him by the oppressed protestants, induced him to establish liberty of conscience throughout Hungary. At an assembly of the states, he was declared king; but in consequence of a treaty concluded between him and the emperor, he renounced the title and dignity of king of Hungary, and was made in return prince of the empire, with the possession of two duchies in Silesia, and several castles and districts in Hungary. His restless disposition however led him to violate the treaty, and, in 1624, he overran Hungary, till he was defeated by the imperial general, and obliged to take refuge in Cassovia. Upon this a treaty of peace was negociated, by which he renounced all pretensions to Hungary, and all connections with the enemies of the house of Austria, and was invested with several lordships in Silesia, and with authority over Transylvania during life. After this period he remained quiet; and falling into a dropsy, died in 1629. He left legacies both to the emperor and grand seignor. Gaber married the daughter of John Sigismond, elector of Brandenburgh. Mod. Univ. Hist. vol. xxvii. p. 2, &c.

BETH-MAON, the *house of habitation*, or, *of iniquity*, in *Ancient Geography*, a city of the Moabites, in the tribe of Reuben. Jer. xlviii. 23.

BETH-MARCHABOTH, the *house of chariots*, or, *of bitterness extinct*, a city in the tribe of Simeon.

BETH-MAUS, a village of Galilee, between Sephoris and Tiberias, distant, according to Josephus, 4 stadia from the latter. Lightfoot supposes it to be the Beth-meon of the Talmud.

BETH-NIMRAH, the *house of the leopard*, or, *of rebellion*, or, *of bitterness*, a city in the tribe of Gad. Numb. xxxii. 36.

BETHOANNABA, or Beth-hannabah, a town, according to Eusebius, 4 miles east from Diospolis. The name preserves some remains of the word Nob, where the tabernacle continued for some time, in the reign of Saul. 1 Sam. xxi. 1. According to Jerom, Nob was not far from Diospolis.

BETHOGLA, the *house of the feast or dance*, the name of two places: one fixed by Eusebius, 8 miles from Gaza; the other by Jerom, 2 miles from Jordan. The Bethogla of Eusebius is probably part of the tribe of Judah. Josh. xv. 6. The Bethogla of Jerom belong to that of Benjamin. Josh. xviii. 21.

BETHOME, or BETHORA, was otherwise called *Julias*, and was the birth-place of the prophet Joel. The inhabitants of Bethome rebelled against Alexander Jannæus. The town was taken, and they were sent captives to Jerusalem.

BETHONEA, or BETH-OANEA, was situated 15 miles east from Cæsarea, and was famous, according to Eusebius and Jerom, for its beneficial hot baths.

BETHORON, a town of Samaria. The Scriptures mention two of this name, the *Upper* and *Lower*, both [illegible] tribe of Ephraim, (Josh. xvi. 3, 5.) and given by this tribe to the Levites (Josh. xxi. 22.). They were both built by Sherah, grand-daughter of Ephraim (1 Chron. vii. 24.) and restored by Solomon after they had fallen to decay (1 Kings ix. 17. 2 Chron. viii. 5). Their distance from one another was almost the whole breadth of the tribe of Ephraim; the *Upper* being in the north, and the *Lower* in the south of that tribe. The former was situated in the road from Constantinople to Antioch, and the same with *Betaron* of Antonine's itinerary; or *Betaro*, placed between Cæsarea and Diospolis. The latter was seated on a mountain, on the public road to Lydda and Cæsarea, distant 100 stadia, or about 12 miles from Jerusalem; and hence it has been allotted by some to the tribe of Benjamin. Jerom says, that Paula passed through both the Bethorons in her way from Naplouse to Jerusalem. See BITHER.

BETH-PALATH, or BETH-PELETH, *the house of deliverance*, or *of expulsion*, a city in the most southern part of the tribe of Judah. Josh. xv. 27. Nehem. xi. 26. This city was surrendered to the tribe of Simeon.

BETH-PAZZEZ, *the house of division*, a city in the tribe of Issachar. Josh. xix. 21.

BETH-PEOR, or BETH-PHAGOR, *the temple of Peor*, a city of Moab given to the tribe of Reuben, (Deut. iv. 46.) where the idol Baal-Peor was worshipped. Numb. xxv. 3. It was situated on the other side of Jordan, opposite to mount Peor, or Phagor.

BETHPHAGE, a village at the foot of mount Olivet, between Bethany and Jerusalem, and about 15 furlongs from the latter. See BETHANY.

BETHSAIDA, a city of the half tribe of Manasseh, near the desert of the same name. It was situated, according to Pliny, on the east, or on the Arabian shore of the lake of Gennesareth, in Batanea, and the lower Gaulonites, according to Josephus, at the beginning of the mountainous country. It was a place of fishing, according to Bochart, and a place of hunting, says Dr. Lightfoot, so called because it stood near Naphtali, where were many deer. Gen. xlix. 21. It was raised by Philip, the brother of Herod the tetrarch, from the rank of a village to the honour of a city, and called *Julias*, in honour of the emperor's daughter. It seems to have been different from Betharamphtha, called also Bethsaida Julias. See BETHARAMPHTHA. This latter Bethsaida, which was on the western shore of the lake of Gennesareth (Mark vi. 45. viii. 22.) was one of the cities against which Christ denounced a woe (Matt. xi. 21.) on account of its impenitence and infidelity, after the mighty works which he had performed in it. It was also the city where three apostles dwelt, viz. Philip, Andrew, and Peter. John i. 45.

BETH-SHALISHA, or BAAL-SALISA, a town of Palestine, in the canton of Thamna, 15 miles north of Diospolis, according to Eusebius, and south-east of Antipatris.

BETHSAN, or BETHSEAN, a town of Samaria in the half tribe of Manasseh, upon the borders of Galilee, on this side Jordan, and about half a league from it. It was the capital of a district of the same name, extending to Peræa. In 2 Maccabees xii. 29. it is placed 600 stadia, or 75 miles from Jerusalem. Josephus says, that it was the largest town of the Decapolis, and that it was 120 stadia, or 15 miles from Tiberias. It was upon the walls of this city that the Philistines, after the battle of Gilboa, hung the bodies of Saul and Jonathan, which were removed in the night by the inhabitants of Jabesh-Gilead, and honourably interred, under a grove of oaks near the city. (1 Sam. xxxi. 10, &c.) In process of time it was called *Scythopolis*, which name it derived from the Scythians, who, in the reign of Josiah, king of Judah, about 635 years before Christ, made an irruption into Palestine, and left a colony at Bethsan. Steph. Byz. and Pliny call it Nysa. Bryant (Anal. Myth. vol. iii. p. 415.) deduces its name Bethsan, from beth, house, or temple, and san, or shan, an ancient denomination of the sun, under which he was worshipped; and he supposes, that he had a temple in this city, to the walls of which the body of Saul was fastened. Images of the sun, under the appellation of Zanes, were peculiar to Sparta. This city, according to him, was built by the Cuthite Ophitæ, or Hivites, some of whom settled in that part of Canaan, called Galilee. As Ophitæ, they worshipped the sun under the figure of a serpent, and they were supposed to be Heliadæ, or offspring of the sun. The serpent they styled san or shan; but as the Hebrew *shan* signified also a tooth, the Grecians instead of saying that the Sparti had their origin from the serpent deity, the sun, made them take their rise from the teeth of a serpent.

BETH-SHEMESH, *the house of the sun*, or *of service*, a Levitical city in the tribe of Dan, or of Judah, for it is assigned to the one and to the other; distant, according to Eusebius, 10 miles from Eleutheropolis, in the way to Nicopolis, or Emmaus. 1 Sam. vi. 12. Josh. xiv. 41. 1 Kings iv. 5.—Also, a city of the tribe of Issachar. Josh. xix. 38. —Also, a city of the tribe of Naphtali. Josh. xix. 38. Judg. i. 33.

BETH-SUR, or BETH-ZUR, *the house of the rock*, or, *of the band*, a city with a strong fortress, seated on a high rock, in the tribe of Judah (Josh. xv. 38.) distant, according to Eusebius, 20 miles from Jerusalem, on the road to Hebron. It was fortified by Rehoboam, to keep the Danites in awe. (2 Chron. xi. 7.) When it was besieged by Lysias, under Antiochus, the son of Antiochus Epiphanes, with an army of 60,000 foot, and 5000 horse, Judas Maccabæus came with 10,000 men to its succour, and obliged Lysias to raise the siege, and defeated his army. B. C. 165. 1 Maccab. iv. 28. vi. 7. Bryant derives the name of this city from beth, temple, and sur, a name given to the sun, under which appellation he had temples and worship.

BETH-TAPPUA, *the apple or orchard house*, a city of Judah (Josh. xv. 53.) said, by Eusebius, to be the last city of Palestine in the way to Egypt; 14 miles from Raphia.

BETHUL, or BETHUEL, a city of Galilee, belonging to the tribe of Simeon, (Josh. xix. 4.) probably the same with *Bethelia*, represented by Sozomen in his history, as belonging to the inhabitants of Gaza, well-peopled, and adorned with several temples remarkable for their structure and antiquity; particularly a pantheon, or temple, dedicated to all the gods, seated on an eminence made of earth, which commanded the whole city. Jerom, speaking of Bethelia, says, that from thence to Pelusium was a short journey of five days. Among the bishops of Palestine, we find one of Bethelia. Reland, l. i c. 35. p. 208. This was probably the same with *Bethulia*, celebrated on account of its siege by Holofernes, at which he was killed by Judith. Judith, vi. 7.

BETHUNE,

BETHUNE, in *Biography*. See SULLY.

BETHUNE, in *Geography*, a town of France, and principal place of a district, in the department of the straits of Calais, seated on a rock in the little river Biatre. The number of inhabitants in the town is estimated at 5000, and in the canton at 15,956. Its territory contains 125 kilometres, and 17 communes. It formerly belonged to the counts of Flanders, but being taken by Gaston, duke of Orleans, in 1645, it was united to France by the peace of the Pyrenees, and the fortifications were repaired under the direction of M. Vauban. In 1710, it was captured by the allied army, under prince Eugene and the duke of Marlborough, and restored to France in 1713, at the peace of Utrecht. This city and the castle are together of a triangular figure; but the castle itself is an irregular building. The houses are mean, and the streets are ill paved, but it contains several churches and convents, and a large handsome square. In the marshy lands, near the city, several canals are cut for the convenience of whitening linen. N. lat. 50° 32'. E. long. 2° 48'.

BETHUNE, a river of France, in Upper Normandy, in the county of Caux.

BETHURA, in *Ancient Geography*, a town of Asia, in Assyria. Ptolemy.

BETIGOLA, in *Geography*, a town of Poland, in Samogitia, 10 miles S.S.E. of Rotienne.

BETIQUA, a town of Africa, in the kingdom of Congo.

BETITLO, a town of European Turkey, in the Morea, 22 miles south of Mistra.

BETLIS, a town of Asia, in Curdistan, situated between two high mountains, at a cannon shot's distance from each other; the residence of a bey, who is subject neither to the king of Persia nor the Turkish emperor, and who commands an army of 20,000 or 25,000 horsemen, besides infantry. It lies on the road from Tauris to Aleppo, and the passage is so narrow, that the prince can stop caravans whenever he pleases. The castle is on an eminence between the mountains, resembling a sugar-loaf, and so steep that it can only be ascended by winding round it. The people in and near the town are shepherds, and are ready to take up arms at the command of their prince. It is distant about 110 miles E. of Diarbekir, and 100 N. of Mosul. N. lat. 37° 20'. E. long. 42° 40'.

BETOLA, a town of Italy, 16 miles S. of Placenza.

BETON, in *Architecture*. See CEMENTS, *Calcareous*.

BETONICA, *Betony*, corrupted from *Vettonica*, which is derived from the Vettones, an ancient people of Spain, in *Botany*. Lin. gen. 718. Reich. 776. Schreb. 973. Tournef. 96. Juss. 114. Smith, Flor. Brit. 267. Class and Order, *didynamia gymnospermia*. Nat. Ord. *Verticillatæ*, or *Labiatæ*. Gen. Char. *Calyx*. perianth one-leaved, tubular, cylindric, five-toothed, awned, permanent. *Cor.* monopetalous, ringent; tube bent in, cylindric; upper lip roundish, entire, flat, erect; lower trifid; middle division broader, roundish, emarginate. *Stam.* filaments four, subulate, the length of the throat; two shorter, inclined to the upper lip; anthers roundish. *Pist.* germ four-parted; style, form, situation, and size of the stamens; stigma bifid. *Per.* none; calyx fostering the seeds in its bottom. *Seeds* four, ovate.

Ess. Char. *Cal.* awned. *Cor.* upper lip ascending, flattish; tube cylindric.

Species, 1 B. *officinalis*, wood betony. Lin. Spec. 810. Hudf. 258. With. 530. Relh. 229. Sibth. 185. Curt. Lond. fasc. 3. t. 3. Fl. Dan. t. 726. Woodw. Suppl. t. 241. Varieties, β. B. alba. Baub. pin. 235. Hall. β. Ger. 577. 2. γ. B. minima alpina helvetica. Tourn. Hall. γ. Lightf. δ. Mor. s. 4. Park. 614. s. 3. Raii Hist. 550. "Spike interrupted; helmet of the corolla entire; middle division of the lower lip emarginate; calyxes smoothish." The common wood betony has an upright stem, a foot high or more, not branched, or very little in its wild state, hairy, channelled, the corners rounded; root-leaves on long petioles, oblong-heart-shaped, obtuse, wrinkled, crenate, with few hairs, but dotted with small hollow points, the edge ciliate; stem-leaves subsessile, lanceolate, serrate; bractes numerous, lanceolate, ciliate, shorter than the calyx; flowers in spikes, composed of several whorls; calyx coloured, sessile, almost upright, villose within, having long hairs between the five long-pointed segments; the two upper teeth recurved; corollas purple, varying to flesh and rarely white; tube downy, longer than the calyx, upper lip commonly entire, sometimes cloven at the end, lower scalloped or crenulate; filaments villose; anthers blackish. A native of woods, heaths, and pastures, among bushes; perennial, flowering in July and August. The dried leaves, by their rough hairs, excite sneezing; and it has accordingly been made an ingredient in the sternutatory powders. But Dr. Cullen observes, that this, as well as marjoram, seems to be only useful, by diffusing and giving an agreeable odour to the other errhines. Sheep eat it, but goats refuse it. This plant dyes wool of a very fine dark yellow colour. The leaves and tops of the betony have an agreeable but weak smell; to the taste they discover a slight warmth, accompanied with some degree of astringency and bitterness. They yield very little essential oil. This, like many other plants formerly in great medical estimation, is at this time almost entirely disregarded. Antonius Musa, physician to the emperor Augustus, filled a whole volume with an enumeration of its virtues, stating it as a remedy for no less than 47 disorders; and hence in Italy arose the proverbial compliments, "tu hai piu di vertu che non ha betonica," i. e. you have more virtues than betony; and "vende la tunica et compra la betonica," i. e. sell your coat and buy betony. Simon Paulli also ascribes to it powers, which may be considered as rather miraculous than natural, and which did not seem to require contradiction, from the experiments of Alston. Modern writers, however, do not allow the betony to possess any considerable efficacy, and it is omitted in the catalogues of the British dispensatories. Scopoli indeed says, that he experienced its cephalic and corroborant effects; but its sensible qualities shew it to be more inert than most of the other verticillatæ. The roots and leaves are said to be very different in quality from the other parts of the plant; and to be nauseous, bitter, purgative, and emetic. Both this plant and eyebright enter into the composition of Rowley's British herb tobacco and snuff. The variety β. is not uncommon with a white flower, in subalpine pastures. Gerard remarked it near Hampstead; and Mr. Miller says, that he often found it in Kent. The small mountainous variety γ is not unfrequent with a spike, nearly globular; the leaves and flowers are smaller; but all these differences are owing to situation.

2. B. *orientalis*, oriental betony. "Spike entire, middle division of the lip of the corolla quite entire." The flowers are larger, and of a lighter purple than those of the common sort. It was first discovered by Tournefort in the Levant, and was cultivated in Kew garden by Mr. Miller in 1739.

3. B. *alopecuros*, fox-tail betony. Sideritis alopecuros. Scop. Carn. n. 711. t. 28. Horminum alpinum luteum, betonicæ spica. Raii hist. 547.—minus album, &c. Bauh. pin. 239. prodr. 114. "Spike leafy at the base, helmet of the corolla bifid." The leaves are altogether heart-shaped, hirsute, and serrate; the flowers smell like elder; the corollas are pale yellow; the filaments linguinous; and the germs smooth and shining. A native of the mountains of Savoy, Piedmont, Austria, Carniola, Silesia, and Provence; cultivated

vated, in 1759, in Kew garden, by Mr. Miller. 4. B. *hirsuta*, hairy betony. B. Alpina. Miller. Dict. n. 3. B. Monierii. Obs. 146. B. Alpina incana purpurea. Barr. ic. 340. B. fol. hirsut. flor. purpur. amplissimis. Mentz. pug. zanon. t. 30. p. 46. "Spikes leafy at the base, helmet of the corolla entire." Resembling the foregoing, but more stout and hairy, with a shorter, thicker spike; a native of the Alps, Apennines, and Pyrenées, and cultivated in Kew garden by Mr. Miller, in 1739. 5. B. *heraclea*. "Spike with woolly calyxes, teeth filiform; leaves lanceolate naked." A native of the Levant. 6. B. *stricta*, Danish betony. Ait. Hort. Kew. 2. 291. B. Danica. Miller. Dict. n. 2. "Spike oblong; helmet of the corolla entire, middle division of the lower lip notch-waved; calyxes hairy." A native of Denmark, cultivated by Mr. Miller in Kew garden, in 1759. 7. B. *incana*, hoary betony. Mill. Dict. n. 5. Ait. Hort. Kew. 2. 229. "Spike interrupted; helmet of the corolla bifid, middle division of the lower lip notched; tube tomentose bent in." A native of Italy; cultivated in Kew garden by Mr. Miller in 1759. All the species of this genus are herbaceous, fibrous-rooted, hardy, perennial plants. The stems are simple, or but little branched. The flowers are in whorls, forming a terminating spike.

Propagation and Culture. All the sorts may be propagated by seeds, or parting the roots: they require a shady situation and a moist stiff soil. The best time for transplanting and separating the roots is in autumn, but the seeds should be sown in the spring upon a shady border; and they will need no other care besides keeping them from weeds, and thinning them when they are too close. Martyn's Miller. Woodville Med. Bot. vol. ii. p. 79.

BETONICA *Aquatica*. See SCROPHULARIA.

BETONICA *Pauli*. See VERONICA.

BETONIM, in *Ancient Geography*, a city of Gad, towards the north of this tribe, bordering on Manasseh. Josh. xiii. 26.

BETO-POULO, in *Geography*, a small island in the Grecian Archipelago. N. lat. 37° 2′. E. long. 23° 33′.

BETOWKY, a town of Poland, in Samogitia, 16 miles west of Rosienne.

BETSCHKOW, a town of Bohemia, in the circle of Czaslau, 9 miles N. W. of Czaslau.

BETSE, or BETSETEK, a town of Hungary, in the county of Beth, seated on the Theis, near its influx into the Danube.

BETROTHMENT, in *Law*, a mutual promise or compact between two parties for a future marriage. The word imports as much as giving one's troth; that is, true faith, or promise. Betrothment amounts to the same with what is called by civilians and canonists *sponsalia*, or *espousals*; sometimes *desponsation*; and by the French *fiançailles*. Betrothment is either solemn, made in the face of the church, or private, made before witnesses out of the church. *To betroth by giving arrhæ*, or earnest, is called, by *Middle Age Writers*, *subbarrare*. In Russia, the betrothing is performed with ecclesiastical rites, generally eight days previous to the marriage, and is indissoluble. During this interval, the bride is only visited by the bridegroom, and the girls of her acquaintance, who amuse her with singing. On the last evening, the young women bring the bride into the hot bath, where they plait and tie up her hair, singing at the same time ballads descriptive of her future happiness. Among the ancient Jews, the betrothing was performed, either by a writing, or by a piece of silver given to the bride, or by cohabitation and consummation. This latter engagement, according to the Rabbins, was allowed by the law (Deut. xxiv. 1.), but it has been wisely forbidden by the ancients, on account of the abuses that might happen, and for preventing clandestine marriages. After the marriage was contracted, the young people had the liberty of seeing each other, which was not allowed them before. If during this time the bride should trespass against that fidelity she owed to her bridegroom, she was treated as an adultress. (Seld. Uxor. Heb. l. ii. c. 1.) The nuns of the Annunciada hold an annual feast, in honour of the desponsation, or betrothment of the Virgin Mary to Joseph.

BETTA, in *Geography*, a town of Asiatic Turkey, 70 miles S.S.W. of Erzerum.

BETTEMBOURG, the chief place of the canton, in the district of Luxemburg, and department of Forêts; containing 812 persons: the number in the canton amounts to 10,139. The territory comprehends 290 kiliometres, and 12 communes.

BETTERTON, THOMAS, in *Biography*, a famous actor, the English Roscius of his time, was the son of an under cook in the household of king Charles I., born in 1635, and after a tolerably liberal education, apprenticed to a bookseller. This bookseller, being the publisher of sir William d'Avenant, introduced Betterton into an acquaintance with him, and by this means he was brought upon the stage, under his patronage, about the year 1656 or 1657. After the restoration, he engaged in the company called the Duke's company, formed in virtue of a patent granted to sir William d'Avenant, which acted at the theatre in Lincoln's-inn fields. Betterton, whose talents had attracted notice, was sent to Paris, by command of Charles I., that he might acquaint himself with the French stage, and contribute on his return to the improvement of the English theatre. A new theatre was accordingly built for d'Avenant's company, in Dorset gardens, and the exhibitions conducted in it were attended with great success. In 1670, Betterton married a Mrs. Sanderson, who excelled as an actress on the same stage, and who contributed, in concurrence with his own exertions, to procure for them not only a comfortable subsistence, but such a surplus as might have served to maintain them in their advanced age. After the coalition of the two companies above mentioned, which took place about the year 1685 or 1686, the merit of Betterton shone with unrivalled lustre; and he acquired the honour of being at the head of his profession. From the account which Cibber has given of his dramatic talents, it appears that no actor entered with a more discriminating judgment into his part, or possessed a greater command over his audience. The leading style of his acting was the grave, dignified, and forcible. His voice, person, and aspect concurred in giving more spirit to terror than to the softer passions; and Cibber adds, in bearing ample testimony to his merit; "I never heard a line in tragedy come from Betterton, wherein my judgment, my ears, and my imagination were not fully satisfied." His powers, however, seem to have been restricted to a particular walk in tragedy; and Othello, Hamlet Brutus, and Hotspur, are enumerated among his striking parts, "and in these the range is from calm dignity to fiery impetuosity."

With respect to his private character, we are told that it was, like his theatrical, manly, decent, and elevated. Having acquired a moderate property, he embarked it, by the advice of a friend, in a commercial project, in which it was lost; and yet that friend's daughter, when she became an orphan, was maintained by him as if she had been his own. In consequence of some disputes which occurred, he was compelled by stage-tyranny, to quit the company, with which he had been long engaged; and a new play-house was opened by his efforts in Lincoln's-inn-fields, in 1695. The growing infirmities of advanced age made it necessary for him to withdraw from the stage, and to acquiesce, which he did with self-possession and serenity of mind, in the narrow circumstances of

his declining life. In 1709, a benefit was allowed him; and on this occasion two eminent actresses, Mrs. Bracegirdle and Mrs. Barry, who had quitted the stage, assisted him by their appearance before the public, and Mr. Rowe contributed an excellent epilogue. In April 1710, he performed again at his own benefit; but the means to which he had recourse for repelling the gout from his feet for this purpose, proved fatal to him on the 28th of that month. He was buried in Westminster abbey; and sir Richard Steele devoted a paper of the Tatler (N 167.) to record the event, and to honour his memory. His veneration for Shakespeare resembled that of his great successor, Mr. Garrick; and, like him, he derived his principal renown from an exhibition of the characters of that famous dramatic writer. The few pieces which Betterton wrote for the stage, owe their chief excellence to his accurate and expressive knowledge of theatrical effect. His widow, with whom he had lived in uninterrupted harmony, did not survive him more than six months; nor, indeed, did she live long enough to enjoy the benefit of that pension which was settled upon her by queen Anne just before her death. We shall close this article with the relation of an anecdote recorded by Motraye in his Travels. When Betterton was one day at dinner with the archbishop of Canterbury, his grace expressed to him his astonishment, that the representation of fables on the stage should make a greater impression upon the mind than that of truth in the sermons of the clergy; to which the actor, having obtained leave to reply, said "May it please your grace, It is because the clergy, in reading their sermons, pronounce them as if they were reading fables: and we, in acting our parts, and using in them a proper gesture, represent them like matters of fact." Biog. Brit.

BETTINGEN, in *Geography*, a town of Germany, in the circle of Westphalia, and county of Blankenheim, three miles north of Geroldstein.

BETTINI, Domenico, in *Biography*, a painter, was born at Florence in 1644, and studied at Rome the works of Mario da Fiori, whose paintings he industriously copied, and whose style and manner he acquired. He painted fruit, flowers, insects, animals, and still life; his objects were well disposed, and skilfully grouped, and had a strong character of truth and nature. This artist died in 1705. Pilkington.

BETTON, in *Geography*, a town of France, in the department of the Ille and Villaine, and chief place of a canton in the district of Rennes; 1½ league north of Rennes.

BETTS, John, in *Biography*, born at Winchester, where he received the rudiments of his education, was elected one of the scholars of Christ-Church Oxford, in 1642. Being of the king's party, he was ejected the house, in that season of confusion and trouble, but permitted, after a time, to return, and was made doctor in medicine, in 1654. Coming to London, he was in much request, particularly by those of the Romish church, of which he was a member. He was also elected one of the fellows of the college of physicians; and on the restoration of king Charles II. was made one of his physicians. Betts published, in 1669, "De ortu et natura sanguinis," which was censured by Dr. Thompson in his True Way of preserving the blood in its integrity. He also published an account of the dissection of Thomas Parr, who lived to the great age of 152 years and 9 months. This account was afterwards inserted in the works of Dr. Harvey, who is supposed to have drawn it up. Wood's Athen. Ox.

BETTYAR, in *Geography*, a town of Hindoostan, and the capital of a province, in the country of Bahar, 80 miles N.N.W. of Patna, and 124 N.E. of Benares.

BETULA, Alder, and Birch, in *Botany*. Lin. Gen. n. 1052. Reich. 1147. Schreb. 1419. Tournef. 350. Juss. 409. Gærtn. t. 90. Class and Order, *monoecia tetrandria*. Nat. Ord. *amentaceæ*. Gen. Ch. * *Male flowers* in a cylindric ament. *Cal.* ament imbricate on every side, loose, cylindric, consisting of three-flowered scales, in each of which are two very minute scales, placed at the sides; three equal floscules fixed to the disk of each scale of the calyx. Perianth in each one-leafed, small, entire, three or four-parted; divisions ovate, obtuse. *Cor.* none. *Stam.* filaments to each four (or three, or two), very small; anthers twin. * *Female flowers* in an ament of the same plant. *Cal.* ament cylindric or roundish, imbricate; with two-flowered scales. *Cor.* none. *Pist.* germ proper, ovate, compressed, very small, two-seeded; styles two, setaceous; stigmas simple. *Per.* none; ament under each side cherishing the seeds of two florets. *Seeds* solitary, ovate. Obs. *Betula* T. has the fruits in cylindric aments; scales three-forked; seeds with a double lateral wing. *Alnus* T. has them in a roundish strobile; scales roundish; seeds angular, without wings.

Ess. Char. *Male. Cal.* one-leafed, three-cleft, three-flowered. *Cor.* four-parted. *Fem. Cal.* one-leafed, subtrifid, two-flowered. *Seed*, with a winged membrane on each side.

Species, 1. B. *alba*, common birch-tree. Lin. Spec. 1393. Hudf. Angl. 416. Wither. 1065. Ger. 1295. Emac. 1478. Park. 1408. Raii hist. 1410. Hunt. Evelyn. 218. Varieties β. B. pendula, weeping-birch. γ. B. alba dalecarlica. Lin. Suppl. 416. "Leaves ovate, acuminate, serrate." The common birch-tree is known at first sight by the silvery colour of its bark, epidermis, or thin outer covering of the bark; the smallness of the leaves in comparison with other timber-trees; and the lightness and airiness of its whole appearance. The branches are alternate, very flexible, covered with a reddish brown or russet, and smooth bark, generally dotted with white; the leaves alternate, bright green, smooth, shining beneath, with veins crossing like the meshes of a net; the petioles about half an inch long, grooved above, and having at the base ovate green glands; the male aments or catkins, which have their scales tipped with brown, appear in autumn at the ends of the twigs, abide in winter, and unfold their flowers, when the female catkins appear in spring at the ends of the shorter branches, on pedicels near a quarter of an inch long; the blossom is egg-shaped, concave, and green; the germs, two or more, are compressed; and the styles and stigmas are reddish. A native of Europe, from Lapland to the subalpine parts of Italy; and of Asia, chiefly in mountainous situations; found with us in woods and moist hedges, and flowering in April and May.

Evelyn observes, that although the timber of birch is the worst of any, it has its various uses; as for the farmer's ox-yokes, for hoops, small screws, paniers, brooms, wands, bavin-bands and wythes for faggots, and formerly for arrows, bolts, and shafts. It served also for dishes, bowls, ladles, and other domestic utensils. In New England, he says, our Northern Americans made canoes, boxes, buckets, baskets, kettles, dishes, &c. of this wood, which they curiously joined with threads made of cedar-roots; and out of an excrescence from the bole, boiled, beaten, and dried in an oven, they made excellent spunk or touchwood, and balls for playing. They also constructed of it pinnaces, which they ribbed with white cedar, and covered with large flakes of birch-bark, sewed with threads of spruce roots, and pitched; to which use it was accidently applied [illegible] Burnt also for fuel; birch-trees having been dug in many of the mosses of the west riding of Yorkshire, which burn and flame like fir and candle-wood; and Pliny says (N. H. l. xvi. c. 18.)

c. 18.) that the Gauls extracted a kind of bitumen out of birch. The inner white cuticle and ſilken bark, which ſtrips off of itſelf almoſt yearly, was anciently uſed for writing tables, before the invention of paper; and with the outward, thicker, and coarſer part are covered divers houſes in Ruſſia, Poland, and other northern tracts, inſtead of ſlates and tile; and in Sweden, the poor have even ground the bark to mingle with their bread corn. From the accounts of more modern writers we learn, that the wood of birch, which is very white, is uſed for women's ſhoe-heels and pattens, and for packing-caſes. It is planted along with hazle to make charcoal for forges; and in the northern parts of Lancaſhire, and in the vicinity of London, beſoms are made with its twigs, for home conſumption, and alſo for exportation. The twigs ſmeared with birdlime are alſo uſed by the fowlers; and in Norway they are given to horſes, when fodder is ſcarce. The bark is ſerviceable in dyeing wool yellow, and in fixing fugacious colours; for which purpoſe it ſhould be uſed dry, and trees of 18 or 20 years growth ſhould be diſbarked at the time when the ſap is flowing. The Highlanders of Scotland uſe the bark for tanning leather, and for making ropes; and they ſometimes burn the outer rind inſtead of candles. In Norway it is dried, ground, and mixed with meal, and boiled up with other food for ſwine, who thrive much upon it. The outer bark, as it eſcapes putrefaction in the dampeſt places, is employed for covering the roofs of houſes, uſed on a layer of turf three or four inches thick. The inner bark is applied by the Norwegians for tanning hides, for fiſhing-nets, and for ſails. With the fragments dexterouſly braided the Laplanders make ſhoes and baſkets, and they uſe large pieces of it for outer garments to keep off the rain. In Kamtſchatka, they convert it into hats and drinking cups. The wood was formerly uſed by the Scots Highlanders for their arrows, but it is now employed by the hoop-benders and wheelwrights, and for a variety of ruſtic implements. The turner uſes it for trenchers, bowls, ladles, &c.; and that which is of a proper ſize ſerves for gates, rails, &c. In France it is generally uſed for wooden ſhoes. It alſo affords good fuel, and ſome of the beſt charcoal; and the ſoot is a good lamp-black for printer's ink. The ſmall branches ſerve the Highlanders for hurdles, and for ſide-fences to their houſes. Moxa is made of the yellow fungous excreſcences of the wood, which ſometimes ſwell out from the fiſſures. The leaves afford good fodder to horſes, kine, ſheep, and goats. The ſeeds are the favourite food of the ſiſkin; and the tree ſupplies a variety of inſects with food.

The vernal ſap of the birch-tree poſſeſſes a ſaccharine quality, and has been uſed both in a fermented and unfermented ſtate, as a wholeſome diuretic wine. It was formerly in great repute againſt all nephritic diſorders; but has been diſcarded from the modern practice. Van Helmont extols a drink prepared with this juice, daucus-ſeeds, and brook-lime. Mr. Boyle ſays (Work, Abr. vol. i. p. 51. vol. iii. p. 338.), that he has ſeen extraordinary medicinal effects of the juice itſelf, even when other remedies failed; and accordingly he provided himſelf with a quantity of it every ſpring. He ſays, it may be eaſily preſerved by pouring a little oil on the top of it, or by diſtillation; but the beſt way is to impregnate it with the fumes of ſulphur. The juice has been uſed for wine, and alſo for brewing, being in the latter caſe employed in lieu of water; and it is ſaid (Phil. Tranſ. N° 46. p. 963.), that a barrel of malt will afford as much, and as good ale, as four with common water. In order to obtain this juice, let holes be bored in the bodies of the larger trees, about the beginning of March, while the ſap is riſing, and before the leaves ſhoot out, and in theſe holes fix foſſets of elder ſticks, cleared of their pith, placing veſſels under them to receive the liquor. A large tree may be tapped in four or five places at a time; and from ſeveral trees may be drawn in this way ſeveral gallons of juice in a day. If a ſufficient quantity be not obtained in the day, what has been gained may be reſerved by bottling it up cloſely till more be procured; but the ſooner it is boiled the better. It has been obſerved, that in the ſpace of 12 or 14 days as much juice may be obtained from one tree, as will outweigh the whole tree, body, and roots. And Evelyn, in his "Sylva," (Hunter's edition, p. 234.) informs us, that a great difference is found between the efficacy of that liquor which diſtils from the bole, or parts of the tree nearer the roots, and that part which flows from the higher branches; the former being more crude and watery, and the latter more pure and refined. When the ſap is obtained, boil it as long as any ſcum ariſes, and well ſkim it during the operation. To every gallon of liquor add four pounds of ſugar, and boil it afterwards half an hour, well ſkimming it; then put it into an open tub to cool, and when cold turn it into a caſk. When it has done working, bung it up cloſe, and keep it three months; then either bottle it off, or draw it out of the caſk, when it is a year old.

The birch, independently of the uſes to which its various parts have been applied, merits culture in parks and ornamental woods for the ſake of variety; its ſtraight ſtem, ſmooth and white bark, and neat foliage, exhibit a picturesque appearance, when properly placed here and there in the openings, ſo as to ſhew the foliage and hanging down of the twigs, or within to diſplay its ſilvery bark through the gloom: and, beſides, its fragrant ſmell after rain, juſtly entitles it to a place in the wilderneſs. Moreover, the birch-tree deſerves cultivation, becauſe it will grow to advantage upon barren land, where better trees will not thrive. It will flouriſh in moiſt ſpungy land, in dry gravel and ſand, where the ſurface is ſhallow; and upon ground, producing only moſs, theſe trees have ſucceeded ſo well, as to be fit for cutting in ten years after planting, and to yield a conſiderable profit at a ſmall expence. Of this ſpecies there are ſeveral varieties. In the variety β, the twigs of young trees are erect, but being ſlender and pliant, they are apt to become pendent with age; and hence proceeds a variety no leſs beautiful than the weeping willow. γ, is a remarkable variety found in Dalecarlia, and deſcribed as having leaves almoſt palmate, with the ſegments toothed. Other varieties of a trifling nature, with ſlight differences in the ſhape of the leaves, are mentioned by Linnæus in his Flora ſuecica.

2. B. *nigra*, black Virginia birch-tree. Lin. Spec. 1394. Reich. 4. 126. Gærtn. fruct. 2. 54. t. 90. Gron. Virg. 188. 146. Raii Dendr. 12. n. 2. Ait. Hort. Kew. 3. 336. "Leaves rhomb-ovate, acute, doubly ſerrate, pubeſcent underneath, entire at the baſe; ſcales of the ſtrobiles villoſe, ſegments linear, equal." This ſpecies being of foreign growth, is propagated for wilderneſs and ornamental plantations; but as it now begins to be more common, it is to be hoped that it will ſoon make a figure among our foreſt trees. It is equally hardy with our common birch, and attains to a much greater magnitude, as it grows to upwards of 60 feet in height. The branches are ſpotted, and more ſparingly ſet on the trees than thoſe of the common ſort. The leaves have their larger ſerratures more deep and remote, beſides ſeveral very ſmall, fine, crowded ones; they are broader, grow on long foot-ſtalks, and add a dignity to the appearance of the tree. The twigs are pubeſcent, and the petioles villoſe. A native of Virginia and Canada; and introduced into Kew gardens in 1736, by Peter Collinſon, Eſq.

It is very deſirable in pleaſure-grounds, as it is the firſt tree in the ſpring which preſents us with leaves, which are of a light

light and lively green. Its white bark makes a beautiful variety, when intermixed with other trees. It is said to be the most useful tree in North America for building both of houses and boats; and will grow fast in any soil or situation, whether wet or dry; and it may therefore be planted in places where few other trees will thrive, and much deserves cultivation. There are several varieties of this species, differing in the colour, size of the leaves, and shoots; such as the broad-leaved Virginian birch, the poplar-leaved-Virginian birch, the paper birch, brown birch, &c.

3. B. *lenta*, Canada birch. Lin. Spec. 1394. Reich. 4. 126. Gron. Virg. 115. 146. "Leaves cordate, oblong, acuminate, serrate." The leaves are smooth, very finely and sharply serrate. The female catkins are ovate, sessile, with acuminate entire scales. This species grows to more than 60 feet in height. The liquor flowing from its wounds is used by the inhabitants of Kamtschatka without previous fermentation; with the wood, and also with the bark, which is very light, tough, and durable, they construct sledges and canoes; and they convert the latter into food by stripping it off when green, and cutting it into long narrow pieces, like vermicelli, drying it, and stewing it with their caviar. It was cultivated by Mr. Miller in Kew garden in 1759. The varieties differ in colour, and are distinguished by the names of dusky Canada birch, white paper birch, poplar-leaved Canada birch, low growing Canada birch, &c.

4. B. *nana*, smooth dwarf birch. Lin. Spec. 1394. Reich. 4. 127. Hudf. Angl. 416. Wither. 2. 207. Hall. Helv. n. 1629. Fl. Dan. t. 91. Pallas Rofs. 63. t. 40. D.—G. Fl. Lapp. t. 4. Lightf. Scot. 575. t. 25. "Leaves orbiculate, crenate, or circular, scolloped." An upright shrub, seldom rising above two or three feet high; with a hard, stiff trunk, and brown, roughish bark, resembling that of the ulmus campestris; branches expanding, straight, scattered, tapering, woolly, somewhat gummy at the ends; leaves rather broader than they are long, commonly three from each bud, but frequently single and alternate, generally entire at the base, scollops often pointed; catkins about half an inch long; styles purple. A native of the northern parts of Europe, and of the Alps; grows on mountains and wet heaths in Scotland; and flowers in May. Here it is planted for the sake of variety, but is of no use; however, Linnæus says, that it is very serviceable in the economy of the Laplanders, affording them in summer, when they live on the mountains, fuel for their fires, which they are obliged to keep constantly in their huts to defend them from the gnats; and, covered with the skin of the rein-deer, forming their beds. The seeds are the food of the ptarmigan, which supplies a considerable part of their subsistance. The moxa is also prepared from it, which they consider as an efficacious remedy in all painful diseases. The leaves, according to Linnæus, dye a finer yellow than that afforded by the B. *alba*.

5. B. *pumila*, American, or hairy dwarf birch. Lin. Syst. 849. Reich. 4. 127. Mant. 124. Jacq. Hort. 2. 122. B. nana. Kalm. it. 2. 263. "Leaves obovate, crenate." Resembling the foregoing. A native of North America, and introduced into Kew garden, in 1762, by Mr. James Gordon.

6. B. *alnus*, alder. Lin. Spec. 1394. Reich. 4. 127. Hudf. Ang. 416. Wither. 2. 206. Lightf. Scot. 576. Pallas rofs. 64. Ait. Hort. Kew. 3. 338. Alnus. Lin. Lap. 340. Hort. Cliff. 441. Gærtn. fruct. 2. 54. t. 90. Hall. Helv. n. 1630. Hunt. Evelyn. 240. Ger. 1294. emac. 477. Park. 1409. Raii hist. 1409. Cam. epit. 68. Varieties, *α. glutinosa*, common alder, "leaves undivided." *β. A. laciniata*, cut-leaved alder. Ait. Hort. Kew. 3. 338. Duham. Arb. 42. n. 4. "Leaves pinnatifid." "Peduncles branched; leaves roundish, wedge-form, very obtuse, glutinous; axils of the veins villose underneath." The common alder, which appears generally as a shrub, sometimes grows to the height of 35 or 40 feet. The bark is blackish, and in old trees full of clefts; the wood is red and brittle; the leaves are of a dark green colour, and roundish figure, crenate, smooth, viscid to the touch; the petioles grooved above and near an inch long, with lanceolate blunt stipules at their base; the male catkins are cylindrical, appear in autumn, and continue to the spring; the females are of a short conical form, like a small fir cone. Many botanists have separated the alder from the birch; but Linnæus, in his latter works, has joined them in the same genus, Gærtner preserves them distinct, alleging that they differ not only in the fruit, but in the flower. A native of Europe, from Lapland to Gibraltar; and of Asia from the White sea to mount Caucasus, in wet and boggy grounds, and on the banks of rivers; flowering with us in February, March, and April. The varieties of this tree are the long-leaved American alder, the white alder, the black alder, and the dwarf alder. The last with a round serrate leaf, grows naturally on the Alps and Apennines; it is a very humble shrub, seldom rising more than a foot high, with its branches always trailing on the ground. The first, or long-leaved alder from America, grows to 30 feet in height, and deserves a place in all plantations. The branches are slender, smooth, numerous, and dark brown or purple; the leaves are long, and free from the clamminess of the common sort; and sometimes continue on the tree even in December, so as to give it the appearance of an ever-green.

The wood of the alder is valuable for piles, pumps, sluices, and in general for all works intended to be constantly under water. It is said to have been used under the Rialto at Venice; and we are told that the morasses about Ravenna were piled with this timber, in order to serve as the foundations of buildings. For this purpose it has been much cultivated in Flanders and Holland. It serves also for many domestic and rural uses, as for cart-wheels, spinning-wheels, milk-vessels, bowls, spoons, small trays, trenchers, and other turnery ware, troughs, handles of tools, clogs, pattens, and wooden heels. The roots and knots furnish a beautiful veined wood for cabinets; and the Scots Highlanders often make chairs of it, which are very handsome, and of the colour of mahogany. The wood that has lain in bogs is black like ebony. It is generally planted for coppice wood, to be cut down every ninth or tenth year for poles. The branches make good charcoal.

The bark is used by tanners and leather-dressers, and also by fishermen for staining their nets. This and also the young shoots dye yellow, and with a little copperas a yellowish grey, useful in the demi-tints and shadows of flesh in tapestry. The shoots cut in March dye a cinnamon colour, and a fine tawny, when dried and powdered. The fresh wood yields a dye of the colour of rappee-snuff. The catkins dye green. The bark is used as a basis for blacks; an ounce of it dried and powdered, and boiled in three quarters of a pint of water, with an equal quantity of log-wood, with solution of copper, tin, and bismuth, six grains of each, and two drops of solution of iron vitriol, will dye a strong deep "bouc de Paris." The leaves have been sometimes employed in tanning leather. The Laplanders chew the bark, and dye their leathern garments red with their saliva. The whole tree is very astringent.

The alder serves for hedges by the sides of streams and ditches, and in all wet and marshy soils, and keeps up the banks; but if it be planted in a low meadow, it is said that the ground about it will become boggy; whereas, if ash be planted, the roots of which penetrate a great way, and run

near the ſurface, the ground will become firm and dry. The growth of graſs is not materially obſtructed by the ſhade of alder. In the highlands of Scotland, near Dundonald, Mr. Pennant ſays, the boughs cut in the ſummer ſpread over the fields, and left during the winter to rot, are found to anſwer the purpoſe of a manure. In March the ground is cleared of the undecayed parts, and then ploughed. The freſh gathered leaves are covered with a glutinous liquor, which ſome people ſtrew upon their floors to deſtroy fleas; the fleas entangling themſelves in the tenacious liquor, as birds do in bird-lime. This tree affords food to many kinds of moths, and other inſects. Horſes, cows, goats, and ſheep, eat it; but ſwine refuſe it. The tongues of horſes who feed upon it are turned black; and ſome perſons ſuppoſe that it is not wholeſome for them.

7. B. *incana*, hoary alder. Linn. Syſt. 849. Suppl. 417. Hall. Helv. n. 1631. Villars Dauph. 2. 790. Pallas Roſs. 64. Du Roy Harbecc. 1. 109. Gmelin. Sib. 1. 171. n. 24. 2. B. alnus incana. Lin. Spec. 1394. Reich. 4. 127. B. viridis. Villars Dauph. 2. 789. Alnus folio incano. Bauh. pin. 428. Raii hiſt. 1410. A. incana et hirſuta. Bauh. Hiſt. 1. P. 2. p. 154. Varieties. α. B. *glauca*, glaucous-leaved alder. "Leaves glaucous beneath; petioles red." β. B. *angulata*, elm-leaved alder. "Leaves green beneath; petioles green." "Peduncles branched; leaves roundiſh, elliptic, acute, pubeſcent underneath; axils of the veins naked; ſtipules lanceolate." This ſpecies is totally diſtinct from the common alder, both in the ſtructure of its parts, and its economical uſes. It never attains the ſize of that, and is commonly ſhrubby; the trunk is ſcarcely thicker than a man's arm; the wood is white, and of a cloſer texture. A native of the Alpine and Subalpine parts of Swiſſerland, Dauphiné, in eaſtern Siberia, in the iſlands beyond Kamtſchatka, &c. Introduced into the Kew garden, in 1780, by Mr. John Buſh. The varieties of the hoary alder are the cut-leaved, the dwarf Alpine, the long-leaved, and the roſe-flowered, with petal-like bractes produced from the male catkin.

8. B. *populifolia*, poplar-leaved birch. Ait. Hort. Kew. 3. 336. "Leaves deltoid, drawn out to a long point, unequally ſerrate, very ſmooth; the ſcales of the ſtrobiles having roundiſh ſide lobes; petioles ſmooth."

9. B. *papyracea*, paper birch. Ait. Hort. Kew. 3. 337. "Leaves ovate, acuminate, doubly ſerrate; veins hirſute underneath. Both theſe laſt ſpecies are natives of North America. Cultivated in 1750 by Archibald, duke of Argyle.

10. B. *excelſa*, tall birch. Ait. Hort. Kew. 3. 337. "Leaves ovate, acute, ſerrate; ſcales of the ſtrobiles having the ſide lobes rounded; petioles pubeſcent, ſhorter than the peduncle." A native of North America. Introduced into Kew garden, about the year 1767, by Mr. James Gordon.

11. B. *oblongata*, Turky alder. Ait. Hort. Kew. 3. 338. Miller. Dict. ed. 7. n. 2. A. fol. oblongo viridi. Bauh. pin. 428. Varieties. α. foliis oblongis, oblong-leaved Turky alder. β. foliis ellipticis, oval-leaved Turky alder. "Peduncles branched; leaves oval, obtuſiſh, glutinous; the axils of the veins naked underneath." Common in Auſtria and Hungary, whence Mr. Miller received the ſeeds. Cultivated by him in Kew garden in 1759.

12. B. *ſerrulata*, notch leaved alder. Ait. Hort. Kew. 3. 338. "Peduncles branched; leaves obovate, acute; veins and their axils villoſe underneath; ſtipules oval, obtuſe." A native of Pennſylvania. Cultivated in Kew garden in 1759 by Peter Collinſon, eſq.

13. B. *criſpa*, curled-leaved alder. Ait. Hort. Kew. 3. 339. "Peduncles branched; leaves ovate, acute, ſomewhat waved; veins hairy underneath; axils naked; ſtipules roundiſh-ovate." A native of Newfoundland and Hudſon's bay. Introduced into Kew garden, in 1782, by the Hudſon's bay company.

14. B. *daurica*. Pallas it. 3. 224. t. kk. f. 4. ab. fl. roſs. 60. t. 39. Gmel. Sib. 1. 167. & 2. "Leaves ovate, acuminate, ſerrate, hairy on the nerve." Scarcely diſtinguiſhable, when young, from the common birch, except by the leaves, not growing ſo tall, and the trunk not exceeding a foot in diameter; bark gray, cleft longitudinally, and dividing into brown ſcales, as if burnt; branches more ſubdivided and upright; leaves harder, commonly ſmaller, on ſhorter petioles; ſtipules lanceolate, gray, ſubpubeſcent, deciduous; male catkins at the end of the twigs of the preceding year, two or three together, larger than thoſe of the common birch; females from the ſame twigs lateral, thicker, with larger, and more rounded ſcales; the ſeed larger, ſurrounded by a narrower membrane; differing from the black American birch by having ſmaller ſtipules, and leaves leſs frequently and never doubly ſerrate. The wood is hard, yellower than that of the common ſort, and in old trees marbled with brown and gray towards the middle; tougher, and therefore more fit for cart-timber and the uſe of the wheelwright; alſo employed in making charcoal. A native of Dauria.

15. B. *fruticoſa*. Pallas. it. 3. App. 758. n. 133. t. kk. f. 1, 2, 3. fl. roſs. 6. 2. t. 40. A. B. C. Gmel. Sib. 1. 167. var. 3. t. 36. f. 2. "Leaves rhomboid-ovate, equally ſerrate, ſmooth." Always ſhrubby, riſing with ſeveral ſtems from the ſame root, in boggy places not an inch thick, nor higher than a man's ſtature, but on mountains attaining the thickneſs of the human arm, and growing to a much loftier height; much branched from top to bottom, and of a very different habit from the common birch; the cuticle aſh-coloured with tranſverſe ſtripes; the wood not ſo white, and waved tranſverſely; the twigs almoſt covered with little reſinous dots found more or leſs in the other ſpecies; buds more copious and always alternate; two leaves commonly from the ſame bud, ſofter than thoſe of the common ſort, and decaying ſooner; having three ſeeds to each ſcale, of the ſame ſize and form with thoſe of the B. *nana*. Abundant in marſhes and on rocky mountains, and in the cold ſubalpine regions of eaſtern Siberia, eſpecially towards the lake Baikal.

Propagation and Culture. The birch-tree may be cultivated either by young plants procured from the woods where they naturally grow, or by ſeeds carefully gathered in autumn, as ſoon as the ſcales begin to open, otherwiſe they will drop and be loſt. As theſe ſeeds are ſmall, they ſhould not be buried above a quarter of an inch deep in the ground. Mr. Miller recommends autumn as the beſt ſeaſon for ſowing them; but Mr. Boutcher directs to ſpread the ſeeds thin on a floor till dry, to mix them with looſe ſand, and to keep them in an airy place till the beginning of March, when they ſhould be ſown on freſh light land, trenched or dug the preceding autumn, made very looſe, raked fine, and divided into beds three feet and a half wide. It is needleſs to throw any earth over them; but in dry and froſty weather, a ſmall quantity of peaſe haulm may be thrown over them for three or four weeks, till the ſeeds begin to vegetate. The ground ſhould then be kept clean, and three or four gentle waterings may be given at noon in April, and repeated to the middle of June in mild evenings. In the following March they may be removed into the nurſery, and planted in rows two feet and a half diſtant, and ten, or twelve, or eighteen inches aſunder. Here they may remain two years, or, in caſes where they make little progreſs, three years; cutting after the ſecond year's growth ſuch as are leaſt thriving or crooked, cloſe to the ground in March. Mr. Miller recommends to

to ſow the ſeeds in the ſhade, alleging that they will thus thrive better than when expoſed to the full ſun. In all places where are large trees, their ſeeds fail, and the plants [illegible]. If [illegible] are taken up without any injury to the roots, they may be tranſplanted into any ground, with little or no preparation; where the land will admit of the plough, it will be beſt prepared by a crop of corn. In the ſpots where they are to ſtand, it will be ſufficient to looſen the ſoil with a ſpade or mattock; and they may then be ſet into holes capable of receiving their roots, which ſhould be covered with earth attached cloſely to them. After they have taken root, they require no other care beſides being kept clear of weeds, which may be cut down two or three times in a ſummer for the firſt two years; and afterwards the plants will be ſtrong enough to keep the weeds down, ſo that they can receive no injury from them. Theſe plants may be ſet any time from the middle of October til. the middle of March, when the ground is free from froſt; but in dry land autumn is the beſt ſeaſon, and for a moiſt ſoil the ſpring is preferable. The diſtance at which they ſhould be placed is ſix feet ſquare, that they may ſoon cover the ground, and that by ſtanding cloſe, they may draw each other up; for in ſituations that are much expoſed, if they are not pretty cloſe, they will not thrive well. If the plants take kindly to the ground, they will be fit for cutting in about ten years; and afterwards they may be cut every ſeventh or eighth year, if they are merely deſigned for the broom-makers; but if they are intended for hoops, they ſhould not be cut oftener than every twelfth year.

As the birch is a native of Britain, it ſuits itſelf to all ſorts of ſoils. It will thrive extremely well on barren land, whether it be wet or dry, ſandy or ſtony, marſhy or boggy. It ſows itſelf, and will come up in places where hardly any other tree will grow. It may be cultivated at a moderate expence; and being eaſily diſpoſed of to the broom-makers, hoop-benders, turners, and for purpoſes of huſbandry, it will yield a conſiderable profit.

The ſecond and third ſpecies, or the American ſorts of birch, may be propagated by ſeeds in the ſame manner as the firſt, and are equally hardy. Seeds ſown in beds of fine mould, and covered about a quarter of an inch deep, will generally grow. They ſhould be conſtantly weeded and watered in dry weather; and at the age of one or two years, according to their ſtrength, they ſhould be planted in rows in the nurſery, in the uſual manner. In ſummer, weeding ſhould be obſerved, and in winter, digging between the rows; and when they are about three or four feet high, they will be of a good ſize for being tranſplanted into the wilderneſs quarters. As theſe American ſorts grow with greater vigour than the common ſort, and thrive on the moſt barren ground, they may be cultivated in England to great advantage. The varieties of the different ſpecies may be propagated by layers. For this purpoſe a ſufficient number of plants ſhould be procured, and ſet on a ſpot of double dug ground, at the diſtance of three yards from each other. In the following year, if they have made no young ſhoots, they ſhould be headed to within half a foot of the ground, to form the ſtools, which will then ſhoot vigorouſly the following ſummer; and in autumn, the young ſhoots ſhould be ſplaſhed near the ſtools, and the tender twigs layered near their ends. They will then ſtrike root, and become good plants in the following autumn; and freſh twigs will have ſprung up from the ſtools to be ready for the ſame operation. The layers ſhould then be taken up, and the operation performed afreſh. If the plants deſigned for ſtools, have made good ſhoots the firſt year, they need not be headed down, but ſplaſhed near the ground, and all the young twigs layered. An immediate crop may thus be raiſed; whilſt young ſhoots will ſpring out in great plenty below the ſplaſhed part, for the purpoſe of layering in the ſucceeding year. This work may be repeated every autumn or winter; when ſome of the ſtrongeſt layers may be planted out, if they are immediately wanted; whilſt the others may be removed into the nurſery, in order to become ſtronger plants, before they are removed to their deſtined habitations. Cuttings alſo, if ſet in a moiſt ſhady border in the beginning of October, will frequently grow; but as this is not a ſure method, and as theſe trees are ſo eaſily propagated by layers, it hardly deſerves to be practiſed.

In Sweden, the budding and leafing of the birch-tree is conſidered as a directory for ſowing barley. See FOLIATION.

The fourth and fifth ſpecies, being of no uſe with us, are not cultivated, except in botanic gardens.

The ſixth ſpecies, or alder-tree, delights in a very moiſt ſoil, where few other trees will thrive, and greatly improves ſuch lands. It may be propagated by layers, cuttings, or truncheons about three feet long. The beſt time for planting truncheons, which is the leſs eligible, though perhaps the leaſt expenſive method, is in February or the beginning of March. Theſe ſhould be ſharpened at one end, and the ground looſened with an iron crow, that when they are thruſt in, the bark may not be torn off. They muſt be planted at leaſt two feet deep, that they may not be diſturbed by ſtrong winds, and ſet at the diſtance of three feet. The plantations ſhould at firſt be cleared of all weeds; and after every fall, in the following winter, the ſtools ought to be looked over, and all the weak ſide-branches taken off. This will ſtrengthen thoſe which are already the ſtrongeſt, and will enable them to ſhoot up more vigorouſly for poles. Many of the truncheons will not grow; and Hunter, in his edition of Evelyn's Sylva, ſays, that he has never ſeen a coppice, raiſed in this way, ſo luxuriant and beautiful, as when raiſed from regular plants. If the alder be raiſed by layers, this operation muſt be performed in October, and in the following October they will have taken ſufficient root for tranſplantation. They ſhould then be ſet at leaſt one foot and a half deep in the ground, and their tops ſhould be cut off to about nine inches above the ſurface, which will occaſion their ſhooting out many branches. The method of raiſing theſe trees by ſeeds, is practiſed abroad, and, ſays Hunter, (ubi ſupra) is greatly to be commended. If theſe trees are deſigned for coppices, they ſhould be placed at the diſtance of ſix feet ſquare, or they may be planted at firſt a yard ſquare, and at the end of ſeven years, when they are felled for poles, every other ſtool may be taken away; and if the ſmall lateral ſhoots be taken off in the ſpring, it will very much ſtrengthen the upright poles, provided a few ſmall ſhoots be left at certain diſtances upon the body to detain the ſap for the increaſe of its bulk. In planting alders for coppices, Hunter (ubi ſupra) ſays, it is much better to raiſe them from young trees than from truncheons. To obtain theſe in ſufficient quantity, plant ſuckers, taken out of the meadows where the alder-trees grow, on a prepared piece of ground, and afterwards head them down for ſtools; lay the ſhoots in the ſucceeding autumn, and in twelve months they will have taken root, when they ſhould be removed and planted in rows, and in one or two years they may be tranſplanted where they are to remain. If the coppice is ſituated upon boggy or watery ground, they may be removed from the nurſery, and planted three feet aſunder, in holes previouſly prepared for receiving them. Here they may ſtand for ſix or ſeven years, when every other tree ſhould be taken away, and the reſt cut down for ſtools. Every ninth or tenth year will afford a fall of theſe trees for

poles; which ſhould be taken off ſmooth and fine, ſo that the ſtool may not be damaged, or hindered from producing a freſh crop.

Theſe trees will thrive exceedingly on the ſides of brooks, and may be cut for poles every fifth or ſixth year. They may be alſo planted for hedges in moiſt ground, and trained into ſuch as are very cloſe and thick, to the height of twenty feet and upwards. The banks of rivers may be ſecured by planting truncheons very cloſe, and croſs-wiſe. As the leaves are large and of a deep green colour; theſe trees, if the beauty of aquatic plantations be regarded, ſhould be preferred to others uſually planted in ſwampy grounds.

The ſeventh ſpecies, or hoary alder, growing naturally in dry ſandy ſoils, may perhaps be cultivated with the birch, where land is of little value, as an underwood, and may be propagated either by layers or cuttings, as well as by ſeeds, where they can be obtained. Martyn's Miller. Hunter's Evelyn's Silva, p. 225. 240. Withering's Bot. Arr. vol. ii. p. 206,

Betula *Americana*. See Bursera.

BETULÆ, in *Entomology*, a ſpecies of Curculio, entirely of a golden-green colour in one ſex, and blue in the other, with a ſpine on each ſide of the anterior part of the thorax of the latter. A native of Europe. Linnæus. Donov. Brit. Inſ. &c.

Betulæ, a ſpecies of Cryptocephalus, that inhabits Berlin. The colour is black; thorax ſomewhat orbicular and hairy; wing-caſes brownifh with obſcure ſtreaks. Herbſt.

Betulæ, a ſpecies of Attelabus, of a black colour, with legs formed for leaping. Linn. Fn. Suec. This is *curculio excoriato-niger* of Degeer.

Betulæ, a ſpecies of Cimex (*Acanthia membranaceus*), that lives on the white alder in the north of Europe. The thorax is denticulated; head muricated; anterior part of the wing-caſes dilated. Linn. Degeer, &c.

Betulæ, a ſpecies of Papilio (*Pleb. Rur.*), found in Europe. The wings are ſomewhat tailed, brown, yellowiſh beneath; poſterior ones with two white ſtreaks. Fabricius. Donov. Brit. Inſ. &c. The larva is green, with pale oblique lines, and white on the ſides; pupa gloſſy, and ferruginous. Feeds on the alder. The male diſtinguiſhed by a fulvous ſpot on the upper wings.

Betulæ, a ſpecies of Tenthredo, with the body red; thorax, vent, and eyes black; wings behind brown. Linn. Fn. Suec. This is *tenthredo ferruginea* of Degeer. Inhabits Europe.

Betulæ, a ſpecies of Coccus, found on the white alder. It is round, and of a bay colour. Gmel. &c.

BETULEIUS, Sixtus, in *Biography*, whoſe true name was *Birch*, was born at Memmingen, in the year 1500, and obtained the reputation of an able grammarian, as well as a good Latin poet and philoſopher. He taught the belles lettres and philoſophy; and became principal of the college of Augſburgh, where he died June 16th 155[illegible]. He publiſhed ſeveral works in proſe; and his dramatic pieces of Joſeph, Suſannah, and Judith, have been eſteemed.

BETULINUS, in *Ornithology*, a ſpecies of Tetrao, deſcribed by Scopoli. The tail is black, varied with tranſverſe rufous ſpots; rump whitiſh, faſciated with black. Scop. Ann. Latham. This is the *urogallus minor* of Aldrovandus; and *birch grous* of Latham. The body is varied with black and rufous; bill and legs black; breaſt greyiſh; quill-feathers white at the tip; eyebrows not red.

BETULUS, in *Botany*. See Carpinus.

BETUWE, Betaw, or Batavia, in *Geography*, a tract of land, in the duchy of Gueldrland, in the United Netherlands, ſituated betwixt the Rhine and the Waal, and forming part of the "Inſula Batavorum," where the Batavians ſettled on their migration out of Germany. It has been divided into two bailliages, viz. the eaſtern or upper, and the weſtern or lower Betuwe. The former, by a change in the courſe of the Rhine, has been ſeparated from Betuwe, and removed into the duchy of Cleve, where the fortifications of the Schenken-Schanze, erected in 1586, by general Martin Schenk, have been gradually waſhed away by the water. The bailliage of lower Betuwe comprehends a number of villages that lie on the Rhine. See Batavi.

BETWEEN Decks, in *Sea Language*, denotes the ſpace contained between any two decks of a ſhip.

BETWHA, in *Geography*, a river of Hindooſtan, which runs into the Jumnah, 25 miles ſouth-eaſt of Calpy. This river, from its ſource ſouth of Bopal, to its confluence with the Jumnah, deſcribes a courſe of 340 miles in a north-eaſterly direction.

BETZ, the principal place of a canton, in the diſtrict of Senlis and department of the Oiſe, containing 352 perſons; the number of the canton being 9364. Its territory comprehends 222½ kiliometres, and 29 communes.

BETZALEEL, Jehudah, or *Leo Pragenſis*, in *Biography*, a Jewiſh doctor of Prague, in Bohemia, flouriſhed about the middle of the 16th century, and was chief of the Moravian academies, and judge of the nation in that country. He left ſeveral learned works, among which is that entitled "The Redemption and Eternity of Iſrael," in which he aſſures the Jews of the certainty of the Meſſiah's advent, and of his ſettling them in a ſtate of permanent proſperity.

BETZANDORFF, in *Geography*, a ſmall town or borough of Germany, in the old mark of Brandenburg.

BETZDORF, the principal place of a canton, in the diſtrict of Luxembourg, and department of Forêts, containing 1082 inhabitants; thoſe of the canton being 8101. Its territory comprehends 212½ kiliometres and 7 communes.

BETZKO, a town of Hungary, 18 miles weſt of Topoltzan.

BETZIRVAN, or Barsan, a town of Perſia, in the province of Aiderbeitzan; 100 miles north-eaſt of Tauris.

BEVAGNA, the ancient *Mevania*, a ſmall town of Italy, in the duchy of Spoleto, ſeated on the river Tinia, or Timia.

BEVECUM, a town of Brabant, 8 miles ſouth-eaſt of Louvain. N. lat. 50° 45′. E. long. 4° 50′.

BEVEL, in *Maſonry*, and among *Joiners*, a kind of ſquare, one leg whereof is frequently ſtraight, and the other crooked, according to the ſweep of an arch or vault; being alſo moveable on a point, or centre, ſo that it may be ſet to any angle. The make and uſe of the bevel are pretty much the ſame as thoſe of the common ſquare or mitre, except that theſe latter are fixed; the firſt at an angle of ninety degrees, and the ſecond at forty-five; whereas the bevel, being moveable, may, in ſome meaſure, ſupply the office of both, and yet, which it is chiefly intended for, ſupply the deficiencies of both, ſerving to ſet off or transfer angles, either greater of leſs than ninety or forty-five degrees.

Bricklayers have alſo a bevel, by which they cut the under ſides of the bricks of arches ſtraight or circular, to ſuch oblique angles as the arches require, and alſo for other uſes.

Bevel, *Graduated*, is that which has about the centre of one of its arms a ſemicircle graven, and divided into 180 degrees, whoſe diameter ſtands ſquare with the ſides of the ſame arm; ſo that the end of the other arm, being divided at right angles, almoſt to the centre, ſhews by its motion the number of degrees contained in the angle to be meaſured. This is alſo called *recipiangle*, and *pantameter*.

Bevel *angle* is uſed among the workmen, to denote any other angle beſide thoſe of ninety or forty-five degrees.

The

The *ſimple Bevel* (ſee *Plate* II. *Geometry*, *fig.* 35.) conſiſts of two rulers moveable on a common centre, like a carpenter's rule, with a contrivance to keep them fixed, at any required angle. The centre C muſt move on a very fine axis, ſo as to lie in a line with the fiducial edges C B, C D of the rulers, and project as little as poſſible before them. The fiducial edges of the legs repreſent the ſides of any given angle, and their interſection or centre C, its angular point. A pin, fixed in the lower ruler, and paſſing through a ſemicircular groove in the upper, ſerves, by a nut A, which ſcrews upon it, to fix the rulers, or legs, when they are placed at the deſired angle.

The uſe of this inſtrument may be illuſtrated in the following examples:

1. Let three points, A, B, C, be in the circumference of a circle, which is too large to be deſcribed by a pair of compaſſes; and let it be required to find any other number of points in the ſame circumference. Bring the centre of the bevel to B (*fig.* 36.), the middle point of the three given ones A, B, and C, and holding it there, open or ſhut the inſtrument till the fiducial edges of the legs lie upon the other two points, and fix them there by means of the ſcrew A (*fig.* 35.): this operation is called *ſetting* the bevel to the given points. Then removing the centre of the bevel to any part between B and A or C, the legs being at the ſame time kept upon A and C, that centre will deſcribe, or be always found in, the arc which paſſes through the given points, and will thus aſcertain as many others as may be required between the limits of A and C. In order to find points without thoſe limits, proceed in the following manner: the bevel being ſet, bring the centre to C, and mark the diſtance C B upon the left leg; remove the centre to B, and mark the diſtance B A upon the ſame leg; then placing the centre on A, bring the right leg upon B, and the firſt mark will fall upon *a*, a point in the circumference of the circle, paſſing through A, B, and C, whoſe diſtance from A is equal to the diſtance B C. Removing the centre of the bevel to the point *a* laſt found, and bringing the right leg to A, the ſecond mark will find another point *a''* in the ſame circumference, whoſe diſtance *aa''* is equal to A B. By proceeding in this manner, any number of points may be found, whoſe diſtances on the circumference are alternately B C and B A. In the ſame manner, by making ſimilar marks on the right leg, points on the other ſide, as at *c'* and *c''* are found, whoſe diſtances C *c'*, *c'c''*, are equal to B A, B C reſpectively. Intermediate points between any of the above are given by the bevel in the ſame manner with thoſe between the original points.

2. Three points, A, B, and C, being given, to draw a line from any one of them, tending to the centre of the circle, which paſſes through them all. Set the bevel to the three given points A, B, and C (*fig.* 37.); lay the centre on A, and the right leg to the point C, and the other leg will give the tangent A G'. Draw A D perpendicular to A G' for the line required. For B A E being = B C A, the angle E A C is the ſupplement to the angle A B C, or that to which the bevel is ſet; hence, when one leg is applied to C, and the centre brought to A, the direction of the other leg muſt be in that of the tangent G'E.

3. Three points being given as before, let it be required to draw from a fourth given point D, a line tending to the centre of a circle paſſing through the firſt three points. On D (*fig.* 38.), with the radius D A deſcribe an arc A K; ſet the bevel to the three given points A, B, and C, and bring its centre, always keeping the legs on A and C, to fall on the arc A K, as at H; on A and H ſeverally, with any convenient radius, ſtrike two arcs, croſſing each other at I; and the required line D *d* will paſs through the points I and D. For a line drawn from A to H will be a common chord to the circles A H K and A B C; and the line I D biſecting it at right angles, muſt paſs through both their centres.

4. Three points being given as before, together with a fourth point, to find two other points, ſuch, that a circle paſſing through them and the fourth point, ſhall be concentric to that paſſing through three given points. Draw A *c* and C *c* tending to the centre, by a former problem; ſet the bevel to the three given points A, B, and C; bring the centre of the bevel to D, and move it upon that point till its legs cut off equal parts A N, C Q, of the lines A *c* and C *c*; and N and Q will be the points required. For, ſuppoſing lines drawn from A to C, and from N to Q, the ſegments A B C and N D Q will be ſimilar ones; and conſequently, the angles contained in them will be equal.

5. Two lines tending to a diſtant point being given, and alſo a point in one of them; to find two other points (one of which muſt be in the other given line), ſuch, that a circle paſſing through theſe three points may have its centre at the point of interſection of the given lines. Draw E H (*fig.* 39.) at right angles to A B, and make F H = F E; ſet the bevel to the angle G D O, and keeping its legs on the points H and E, bring its centre to the line A B, which will give the point I.

An improved bevel is exhibited in *fig.* 40. by which the arcs of circles of any radius, without the limits attainable by a common pair of compaſſes, may be deſcribed. It conſiſts of a ruler A B, compoſed of two pieces rivetted together near C, the centre or axis, and of a triangular part C F E D. The axis is a hollow ſocket fixed to the triangular part, about which another ſocket, fixed to the arm C B of the ruler A B, turns. Theſe ſockets are open in the front for part of their length upwards, as repreſented in the ſection at I, which ſhews the point of a tracer, or pin, fitted for ſliding in the ſocket. The triangular part is furniſhed with a graduated arc D E, by which and the vernier at B, the angle D *c* B may be determined to a minute. In this arc is a groove, by means of which, as well as by the nut and ſcrew at B, or ſome ſimilar contrivance, the ruler A B may be fixed in any required poſition. A ſcale of radii is put on the arm C B, by which the inſtrument may be ſet to deſcribe arcs of given circles, not leſs than 20 inches in diameter. In order to ſet the inſtrument to any given radius, the number expreſſing it in inches on C B, is brought to cut a fine line drawn on C D, parallel and near to the fiducial edge of it, and the arms are faſtened in that poſition by the ſcrew at B. Two heavy pieces of lead or braſs G, G, made in form of the ſector of a circle, the angular parts being of ſteel, and wrought to a true upright edge, as ſhewn at H, are uſed with this inſtrument, whoſe arms are made to bear againſt thoſe edges when the arcs are drawn. The under ſides of theſe ſectors are furniſhed with fine ſhort points to prevent them from ſliding. The fiducial edges of the arms C A and C D, are each divided from the centre C into 200 equal parts. This inſtrument might be furniſhed with ſmall caſtors, like the pentagraph; but little buttons, fixed on its under ſide, near A, E, and D, will enable it to ſlide with ſufficient eaſe.

The uſe of this inſtrument may be exemplified in the following problems:

1. To deſcribe an arc, which ſhall paſs through three given points.—Place the ſectors G, G', with their angular edges over the two extreme points; apply the arms of the bevel to them, and bring at the ſame time its centre C, that is, the point of the tracer, or pen, put into the ſocket, to the third point, and there fix the arm C B; then, bringing the tracer to the left-hand ſector, ſlide the bevel, keeping the

arms

arms conſtantly bearing againſt the two ſectors, till it comes to the right-hand ſector, by which the required arc will be deſcribed by the motion of its centre C. If the arc be wanted in ſome part of the drawing *without* the given points, find by caſe 1. under *ſimple bevel*, other points in thoſe parts where the arc is required; and thus a given arc may be lengthened as far as is neceſſary.

2. To deſcribe an arc of a given radius, not leſs than 10 inches.—Fix the arm C B ſo that the part of its edge, correſponding to the given radius, always reckoned in inches, may lie over the fine line drawn on C D for that purpoſe; being the centre to the point through which the arc is required to paſs, and diſpoſe the bevel in the direction in which it is intended to be drawn; place the ſectors G, G, exactly to the diviſions 100 in each arm, and ſtrike the arc as above deſcribed.

3. The bevel being ſet to ſtrike arcs of a given radius, as in the laſt inſtance, let it be required to draw other arcs, whoſe radii ſhall have a given proportion to that of the firſt arc. Suppoſe the bevel to be ſet for deſcribing arcs of 50 inches radius, and it be required to draw arcs of 60 inches radius, with the bevel ſo ſet. Say, as 50 is to 60, ſo is the conſtant number 100 to 120, the number on the arms CA and CD, to which the ſectors muſt be placed, in order to deſcribe arcs of 60 inches radius. When it is ſaid that the bevel is ſet to draw arcs of a particular radius, it is always underſtood that the ſectors G, G, are to be placed at N° 100 on CA and C D, when thoſe arcs are drawn.

4. An arc ACB (*fig.* 41.) being given, let it be required to draw other arcs concentric to it, which ſhall paſs through given points, e. g. P. Through the extremities A and B of the given arc, draw lines A*p*, B*p*, tending to its centre, by caſe 3. under *ſimple bevel*. Take the neareſt diſtance of the given point P from the arc, and ſet it from A to P, and from B to P. Hold the centre of the bevel on C, any point near the middle of the given arc, and bring its arms to paſs through A and B at the ſame time, and fix them there. Place the ſectors to the points P and P, and with the bevel, ſet as before directed, draw an arc, which will paſs through P′ the given point, and be concentric to the given arc ACB.

5. Through a given point A (*fig.* 42.) in the given line, to ſtrike an arc of a given radius, and whoſe centre ſhall lie in that line, produced if neceſſary. Set the bevel to the given radius, by caſe 2. Through A, at right angles to AB, draw C D; lay the centre of the bevel, ſet as above, on A, and the arm CA on the line AC, and draw a line A E along the edge CD of the other arm. Divide the angle DAE into two equal parts by the line AF, and place the bevel ſo that, its centre being at A, the arm CD ſhall lie on AF; while in this ſituation, place the ſectors at N° 100 in each arm, and then ſtrike the arc.

6. An arc being given, to find the length of its radius. —Place the centre of the bevel on the middle of the arc, and open or ſhut the arms till N° 100 on CA and CD, fall upon the arc on each ſide of the centre; the radius will be found on CB (in inches) at that point of it, where it is cut by the line drawn on CD. If the extent of the arc be not equal to that between the two Nos. 100, make uſe of the N° 50, in which caſe the radius found on CB, will be double of that ſought; or the arc may be lengthened by prob. 1. till it be of a ſufficient extent to admit the two Nos. 100. Adams's Geometrical and Graphical Eſſays, by Jones, 1797.

BEVELAND, in *Geography*, the name of two iſlands, formed by the ſeparate branches of the Scheldt, belonging to the ſtate of Zealand; the one, called *North Beveland*, is about 2 leagues long, and 1½ broad; it is ſouth of Schonen iſland, and on the ſouth ſide of the channel of the eaſt Scheldt, that here runs into the ſea; the other, called *South Beveland*, or *Zuid*, is near 8 leagues long, and 2½ wide, and comprehends the town of Goes and ſeveral villages; it divides the eaſt from the weſt Scheldt, and the two points of its weſt end approach to the channels oppoſite to the ports of Armuyd and Fluſhing. Both theſe iſlands have ſuffered much from inundations.

BEVELLING, in *Ship Building*, the art of hewing timber with a proper and regular curve, according to a mould which is laid on one ſide of its ſurface.

In order to hew any piece of timber to its proper bevel, it will be very expedient to make one ſide fair, and out of winding; a term uſed to ſignify that the ſide of the timber ſhould be a plane. Now if this ſide be uppermoſt, and placed horizontally, or upon a level; it is plain, if the timber is to be hewed ſquare, it may be done by a plummet and line; but if the timber is not hewn ſquare, the line will not touch both the upper and lower edge of the piece, or if a ſquare be applied to it, there will be wood wanting either at the upper or lower ſide. This is called within or without a ſquare. When the wood is deficient at the under ſide, it is called under-bevelling; and when it is deficient in the upper ſide, it is called ſtanding bevelling; and this deficiency will be more or leſs according to the depth of the piece: ſo that before the proper bevellings of the timbers are found, it will be ſometimes very convenient to aſſign the breadth of the timber; nay, in moſt caſes, it will be abſolutely neceſſary, eſpecially afore and abaft: though the breadth of two timbers, or the timber and room, which includes the two timbers, and the ſpace betwixt them, may be taken without any ſenſible error, as far as the ſquare body goes. For as one line repreſents the moulding ſide of two timbers, the foreſide of the one being ſuppoſed to unite with the aft ſide of the other, the two may be conſidered as one entire piece of timber. For further obſervations on this ſubject, and particular inſtructions with reſpect to the mode of bevelling by ribband lines, and by water-lines, ſee Murray's Treatiſe on Ship-building, p. 166, &c. See SHIP.

BEVENSEN, commonly called *Bahmſen*, a town of Germany, in the principality of Luneburgh-Zell, ſeated on the Elmenau, not far from Medingen.

BEVER, a river of Germany, which runs into the Weſer near Beverungen, in the circle of Weſtphalia.

BEVER *Head*, a cape on the ſouth-eaſt coaſt of Nova Scotia. N. lat. 44° 42′. W. long. 62° 20′.

BEVERA, a river of Italy, which paſſes by Soſpello, in the county of Nice, and runs into the Roia, two miles north of Vintimiglia.

BEVERAGE, in a general ſenſe, ſignifies *drink*. Hence nectar is ſaid to be the beverage of the gods. In *Writers of the Middle Age*, *beverage*, *beveragium*, or *biberagium*, denotes money given to an artificer or other perſon, to drink, over and above his hire or wages. Du Cange.

BEVEREN, in *Geography*, a town of France, in the department of the Eſcaut, and chief place of a canton in the diſtrict of Termonde. The place contains 4927 and the canton 15,749 inhabitants; the territory includes 167½ kiliometres and eight communes.

BEVERGERN, a ſmall town of Germany, in the circle of Weſtphalia, and biſhopric of Munſter, ſituate in the midſt of a moraſs, and having near it a ſalt ſpring; 21 miles north of Munſter.

BEVERIDGE, WILLIAM, in *Biography*, a learned and pious prelate of the Engliſh church, was born at Barrow in Leiceſterſhire, in 1638, and admitted in 1653 into St. John's college Cambridge, where he took his degrees of bachelor of arts in 1656, of maſter of arts in 1660, and of doctor of divinity in 1679. At the univerſity he diſtinguiſhed himſelf by his application to the learned languages, and particularly to oriental

oriental literature, in which he so much excelled, that at the age of 18 he wrote a treatise on the excellency and use of the oriental tongues, with a Syriac grammar. He was no less distinguished at college by his early piety and exemplary [illegible]. [illegible] collated by Dr. Sheldon, bishop of London, to the vicarage of Ealing in Middlesex, which he resigned in 1672, upon being chosen rector of St. Peter's Cornhill, by the lord mayor and aldermen of London. In this situation, such were his zeal and assiduity in the discharge of the duties of his office, not only in the pulpit but out of it, and such was the success that attended his labours, that he was denominated "the great reviver and restorer of primitive piety." His singular merit recommended him to the favour of his diocesan, bishop Henchman, who, in 1674, collated him to one of the prebends of St. Paul's; and in 1681, bishop Compton promoted him to the archdeaconry of Colchester, every parish of which he visited in person. In 1684, he was installed prebendary of Canterbury, and he also became chaplain to king William and queen Mary. Declining to accept the see of Bath and Wells, which was offered to him in 1691, he was consecrated, in 1704, bishop of St. Asaph. In this elevated station he prosecuted, with his accustomed zeal and diligence, every practicable measure for advancing the honour and interest of religion, both among the clergy and laity; recommending to the former the "duty of catechising and instructing the people committed to their charge, in the principles of the Christian religion, to the end that they might know what they were to do, in order to salvation," and furnishing them with a plain and easy "Exposition upon the Church Catechism." After having possessed this new dignity for between three and four years, he died March 5th, 1708, in the 71st year of his age, and was buried in St. Paul's cathedral. He left the greatest part of his estate to the societies for pro[illegible] [illegible] Christian knowledge. Of his numerous works, those published by himself were, 1. "De Linguarum Orientalium, præsertim Hebraicæ, Chaldaicæ, Syriacæ, Arabicæ, et Samaritanæ, præstantiâ et usu, cum Grammaticâ Syriaca tribus libris traditâ," Lond. 1658, 8vo.; 2. "Institutionum Chronologicarum libri duo, unâ cum totidem Arithmetices Chronologicæ libellis," Lond. 1669, 4to., 1705, 4to., and 1721, 8vo.; 3. "Συνόδικον, sive Pandectæ Canonum S.S. Apostolorum, et Conciliorum ab Ecclesia Græca receptorum; necnon Canonicarum S. S. Patrum Epistolarum; unâ cum Scholiis Antiquorum singulis eorum annexis, et scriptis aliis huc spectantibus; quorum plurima et Bibliothecæ Bodleianæ aliarumque MSS. codicibus nunc primum edita; reliqua cum iisdem MSS. summâ fide et diligentiâ collata, &c.," Oxon. 2 vols. fol. 1672; 4. "Codex Canonum Ecclesiæ primitivæ vindicatus et illustratus," Lond. 1679, 4to. (See CANONS.) 5. "The Church Catechism explained, for the use of the diocese of St. Asaph," Lond. 1704, 4to.; several times reprinted in a smaller volume. After his death, several of the bishop's works, not intended by himself for publication, and in various respects injurious to his memory, were published by his executor. These consist of devotional tracts, among which are his "Private Thoughts upon Religion," a great number of sermons, a system of divinity, or "Thesaurus Theologicus," an "Exposition of the 39 articles, &c." In his "Private Thoughts" the bishop has incurred animadversion; particularly with respect to his meditation upon the Trinity, in which he unreservedly adopts the famous maxim of Tertullian, "credo, quia impossibile est." The theology of bishop Beveridge was Calvinistical; his extensive learning has been universally allowed; his devotion inclined to mysticism; and as a reasoner and writer, he has been extravagantly extolled by his admirers and panegyrists, and no less severely censured by others, for the quaintness and puerility of his style, the fallaciousness and inconclusiveness of his reasoning, and his avowed opposition to rational sentiments of religion. These reflections, however, result from a perusal of his posthumous writings, the publication of which has been ascribed to avarice or want of judgment on the part of his executor. All have concurred in allowing him the praise of the strictest integrity, of sincere piety, of exemplary charity, and of great zeal for religion. Biog. Brit. Gen. Dict.

BEVERLACKE, in *Geography*, a river of Germany, which runs into the Aland, 3 miles south of Seehausen, in the old mark of Brandenburgh.

BEVERLAND, ADRIAN, in *Biography*, a man of genius and learning, who prostituted his talents in the composition of several obnoxious books, was a native of Middleburgh in Zealand, about the middle of the 17th century, and studied polite literature under Vossius; and for this purpose he visited Oxford in 1672. Devoting himself to the study of the law, he became a doctor and a counsellor; and as a philologer, he made himself known to the learned world. But the subjects of his selection, both for study and discussion, were principally of the impure and loose kind; and of his licentious taste, he gave some specimens in his work, entitled "De jure stolatæ virginitatis, lucubratio academica," Leyd. 1680, 4to.; and in a treatise "De prostibulis veterum," (on the brothels of the ancients), part of which was inserted by Isaac Vossius in his commentary upon Catullus; but which he was dissuaded by his friends from publishing. Before this time, viz. in 1678, he had rendered himself obnoxious by his book on original sin, entitled "Peccatum originale κατ' ἐξοχὴν sic nuncupatum philologicé problematicos elucubratum a 'Themidis alumno, &c.;" in which work he revived the notion of Cornelius Agrippa, that Adam's sin consisted entirely in the commerce with his wife, and that original sin is nothing but the inclination of the sexes to each other. This book was condemned to be burnt by the magistrates at the Hague, and the author was committed to prison, whence he was not liberated without paying a pecuniary fine, and taking an oath that he would never write again upon such subjects. He then removed to Utrecht, where his debauched manners exposed him to fresh odium, and obliged him to withdraw to Leyden. Here he wrote a bitter satire against the magistrates and professors under the title of "Vox clamantis in deserto;" and at length finding himself insecure in Holland, he sought an asylum in England, where Isaac Vossius is said to have procured for him a pension upon the ecclesiastical revenues, which he expended in the purchase of scarce books and medals, and of obscene pictures and prints, till he was reclaimed from his culpable mode of life by an acquaintance with the learned and worthy Dr. Edward Bernard. In token of his regret on account of his past conduct, and of the sincerity of his reformation, he wrote a treatise "De Fornicatione cavenda admonitio, &c." published, probably, first at London in 1690, with a dedicatory epistle to Dr. Bernard, and afterwards in 1698, 8vo.; in which, notwithstanding his pretended, or real reformation, some offensive passages occur. After the death of Vossius, he fell into extreme poverty, and into a state of mental derangement; and probably soon after the year 1712, when he wandered through England, under an apprehension that 200 persons had considerated together to assassinate him, he died. Gen. Dict.

BEVERLEY, or BEVERLY, in *Geography*, is a large corporate borough, and principal town in that portion of Yorkshire called the east riding. It is seated at the foot of the wolds, on the banks of the river Hull, which is rendered navigable, by means of a short canal, up to the town. This place appears to have been of some note previous to the time of

of Bede, whose preceptor, John of Beverley, archbishop of York, founded and erected a monastery here, to which he retired, and wherein he died in 721. King Athelstan having made a vow, before he proceeded against the Scots, instituted a college of secular canons, on his return to this town in 930, and also granted the freemen many immunities and privileges, which were allowed and confirmed by Henry I. and most of the succeeding monarchs to queen Elizabeth. By the last charter, which contains the heads of those previously granted, the government of the town is vested in a mayor, recorder, aldermen, and other subordinate officers. Though within eight miles of Hull, this town preserves great respectability and commercial consequence, from its fairs, markets, and trade. The sessions for the east riding of Yorkshire are held here in a handsome hall, called the Hallgarth, which contains a register office for deeds and wills, that relate to any lands in this part of the county. Beverley has sent two members to parliament from the 26th of Edward I., except a few intermissions in the reigns of Edwards II. and III.

Here were formerly four churches, but only two remain; one of which is a large handsome edifice, and is called the Minster. King Edward VI. and queen Elizabeth granted certain revenues for the support and repairs of this edifice; but those revenues being improperly applied, a Mr. Moyser, M. P. for the town, procured a brief for the repair of it in 1708. His own contributions, with those from his friends, amounted to 1500l.; which, with 800l. raised by the brief, were placed in the funds, and by the rise of the South sea stock, in the year 1720, he was enabled to complete the reparation and adornment of the church in his life-time. King George I. not only encouraged this work by a liberal donation of money, but gave the stone of the dissolved monastery of St. Mary's in York towards the building; sir Michael Warton also gave 500l. and bequeathed 4000l. more as a perpetual fund towards keeping it in repair. The east window contains some fine painted glass; and the screen between the nave and choir is much admired for its ornamental workmanship. The north wall of the great cross-aisle was at one period inclined from its perpendicular, but Mr. Thornton of York invented a machine, which, by means of screws, &c. restored it to its original position. The ancient fabric was consumed by fire in September 1188. Here are several monuments for the Piercys, earls of Northumberland, who built a private chapel in the choir.

The principal trade of Beverley consists in making of malt, oatmeal, and in the tanning of leather. The cloathing trade was, at a former period, an object of much consequence here, but at the time of Leland it was falling fast to decay. Connected with the borough, are four large common fields, containing nearly 1000 acres, in which every burgess or freeman is allowed to pasture a certain number of cattle. In one of these fields is a mineral spa, which has proved serviceable in some cutaneous disorders. There are seven alms-houses in the town, and legacies left for erecting two more. Here is also a free-school, whose scholars are allowed two fellowships in St. John's college Cambridge, also three scholarships and three exhibitions. Beverley is 183 miles north from London. It has weekly markets on Wednesdays and Saturdays; five fairs in the year; and five annual great markets for hogs, &c. This town consists of three parishes, called St. Martin's, St. Nicholas's, and St. Mary's; and according to the official population report in 1800, included 1228 houses, and 5401 inhabitants.

BEVERLY, John of, in *Biography*, archbishop of York in the eighth century, was born at Harpham in Northumberland, and having embraced the monastic life, he became afterwards abbot of the monastery of St. Hilda. He was instructed in the learned languages by Theodore, archbishop of Canterbury, and was justly esteemed one of the best scholars of his time. Some say that he studied at Oxford, and took there the degree of master of arts; but as no degrees were then conferred in this university, this fact has been disputed. By Alfred, king of Northumberland, to whom his merit recommended him, he was advanced, in 685, to the see of Hagustald, or Hexham, and in 687, translated to that of York. Beverley was tutor to the venerable Bede, and intimate with Acca and other famous Saxon doctors, several of whom he engaged in writing comments upon the Scriptures. In 704, he founded a college for secular priests at Beverly, which, in honour of his memory, was endowed by our kings, and particularly by Athelstane, with considerable immunities, so that it became an asylum, or sanctuary, for debtors and persons suspected of capital crimes. After he had governed the see of York 34 years, being tired with the tumults and confusions of the church, he divested himself of the episcopal character, and retired to Beverly, and four years after died in *the odour of sanctity*, on the 7th of May 721; and the day of his death was appointed a festival by a synod held at London in 1416. Bede, and other monkish writers, ascribe to him several miracles. Between three and four hundred years after his death, his body was taken up by Alfric, archbishop of York, and richly enshrined. He was the author of several homilies, and other religious pieces. Biog. Brit.

Beverly, in *Geography*, a township, and post-town of America, in Essex county, Massachusetts, separated from Salem by a handsome bridge, and distant about 20 miles east of north from Boston, and 22 south-west from Newbury port. It has two parishes, containing 3290 inhabitants. Those of the parish next the harbour are devoted to the fishery, and the other branches of navigation. In the other part of the town, which is chiefly agricultural, is a cotton manufactory. N. lat. 42° 31′. W. long. 7° 50′.

Beverly's *Manor*, or *Irish tract*, is a tract of land, in Virginia, in N. lat. 38° 10′, at the head of Massanuten's river, a western branch of the Shenandoah, which rises here by three branches, viz. Middle river, Lewis, and Christian creeks, and lying between the Blue and the North ridge.

BEVERN, a town of Germany, in the circle of Upper Saxony, and duchy of Brunswick, seated on the Weser, 20 miles west of Eimbeck.

BEVERON, a river of Savoy, which runs into the Drance, 4 miles south-west of Evian.

BEVERS, Little, lies to the west of point de la Hune, on the southern coast of Newfoundland island, in North America, between cape de la Hune on the east, and cape Raye on the west, being the south-west point of the island.

BEVERSTADT, a town of Germany, in the circle of Lower Saxony, and duchy of Bremen, 24 miles north of Bremen.

BEVERSTONE, a village of Gloucestershire, England, is situated about two miles west of the town of Tetbury, and is noted for the stately remains of its ancient castle. This fortress is of uncertain foundation, but was undoubtedly a strong place prior to the conquest. Earls Godwin, Swane, and Harald here met under the pretence of assisting Edward the confessor against the Welsh in 1048. Maurice, lord Berkeley, or de Gaunt, fortified and repaired it, and in 1227 was prosecuted by the king for doing so, without royal permission. It was purchased by Thomas lord Berkely soon after the return of Edward III. from the battle of Poictiers. Many of the spoils and ransoms from that battle were appropriated to enlarge and beautify this castle, which was used as a mansion till the great rebellion, when it was strengthened, and held for the king, but besieged by, and surrendered to Col. Massie. Great part of the castle, with a dwelling-house within its walls, was soon afterwards destroyed

ſtroyed by fire. It was originally a ſquare building, with a tower at each corner, one of which ſtill remains, with fragments of walls, and the greater part of a chapel. This has a beautiful arched roof, and on the right ſide of the altar is a ſhrine of tabernacle work, with a lavatory, a cloſet in which is a confeſſional, and over it a priſon. The moat ſurrounding the whole, was about 200 yards in circumference. At a ſhort diſtance north of the caſtle is the pariſh church, which is a ſmall plain building. Rudge's Hiſtory of the County of Gloceſter.

BEVERUNGEN, a town of Germany, in the circle of Weſtphalia, and biſhopric of Paderborn, at the conflux of the Bever and the Weiel, near which are ſprings of ſalt water, 26 miles ſouth-eaſt of Paderborn.

BEVERWYCK, John Van, or Beverovicius, in *Biography*, not more known and eſteemed as a phyſician than as a magiſtrate, and member of the adminiſtration in his country, having attained to high honours in both thoſe capacities, was born at Dordrecht in Holland, in 1594. Being of a diſtinguiſhed family, he had the advantage of receiving inſtructions in claſſical literature from Gerard John Voſſius, and afterwards of ſtudying the different branches of medicine under the ableſt maſters in France and Italy. Returning to his own country, he took the degree of doctor in medicine at Padua, about the year 1624. His works are numerous. Thoſe moſt deſerving notice are, "Epiſtolica queſtio, de termino vitæ fatali an mobili, cum doctorum reſponſis:" 8vo. 1634, Dord. Whether there is a fixed term, beyond which life cannot be extended, he determines in the negative. "Montanus, Refutatio argumentorum, quibus medicinæ neceſſitatem impugnat;" 8vo. 1634, Dord.: in which he anſwers the cavils of the ſieur Montagne againſt phyſicians, and ſhews the neceſſity of the art. "Idea Medicinæ veterum," 8vo. 1637, Leiden. A compendium of the practice of medicine, taken from the moſt valuable writers on the ſubject. "Epiſtolicæ queſtiones cum doctorum reſponſis." 8vo. 1644, Rotter. A collection of letters on ſubjects pertaining to medicine, to which are added, the Elogia of Medicine by Eraſmus, Cardan, and Melanchon. His works, of which Haller has given a complete liſt, were publiſhed together in 4to. at Amſterdam, 1651. They have moſt of them paſſed through ſeveral editions. He died Jan. 19th 1647, and was honoured with an epitaph by his friend Heinſius. Haller Bib. Med. Gen. Biog.

Beverwyck, in *Geography*, a town of North Holland, with a ſmall harbour in the Wyckermeer, which is a continuation of the Ye, 3 leagues north of Haerlem.

BEUF, John Le, in *Biography*, a learned and laborious French writer, was born at Auxerre in 1687, and educated at Paris. After his return to his native town, he was made canon of its cathedral in 1711, and during his reſidence there frequently attended the deputies of the clergy at Sens, to aſſiſt them in reforming the liturgies of that dioceſe. In 1734, he was engaged by the archbiſhop of Paris in the compoſition of the chant in the new breviary and miſſal of that city; and from this time he chiefly reſided at Paris. He was admitted an aſſociate of the academy of belles lettres and inſcriptions in 1740, and twice obtained the prize of that academy, and five times that of the French academy at Soiſſons. He was one of the moſt indefatigable, intelligent, and ſatisfactory eccleſiaſtical antiquaries of France. The catalogue of his works from 1716 to 1741, fills 12 pages in folio in the Burgundy library; and his ſubſequent productions for the laſt 14 years of his life, are nearly as numerous. His "Traité ſur le chant eccleſiaſtic" is full of curious reſearches, and, perhaps, the ſafeſt guide on the ſubject which a muſical hiſtorian of the firſt ages of the church can conſult. This prodigy of learning died in 1760.

The beſt known of his numerous works, beſides that already mentioned, are "A Collection of various writings, tending to illuſtrate the hiſtory of France," 2 vols. 12mo. 1738; "Diſſertations on the eccleſiaſtical and civil hiſtory of Paris," 3 vols. 12mo.; "Memoir on the hiſtory of Auxerre," 2 vols. 4to. 1743; "Hiſtory of the city and of all the dioceſe of Paris," 15 vols. 12mo.; more than 200 "Memoirs," or "Hiſtorical Diſſertations," inſerted in the journals of the times; and a variety of diſſertations printed in the Memoirs of the Academy of Inſcriptions. He alſo liberally communicated a number of original pieces, which he found in his aſſiduous reſearch, to learned men engaged in different works. Nouv. Dict. Hiſt.

Beuf, *Riviere au*, in *Geography*, a river of America, that diſcharges itſelf eaſtward into Miſſiſſippi river, in N. lat. 39° 4', about 48 miles by the courſe of the river, above the mouth of the Illinois, and 7 miles ſouth from Riviere Oahaha.

Beuf, *Small Le*. See *Le* Boeuf.

BEVIEUX, a village of Swiſſerland, in the government of Aigle, in that part of the Valais which belongs to the republic of Berne. Bevieux is diſtant about 5 miles from the ſmall town of Bex, and is famous for its ſalt ſprings. Mr. Coxe informs us, that he went into the mountain about 3000 feet, almoſt horizontally. The gallery is 6 feet high, and 4 broad, and nicely hewn and hollowed in a black rock, veined in ſome places with white gypſum. The ſalt is procured from ſprings, which are found within a ſolid rock, perforated at a great expence; the richeſt ſource yields 28 pounds of ſalt per cent. and the pooreſt but half a pound. Near theſe ſprings are ſeveral warm ſources, which contain a mixture of ſalt, but are ſo ſtrongly impregnated with ſulphur, as to flame when a lighted candle is put into the pipe through which they flow. No ſolid ſalt, except a few cubes, has been yet diſcovered: but the mountain is replete with its particles. Rocks of white gypſum, or alabaſter, mixed with blueiſh clay, are common near the ſprings, in the ſame manner as may be obſerved in the pits of Northwich in Cheſhire. After travelling in this ſubterraneous paſſage near three quarters of a mile, Mr. Coxe obſerved a great wheel, 35 feet in diameter, which raiſes the brine from the depth of about 70 feet. From this place is a ſhaft 300 feet high, which is cut through the mountain to the ſurface, for the purpoſe of introducing freſh air. He noticed two reſervoirs hollowed in the ſolid rock for holding the brine; one was 160 feet ſquare, and 9 deep. In proceſs of time, the workmen pierced the rock 25 feet deeper, and cut a gallery 100 feet long, and they formed a third reſervoir, containing 5500 cubic feet. The brine depoſited in theſe reſervoirs is conveyed by means of 2000 pipes, about a league to Bevieux, where the ſalt is extracted. The brine pits near Aigle contain only from two to one half per cent. and yield annually about a third as much as thoſe of Bevieux, or about 5000 quintals. The ſalt is much whiter and heavier than that of Bevieux, and conſequently bears a higher price. Theſe, which are the only ſalt-works in Swiſſerland, ſcarcely yield a net yearly profit of more than 3000l. and furniſh only one-twelfth of the annual conſumption of the canton. The remainder is procured chiefly from France, at a moderate price, ſtipulated by treaty. Coxe's Travels, vol. ii. p. 105.

BEUIL, in *Geography*, the chief place of a canton, in the diſtrict of Puget-Theniers, and department of the maritime Alps, containing 468 inhabitants; thoſe of the canton amount to 2133. Its teritory comprehends 225 kiliometres, and 6 communes.

BEVILE', in *Heraldry*, denotes a thing broken, or opening like a carpenter's rule.—Thus he beareth argent a chief bevilé vert, by the name of *Beverlie*.

BEVIN, Elway, in *Biography*, among our eccleſiaſtical compoſers in the time of James I., juſtly deſerves to be ranked

ranked with the muſical luminaries of that reign. He was a ſcholar of Tallis, which is diſcoverable by his works; but it is not quite ſo eaſy to diſcover how it could have been at the recommendation of his maſter, who died 1585, that he was ſworn in gentleman extraordinary of the chapel royal, in 1589, as has been ſaid. His ſervice in D minor, printed in Boyce's collection, has the true ancient caſt of modulation, the ferrugo pretioſa upon it, which gives a dignity to its effects, for which we can now hardly account. The accents, as uſual with old maſters, are often erroneouſly placed; but if that imperfection be removed, or regarded with indulgence, the compoſition muſt be allowed, in point of harmony and modulation, to be admirable. And there are ſome grand effects produced by pauſes and long notes without changing or infringing the original meaſure, that afforded us very pleaſing ſenſations. Elway Bevin was, indeed, a man of genius; and it is to be lamented that more of his compoſitions have not been preſerved. Beſides his appointment in the chapel royal, he was organiſt of Briſtol cathedral, and the maſter of Dr. Child. But notwithſtanding his abilities and great age, he was diſmiſſed from all his employments, in 1636, on being diſcovered to adhere to the Romiſh communion.

In 1631, he publiſhed a work replete with harmonical erudition, entitled "A Briefe and ſhort inſtruction of the art of muſicke, to teach how to make diſcant of all proportions that are in uſe: very neceſſary for all ſuch as are deſirous to attaine to knowledge in the art; and may by practice, if they can ſing, ſoone be able to compoſe three, foure and five parts: and alſo to compoſe all ſorts of canons that are uſuall, by theſe directions of two or three parts in one, upon a plainſong," by Elway Bevin. thin 4to. of 52 pages.

This work, however uſeleſs it may be deemed now, muſt have been of ſingular ſervice to young ſtudents in times when canons were regarded as the greateſt efforts of human intellect, and the ſolution of theſe enigmas was equally difficult with that of the moſt abſtruſe and complicated problems in Euclid. Micheli Romano publiſhed a ſimilar work at Venice, 1615, and Valentini another at Rome, 1655. See Micheli and Valentini.

BEVIO, in *Geography*, a ſmall village of Swiſſerland, ſeated near the Julian Alps, upon the Little Rhine, in the high road leading to Coire. Bevio and Valmorara form one community, governed by 11 magiſtrates; though the number of voters, who appoint theſe magiſtrates, ſcarcely exceeds 40. The chief is called "Miniſtrale," and is confirmed every year, for which each voter receives a florin. About one-third of the merchandize from Como to Coire paſſes by Bevio; the greater part is ſent by Splugen.

BEUNTERSHEIM, a town of Germany, in the circle of the Upper Rhine, and biſhopric af Worms, 6 miles ſouth of Worms.

BEURATH, a town of Bohemia, in the county of Glatz.

BEURERIA, and Beurreria, in *Botany*. See Calycanthus and Ehretia.

BEURRE, in *Geography*, a town of France, in the department of the Doubs, and chief place of a canton in the diſtrict of Beſançon, 2 miles ſouth of Beſançon.

BEURRY, a town of France, in the department of the Meuſe, and chief place of a canton in the diſtrict of Bar-le-Duc, 1¾ league weſt of Bar-le-Duc.

BEURS, William, in *Biography*, a painter, was born at Dort in 1656, and diſcovering a natural genius for drawing and deſigning, he was placed, at the age of 18, under the inſtruction of William Drillenburg. He painted in the ſtyle and manner of his maſter, almoſt equalling him in the freedom of his hand, and the clearneſs of his colouring, and ſurpaſſing him in the correctneſs of his deſign. Addicting himſelf to a diſſolute life, he obtained neither the reputation nor the wealth which his talents, diligently exerciſed, might have enabled him to acquire. He painted portraits, landſcapes, and flowers. Pilkington.

BEUS, in *Ancient Geography*, a river of Macedonia, mentioned by Livy and Steph. Byz., near which was a town called Beur, *Beuc*, according to the latter.

BEUTHEN, or Nieder Beuthen, in *Geography*, a town of Germany, in the circle of Upper Saxony, and principality of Carolath, on the Oder, containing two churches; 3 miles S. W. of Ziegenbruck.

Beuthen, *Nieder*, a town of Sileſia on the Oder, in the duchy of Glogau. It has ſuffered much by war and fire; diſtant 13 miles W. N. W. from Ober Glogau. N. lat. 51° 42′. E. long. 15° 51′.

Beuthen, *Ober*, a town of Sileſia, formerly belonging to the principality of Jagerndorf, but ſince to the principality of Oppeln. It had anciently a productive mine of ſilver; diſtant 40 miles E. S. E. from Oppeln. N. lat. 50° 16′. E. long. 18° 53′.

BEUTSCHEN, a town of Poland, in the palatinate of Poſen, 44 miles weſt of Poſen.

BEUVRON, a town of France, in the department of the Calvados, and chief place of a canton in the diſtrict of Pont l'Evêque, 12 miles ſouth of Caen.—Alſo, a river of France, which runs into the Loire, 2 leagues below Blois.

BEUVRY, a town of France, in the department of the Straits of Calais, and chief place of a canton in the diſtrict of Bethune, half a league eaſt of Bethune.

BEVY, among *Sportſmen*, is uſed to ſignify a brood of quails. Thus alſo we ſay, a *covey* of partridges, a *nide* of pheaſants, and a *pack* of grouſe. *Bevy* is ſometimes uſed among foreſters to expreſs a herd of deer, though it is much leſs frequently uſed in this ſenſe than in the former.

BEUZEVILLE, in *Geography*, a town of France, in the department of the Eure, and chief place of a canton in the diſtrict of Pont-Audemer; 2½ leagues weſt of Pont-Audemer. It contains 2457 perſons, and the population of the canton amounts to 12,254. Its territory includes 192½ kilometres and 20 communes.

BEWCASTLE, a pariſh and village of Cumberland, England, is rendered intereſting to the topographer and antiquary from the Roman relics that have been diſcovered within its limits, and from the ſingular obeliſk in the churchyard. This pariſh is ſuppoſed to have included the Roman ſtation where part of the Legio-Secunda Auguſta was garriſoned to guard the workmen employed in erecting the famous Roman wall that ſeparated England from Scotland. Many veſtiges of ancient buildings are yet remaining; and numerous Roman coins, and ſome inſcribed ſtones, have been found here. The obeliſk, which has furniſhed a theme for much diſſertation, contains various ſculptured ornaments, with a Roman inſcription, and ſome figures in baſſo-relievo. The church, with the caſtle, are included within an entrenchment. The latter, now in ruins, appears to have been of a ſquariſh form, and was battered down by the parliament's forces in 1641. In this pariſh are two ſchools ſupported by ſubſcription, whoſe maſters have about ten pounds each per annum, with the privilege of a whittle gate. This was a peculiar cuſtom, formerly very common in Cumberland, and the neighbouring counties, and now prevails in ſome villages. It is a privilege given to the maſter of applying to his pupils' parents in rotation, for proviſions. Several thouſand ſheep and black cattle are fed on the hills and waſte pariſh. Hutchinſon's Hiſtory of Cumberland.

BEWDLEY, a market and borough town of Worceſterſhire in England, is pleaſantly ſituated on the banks of the river Severn, whoſe navigable ſtream has given proſperity to the place.

It

It was formerly included within the marshes of Wales, but by a statute of Henry VIII. was annexed to the county of Worcester. Leland describes this place as remarkable for the "wonderful height of the trees in the adjacent forest of Wyre," for its "beautiful situation," and for the palace of Tichen-hall, which Henry VII. built to be a place of retirement for prince Arthur. The ceremony of this prince's marriage in person, with Catharine of Arragon, by proxy, was performed here on the 19th of May, 1499. King Henry VI. gave all the stone for building the bridge across the Severn, which was erected by Edward IV. On the middle pier of this, stands a gate-house, part of which is for the corporation's prison.

The town is in the parish of Ribbesford, where there is an ancient moated house, in which was found the manuscript copy of the life of lord Herbert of Cherbury. Here is a chapel, which was built on the site of an ancient wood structure in 1748. A new set of shambles was also erected in 1783; and the town partakes of the benefits of a free grammar school, which was founded in the latter part of queen Elizabeth's reign; also some alms-houses, and a charity school. The manufactures and trades of this town were formerly very considerable, but they are now principally confined to tanning, hornwork, matting, and a few others. Bewdley seems to have been first incorporated by king Edward IV. whose charter grants the freemen great privileges and immunities by sea and land. These were confirmed by Henry VIII., and again by James I. This charter was surrendered in the time of Charles II.; but in the next reign another was granted, which on a trial in 1707, was determined to be void. A new one was therefore obtained from queen Anne, but this produced some litigation, which at length was determined in its favour. This empowers the bailiff and 12 capital burgesses to return one member to parliment. Here were formerly two weekly markets, on Wednesdays and Saturdays; but the latter is only continued; which, with three fairs, annually attract much company and trade to the town.

Bewdley is 129 miles N.W. from London. It contains 840 houses, and 3671 inhabitants. Nash's History of Worcestershire.

BEWITS, in *Falconry*, denotes a piece of leather to which a hawk's bells are fastened, and buttoned to his legs.

BEX, in *Geography*, a small town of Switzerland, in the canton of Berne, about 4 miles S.S.E. of Aigle, and 5 miles from the salt-works at Bevieux. (See Bevieux.) Between Aigle and Bex is a picturesque view of the castle of St. Tryphon, on the summit of an insulated rock in the middle of the plain; it is quite surrounded with wood, and realises Milton's description of an ancient castle,

"Bosom'd high in tufted trees."

It is said to be built of marble, and probably of a beautiful black species in the vicinity. St. Tryphon was a Phrygian, and is said to have suffered martyrdom at Nice in the year 251, under the persecution of the emperor Decius.

BEXUQUILLO, in the *Materia Medica*, a name given to the white *ipecacuanha*, which the Spaniards bring from Peru, as the Portuguese do the brown from Brasil.

BEY, or Beg, denotes a governor of a country, or town, in the Turkish empire.

The Turks write the word *legh* or *lel*, but they pronounce it *bey*: properly it signifies *lord*, but it is particularly applied to a *lord of a banner*, whom in the same language they call *sangiak-bey*, or *bey*; *sangiak*, which among them signifies *banner* or *standard*, being the badge of him who commands in an important place of some province, having under him a considerable number of spahis, or horse.

Each province in Turkey is divided into seven of these *sangiaks*, or *banners*, each of which qualifies a bey; and these are all commanded by the governor of the province, whom they also call *beghiler-beghi*, or *beyler-bey*, i. e. *lord of the lords*, or *beys* of the province.

These beys are, in a great measure, the same that *bannerets* formerly were in England.

It has already been observed, under the article Bashaw, that when the military aristocracy of the Mamlouks in Egypt was abolished by Selim, sultan of the Ottomans in 1507, he established a form of government, which was calculated to preserve all the different members of the state in a condition of dependence upon himself. With this view, he appointed, besides a pacha, a divan, or council of regency, composed of the pacha and the chiefs of the seven military corps. At the time of this appointment it was agreed, that the 24 governors, or beys of the provinces, should be chosen from the Mamlouks; and to them were entrusted the care of restraining the Arabs; superintending the collection of the tributes, and the whole civil government of the country; but their authority was purely passive, and they were to be considered merely as the instruments of the determinations of the council. By this institution, which is still observed in some instances, it was ordained, that the pacha should be contented to share the power of the beys, and that the duration of his authority should depend on their collective will. The power of the pacha was very extensive; but it has been gradually diminished, and almost annihilated by the intrigues and ambition of the beys. His jurisdiction was rather civil than military. He was always president of the divan, which was held in the castle where he resided. But that council has, in later times, commonly assembled in the palace of one of the chief beys, except when a firman or mandate is received from Constantinople, when the beys are summoned to the castle to hear the commands of the Porte. The few who attend, as soon as the reading is finished, answer, as is usual, "Esmâna wa taâna," "we have heard, and we obey;" but on leaving the castle, their general voice is "Esmâna wa awsêna," "we have heard, and shall disobey." All these beys had been Mamlouks, or military slaves, who were not natives of Egypt, but imported when very young from Georgia, Circassia, and Mingrelia, and purchased for 50, or not more than 100 sequins. Many of these are descended from Christian parents, and have been slaves from their youth. Some few have been prisoners, taken from the Austrians and Russians, who have exchanged their religion for an establishment. When the supply obtained in this way proves insufficient, or many have been expended, black slaves from Nubia, and other interior parts of Africa, are substituted in the room of the others, and if found docile, are armed and accoutred like the rest. The Mahometans in general, and the Egyptians in particular, treat their slaves with great kindness. At Cairo, when a slave is legally purchased in the market, if he feel discontented with his master, he has only to say, "carry me to the market," and the master is legally compellable to offer him for sale. The child of a female slave, begotten by her master, is "ipso facto" free, and a slave may authorize a free person to purchase his emancipation. The Christian children, bought by the beys, and the principal inhabitants of Cairo, are educated with the same care as their own children, in every thing necessary to accomplish the character of a Mahometan lord. They are instructed in every necessary exercise of agility and strength, and they are in general distinguished by the elegance and beauty of their persons. Some of them are excellent scribes; but many can neither read nor write. When their education is finished, they procure employments in the army; and after emancipation, their favoured slaves retain the most lively gratitude and affection

affection to the generous maſters, to whom they owe their fortunes, and both their political and moral exiſtence; nor do they ever quit them in the hour of danger. Thus it often happens, that a maſter, when he finds any of his ſlaves poſſeſſed of extraordinary talents, and tried fidelity, ſpares no pains or expence to raiſe him to a more conſiderable employment than that which he himſelf occupies; and thus he at length acquires ſovereign power. In order to attain this power, it is neceſſary to be a Mamlouk, that is, the native of a foreign country, as even the children of thoſe, who riſe to offices of ſtate, do not enjoy the right of ſucceſſion. Hence it happens, that as the ſon of a bey is not honoured with any particular conſideration, the women, perhaps, procure abortions. Of 18 beys, whoſe hiſtory was known to Mr. Browne, only two had any children living. Volney obſerves, that during 550 years Mamlouks have been in Egypt, and that not one of them has left ſubſiſting iſſue; but all their children periſh in the firſt or ſecond deſcent. Hence he infers, that thoſe who are transferred from the vicinity of mount Caucaſus, to the banks of the Nile, are incapable, by the influence of the climate, of perpetuating their progeny. To this circumſtance it is owing, that the Mamlouks are replaced by ſlaves brought from their original country. From the time of the Moguls, this commerce has been continued on the confines of the Cuban and the Phaſis, in the ſame manner as it is carried on in Africa, by the wars among the numerous tribes, and by the miſery of the inhabitants, who ſell their own children for a ſubſiſtence.

Diſtinguiſhed by favouritiſm or merit, the Mamlouk becomes a caſhef, or kiaſchef, and in time a bey. The chief cauſe of preference ariſes from political adherence to ſome powerful leader. The number of theſe beys has ſeldom or ever been complete; and the revenues of the vacant places were probably ſhared among the reſt, who were actual occupants of their office. Each of theſe beys is nominally choſen by thoſe that remain; but in fact appointed by one of the moſt powerful.

The "Yenk-tchery Aga," and ſeveral other officers, are enumerated among the 24 beys. Beſides being governors of certain diſtricts of Egypt, ſeveral of the beys receive other dignities from the Porte. Such are the "Scheik-el-belled," or governor of the city, which is an office merely civil, unaccompanied with any military power; the "Defterdar," or accountant-general; the "Emir el Hadj," or leader of the ſacred caravan; and the "Emir el Said," or governor of the Upper Egypt; which laſt two offices are annual. Theſe officers have alſo revenues allotted them by the Porte, ill-defined, and liable to much abuſe. Of the other beys, each appoints all officers and governors within his diſtrict, putting into it ſome ſlave of his own, who is compelled to render an account of the receipts; of which a part is appropriated to ſupport the grandeur of his maſter. An opulent bey may have from 600 to 1000 purſes annually; the revenue of Murad Bey more than double that ſum. The inferior beys may have 300 purſes, or 15,000 *l.* The revenues of the beys are raiſed by a land-tax and the produce of the cuſtoms, amounting together to near two millions ſterling, of which but a ſmall proportion reaches the coffers of the Porte. Every bey ſits in judgment on caſes of equity. Theſe perſonages are very obſervant of their reſpective juriſdictions; and no bey will impriſon a man liberated by another. Although ſometimes too impetuous, they nevertheleſs diſplay great acuteneſs and knowledge of characters. This government poſſeſſes at leaſt every advantage of publicity, as every bey is a magiſtrate. But the juſtice of the rulers is ever liable to the omnipotent influence of gold. Each bey appoints his caſhefs, or lieutenants. Theſe officers preſide each over a town or village, collecting the revenues, and judging ſmall cauſes; but an appeal lies to the bey. The beys and the caſhefs are, from their ignorance, conſtrained to employ Copts as accomptants in adjuſting and receiving the revenues, that duty being of an intricate nature, and requiring great local knowledge. The authority of a caſhef is as arbitrary as that of a bey.

The beys in Egypt have been gradually acquiring an increaſe of authority and influence, and reducing the power of the Ottoman Porte to a feeble and degraded ſtate. To this ſeveral circumſtances have contributed; ſuch as the unreſtrained traffic of ſlaves; the neglect of the affairs of this province on the part of the Ottoman Porte; the extenſion of the power of the divan, and the reſtraint of that of the pachas, and the conſequent uncontroulable influence of the janizaries and Arabs. To which may be added the change that took place in the condition of the ſoldiers, by their becoming citizens, and by the marriages they contracted, and the change alſo introduced into their diſcipline; and, more eſpecially, the permiſſion granted to the chiefs of poſſeſſing diſtinct property, lands, and villages, dependent on the Mamlouk governors, whom it became neceſſary to conciliate, in order to prevent their oppreſſion; and the aſcendancy acquired from that moment by the beys over the ſoldiers, and increaſed by the great riches accruing from their governments. Theſe riches they employed in multiplying their ſlaves; and, after emancipating them, advancing them in the army, and promoting them to various employments. By ſuch means Ibrahim, one of the kiayas or veteran colonels of the janizaries, rendered himſelf, in 1746, maſter of Egypt; for he had ſo multiplied and advanced his freedmen, that, of the 24 beys, which ſhould be their number, no leſs than eight were of his houſhold. His influence was alſo the more certain, as the pacha always left vacancies in the number, in order to receive the emoluments. On the other hand, the largeſſes he beſtowed on the officers and ſoldiers of his corps, attached them to his intereſt, and Rodvan, the moſt powerful of the Arab colonels, uniting with him, completed his power. The pacha became a phantom, and the orders of the ſultan vaniſhed before thoſe of Ibrahim. At length, about the year 1766, Ali Bey gained a decided aſcendancy over his rivals, and under the titles of "Emir Hadj," and "Scheik el Belled," rendered himſelf abſolute maſter of the country. (See Ali Bey.) Mohammed Bey, ſurnamed "Aboudahab," or father of gold, from the luxury of his tent and capariſons, who ſucceeded him in 1773, during a reign of two years, diſplayed nothing but the ferocity of a robber, and the baſeneſs of a traitor. Upon his death in 1776, Murad, a favourite of Mohammed, was advanced to the dignity of bey; but he had a formidable competitor in Ibrahim, who had been a ſlave of Ali Bey the Great. The two rivals, however, adopted conciliatory meaſures, and entered into an agreement to divide the authority, on condition that Ibrahim ſhould retain the title of "Scheik el Belled. This union was a prudential meaſure, and neceſſary to their ſafety; for ſince the death of Ali Bey, the beys and caſhefs, who owed their promotion to his houſe, repined at ſeeing all the authority transferred to a new faction; and after ſeveral intrigues and cabals, formed a confederacy, under the denomination of the houſe of Ali Bey. The chiefs of this confederacy were Haſſan Bey, formerly governor of Djedda, and Iſmael, the only remaining bey of thoſe created by Ibrahim Kiaya; and they conducted their plot ſo well, as to oblige Murad and Ibrahim to abandon Cairo, and retire as exiles into the Said. Theſe exiles, being reinforced by the refugees, returned, and compelled the confederates, Iſmael and Haſſan, to make their

eſcape

escape into the Said. Ibrahim and Murad have since ruled Egypt, the former as "Scheik el Belled," and the latter as "Defter-dâr," though not without mutual jealousies and attempts to destroy each other. They, however, conspire together to recruit the number of the Mamlouks, and to collect treasure from all quarters. In the year 1791, Salah Aga, a slave of Murad Bey, was deputed, from the government of Egypt, to negociate their peace with the Porte. He carried with him presents of horses, rich stuffs, &c. He was well received, and was afterwards appointed "Waquil el Sultan," i. e. agent or attorney to the sultan in Cairo. This office was probably given him to engage him in seconding the efforts of the court for disuniting the beys; but it was ineffectual. These had formerly experienced the evils of division, and were now united by common interest, grown rich, and well provided with slaves. It is said, that no tribute has since that time found its way to Constantinople. Ibrahim and Murad are considered as usurpers by the beys of Upper Egypt, who are favoured by the Porte. The most powerful house is that of Ibrahim, who has about 600 (according to Volney, but about 1000, says Mr. Browne,) Mamlouks. Next to him is Murad, who has not above 400 Mamlouks, says Volney; but according to Browne, they amounted, in 1796, to about 1700. He was originally a slave of Mohammed Bey, and succeeded in defeating and taking prisoner Ali Bey the Great. He is detested by the Porte. He is described by Sonnini, as handsome and martial in his appearance; his chin is covered with a bushy black beard; his thick eye-brows describe arches of ebony over his large eyes, which sparkle with vivacity and fire. A long scar in one of his cheeks adds to the fierce cast of his countenance. To great bravery, he joins singular address and extraordinary strength. He has been known, when riding by an ox, to cut off its head with one stroke of his scimitar. An intrepid warrior, capable of enduring the severest hardships, an excellent horseman, dexterous and powerful in the use of the sabre, courageous in adversity, bold in enterprise, cool in action, but terrible in onset. Murad, with instruction, might have become a great general. His proud deportment, and magnificent disposition, give him the dignified appearance of a sovereign; but injustice, ignorance, and cruelty, have rendered him a ferocious tyrant. Murad, says Mr. Browne, is one of those beys who can neither read nor write. Of the profusion of this bey, Sonnini has given the following account. In his camp were erected immense tents, divided into several apartments, for the accommodation of himself and his principal officers. The floors were covered with the most beautiful carpets, and the interior decorations consisted of the richest gold and silver stuffs that the manufactories of Lyons could afford. Nothing could equal the magnificence of his cavalry. Gold and silver ornaments, with the choicest embroidery on Morocco leather, glittered with a dazzling lustre in the rays of a burning sun; and the housings of the saddles, trimmed with a broad gold lace, were made of those handsome velvets, the small and delicate patterns of which display the elegant taste that prevails in the productions of the manufacturers of Lyons. His profusion is supplied by his rapacity. He is accustomed to have from the mint daily, for his pocket expences, 500 half mahbûbs, and his wife the same. This amounts to 1500 piastres, and is only a small part of his disbursements. He is married to the widow of his master, the daughter of the celebrated Ali Bey. Next in power to Murad, is Mohammed Bey Elfi, whose name imports that he was bought for 1000 patackes. His master was Murad Bey, just mentioned. He is represented as quick in apprehension, and impetuous in action. His power is great and increasing; he has 800 Mamlouks. Ibrahim Bey, "el Uali," a name derived from the second military magistracy in the city of Cairo, is a young man about the same age with the last mentioned, of a sedate, but firm character, married to the daughter of the elder Ibrahim, and attached to his interests. He has 6 or 700 Mamlouks. Aiûb Bey, "al Zogheir," or junior, is another powerful leader, distinguished by his superior capacity, and on all occasions consulted by the rest. He has not many Mamlouks; he is prudent and economical, and rarely accused of extortion. Fâtmé, now the aged daughter of the famous Ali, is held in much respect by all the beys. Even Murad, her husband, treats her with reverence. When a bey is appointed to a government, he never fails to pay a visit to this old lady, who lectures him on his duties, and will say to him, "Do not pillage the people; they were always spared by my father."

Of the systematic rapacity of the beys, the following instance is mentioned. Ibrahim Bey, at a festival occasioned by the marriage of his daughter to another powerful bey in 1792, invited to his house a famous singer, who had been employed, during the preceding day and night, in the exercise of her profession, and who had received considerable donations. She readily complied, expecting employment, and liberal recompence. The bey asked her "How many half sequins did you collect yesterday?" She replied, "about ten thousand." "Pay me eight thousand then," said the bey, "and I will give you a note of credit on Ibrahim Jeuhari, my secretary." The money was paid, but the woman was turned out of the house without receiving any security whatever; and is said to have died of the disappointment. Volney's Travels through Syria and Egypt, vol. i. Sonnini's Travels in Upper and Lower Egypt, p. 424, &c. Browne's Travel's in Africa, &c. p. 47, &c. See BASHAW, and MAMLOUK.

BEY *of Tunis*, denotes a *prince*, or *king* thereof; answering to what at Algiers is called the *dey*. He is chosen out of the army; each order, even the most inferior, having an equal right and title to that dignity with the highest.

In the kingdom of Algiers, each province is governed by a bey or vice-roy; who is appointed and removed at pleasure by the bey; but has a despotic power within his jurisdiction; and at the season for collecting the tribute from the Arabs, is assisted by a body of troops from Algiers.

The kingdom of Tunis is not divided into provinces, like that of Algiers, and governed by provincial beys, or vice-roys; but the whole is under the immediate inspection of the bey himself, who collects the tribute in person. For this purpose, he visits, with a flying camp, once every year, the principal parts of it; traversing, in the summer season, the fertile country in the neighbourhood of Kesf and Baijah; and in the winter, the several districts betwixt Kairwan and the Jereed.

BEYAH, in *Geography*, anciently called *Beypassa*, and the *Hyphasis*, or *Huphasis* of Alexander, a river of Hindoostan, that rises in the great chain of snowy mountains, extending from Sirinagur, to the north of Cashmere, or the ancient Imaus; and after traversing the Panjab, it joins the Setlege at Ferosepour; about 24 miles below the confluxs, a separation again takes place, and four different streams are formed; the northmost and most considerable of which recovers the name of Beyah, and is a deep and rapid river. The others are named Herari, Dond, and Noorney; and near Moultan they unite again, and bear the name of Setlege, until both the substance and the name are lost in the Indus, about 80 miles, or three days' sailing, by the course of the river, below the mouth of the Chunaub. Rennell's Mem. p. 102.

BEYENBERG, or BIENBERG, a town of Germany, in the

the circle of Weſtphalia, and duchy of Berg, on the Wipper, 3 miles north of Lennep.

BEYERLAND, an iſland belonging to Holland, ſituated on the Meuſe, with a town of the ſame name; 4 leagues weſt of Dort.

BEYERN, a town of Germany, in the circle of Swabia, and county of Fuſtenberg, ſituated on the Danube, 4 leagues from Dutlingen.

BEYHARTING, a town of Germany, in the circle of Bavaria, 24 miles E.S.E. of Munich.

BEYKE. See Beki.

BEYLA, a town and diſtrict of Abyſſinia, in Sennar, about 11 miles weſt of Teawa, and 31½ miles due ſouth, in N. lat. 31° 42′ 4″. Between Teawa and Beyla there is no water. Imgededema, and a number of villages, were ſupplied with water from wells, and had large crops of Indian corn ſown about their poſſeſſions. But the Arabs Daveina have deſtroyed theſe places, filled up their wells, burnt their crops, and expoſed all the inhabitants to die by famine.

BEYMONT, or Beywort, a town of Germany, in the biſhopric of Liege, 8 miles ſouth of Liege.

BEYNAT, the chief place of a canton, in the diſtrict of Brives, and department of Correze, containing 1462 inhabitants; thoſe of the canton being 5488. The territory comprehends 135 kiliometres and 6 communes.

BEYS, Gilles, in *Biography*, a printer at Paris, in the 16th century, who firſt introduced into his editions the diſtinction ſuggeſted by Ramus in his grammar between *j* and *v* conſonants, and the vowels *i* and *u*. He died in 1595.

BEYSZKER, *(Geſn. Thierb.)* in *Ichthyology*, a name of the *cobitis foſſilis*. Gmelin.

BEZA, Theodore, or Theodore de Beze, in *Biography*, an eminent divine among the firſt reformers in Geneva, was born of parents nobly deſcended, in 1519, at Vezelai in Burgundy, and ſent by his uncle, who was a counſellor in the parliament of Paris, to Orleans, in 1528, to be educated by Melchior Wolmar, a proteſtant and an excellent teacher. Having continued ſeven years under his tuition, he commenced the ſtudy of the law at Orleans; but his taſte led him to the cultivation of polite literature, and he compoſed ſeveral Latin poems, which were conſidered by the learned as a promiſing ſpecimen of his talents. After taking a law-degree, he returned, in 1539, to Paris, where his parents, who had intended him for the eccleſiaſtical profeſſion, had procured for him a valuable abbacy. Addicted to the delights of an eaſy and voluptuous life, he remained for ſome years at Paris; but under the influence of ſentiments imbibed in his youth from his proteſtant preceptor, he determined ſooner or later to break his fetters. A marriage contracted from conſcientious motives rendered it neceſſary for him to reſign his benefices, and haſtened in the execution of his purpoſe by the reflections attending a ſevere illneſs, he and his female companion fled, in 1548, to Geneva. In the following year he accepted the offer of a Greek profeſſorſhip at Lauſanne, in the exerciſe of which he continued with reputation for nine or ten years. Here he read lectures in French on the New Teſtament, and publiſhed ſeveral books; one of which was a tragi-comedy, in French, entitled "Abraham's Sacrifice," which paſſed through ſeveral impreſſions. Having frequent opportunities of viſiting Calvin at Geneva, he was induced by his perſuaſion to finiſh the verſion of the Pſalms, which had been begun by Marot. During his reſidence at Lauſanne, he publiſhed a treatiſe, "De Hereticis à Magiſtratu puniendis," in reply to a book written by Caſtalio, after the execution of Servetus; and in this treatiſe he maintained a doctrine no leſs dangerous in its tendency than inconſiſtent with his principles as a reformer and proteſtant, that it was the duty of the civil magiſtrate to puniſh hereſy. He alſo wrote on predeſtination, and the euchariſt, in oppoſition to the Lutherans, and others, and in a ſtyle of raillery which a maturer judgment and after-reflection led him to correct. In 1558, he was ſelected as one of the deputies commiſſioned by the proteſtants, to engage the German princes in favour of their brethren impriſoned at Paris, and of the perſecuted inhabitants of the vallies of Piedmont. In the following year he removed to Geneva, where he became the colleague of Calvin, both in the church and univerſity, and where by his abilities, learning, and zeal, he co-operated with him in advancing the reformation. In 1561, he diſtinguiſhed himſelf by his eloquence on behalf of the proteſtant party, at the conference of Poiſſy; although he gave offence by his declared oppoſition to the doctrine of the real preſence. Continuing in France, he attended the prince of Condé as a miniſter, when the civil war broke out, and accompanied him to the battle of Dreux. Upon his return to Geneva, in 1563, he wrote ſeveral books in theological controverſy, with an acrimony that cannot be juſtified by perſons of moderation and candour. In 1571, he officiated as moderator in the national ſynod of Rochelle, and in the following year aſſiſted in that of Niſmes. In 1586, he held a diſputation with Andreas, a Lutheran divine of Tubingen; and through the whole courſe of his life, the party to which he belonged availed itſelf, on many occaſions, of his talents and reputation. Having loſt his firſt wife in 1588, he ſoon married another. Although the infirmities of his advanced age required his withdrawing from the duties of public inſtruction, the ardour of his genius remained to the cloſe of his life, and he wrote Latin verſes a few years before his death, which happened in October 1605, after he had paſſed his 86th year. Of his ſingular natural talents and literary acquirements no doubt can be entertained; nor need we wonder that bigotted Catholics ſhould have calumniated him whilſt he lived, and reviled his memory after his death. He has indeed, by his enemies, been unjuſtly traduced as a hypocrite, and a perſon of lax morals; but charges of this kind are refuted by the uniform tenour of his life. His partial advocates, however, muſt regret that, as a diſputant, he was violent, impetuous, and dogmatical, and deficient in candour and charity. His juvenile pieces, in Latin poetry, in which critics have detected many numerous deviations from claſſical purity, were firſt printed in 1548. Some of theſe, with corrections, together with others of a more ſerious caſt, were printed by the Stephenſes at Paris, in 1597, 4to. under the title of "Theod. Bezæ Poemata varia." His French works are of an inferior kind. His theological works are numerous. Of theſe, the moſt generally read, and the moſt highly eſteemed, is his "Latin verſion of the New Teſtament," with critical and theological remarks. For an account of the MS. in his poſſeſſion, ſee Cambridge MS. Gen. Dict.

BEZABA, in *Geography*, a river of Spain, which runs into Orio, in the province of Guipuſcoa.

BEZABDA, or Gozerta, *Geziret ebn-Omar*, in *Ancient Geography*, a town of Aſia, on the right bank of the Tigris, ſouth-weſt of Tigranocerta, in the country called Zabdicana.

BEZANT, repreſents, in *Heraldry*, round flat pieces of gold. They were firſt borne by the ſoldiers of the holy wars, being the current coin of Byzantium (the modern Conſtantinople), with which the ſtipends of the army were diſcharged, and from whence they took their name. They are always emblazoned gold, but the foreign heralds make them both gold and ſilver.

BEZANTIE, is when the field is powdered with bezants, or when ſupporters, or creſts, are ſtrewed with them. The proper heraldic term is bezantie. When a

bordure is charged with eight bezants, that being the limited number, you need not express the number, but say, *a bordure sable bezantée*.

BEZANTLIER, signifies the second branch of the horn of an hart or buck, that shoots from the main beam, and is the next above the brow-antler.

BEZARA, in *Ancient Geography*, a town of Galilee near the sea, south of Ptolemais.

BEZDELKINO, in *Geography*, a town of Siberia, 80 miles north of Balaganskoi.

BEZDZIEZ, a town of Lithuania, in the palatinate of Brzesc, 24 miles west of Pinsk.

BEZE, a town of France, situate near the source of a river of the same name, in the department of the Côte d'Or, and chief place of a canton, in the district of Is-sur Tille, 2½ leagues E.S.E. of of it.

BEZEK, or Bezaka, in *Ancient Geography*, the place where Saul reviewed his army, before he marched against Jabesh-Gilead. 1 Sam. xi. 8. Eusebius mentions two cities of this name, near one another, 7 miles from Sichem, in the way to Scythopolis.

BEZENSTEIN, or Petzenstein, in *Geography*, a town of Germany, in the circle of Bavaria, and territory of Nuremberg, 19 miles N.E. of Nuremberg.

BEZER, in *Ancient Geography*, a city beyond Jordan, over-against Jericho, in the wilderness, assigned by Moses to the tribe of Reuben, intended by Joshua to be a city of refuge, and given to the Levites of Gershom's family. Deut. iv. 43. Josh. xx. 8. The vulgate in both places denominates it *Bosor*. Eusebius confounds it with Bostra of Arabia, which lay much farther to the east. See Bostra.

BEZETH, a city of Palestine, on this side Jordan, in the vicinity of Jerusalem, which Bacchides surprised, and the inhabitants of which he threw into a pit; probably the same with Bezeceath. 1 Maccab. vii. 19.

BEZETHA, or Betzeta, a division or part of Jerusalem, situated on a mountain, and encompassed with walls, being, as Josephus says, a new city attached to the old one, and called in Greek Καινόπολις, Cainopolis. It lay north of Jerusalem and the temple.

BEZETZ, in *Geography*. See Beshetsk.

BEZIHLEN, a town of Transylvania, 12 miles N.N.E. of Bistriz.

BEZIERS, a city of France, and principal place of a district, in the department of the Herault, seated on the left bank of the Orbe, not far from the grand canal. Before the revolution, it was the residence of a governor, and a see of a bishop, suffragan of Narbonne; its cathedral was small, but beautiful; it had besides a collegiate church, several religious houses, two hospitals, a college founded by the inhabitants in 1599, and an academy of sciences and belles lettres. It is surrounded by a wall, flanked with old towers, and decayed bastions. The number of inhabitants in both its sections is estimated at 14,211, and the population is small in proportion to its extent. The canton of the first section has 11,306, and that of the second 13,147 persons. The former canton has 9, and the latter 7 communes. The territorial extent of both comprehends 360 kiliometres. The situation is beautiful, and it commands a view of several sluices of the grand canal of Languedoc. In the Not. Imp. it is called "Civitas Biterensium, Bliterra Septimanorum." In the 5th century it was ravaged by the Vandals; by the Saracens, in 720; by Charles Martel, in 737; and by Simon, count Montfort, in 1209; who, in the crusade against the Albigenses, took it by assault, and put more than 150,000 of the inhabitants to the sword. Since this time it has not recovered its ancient lustre. It was re-united to the crown by S. Louis, in 1247. Its territory is fertile in corn, oil, and wine. It has also mineral waters. N. lat. 43° 20′ 41″. E. long. 3° 12′ 35″.

BEZIRA. See Bazira.

BEZOAR, Bezoard, primarily denotes an antidote, or counter-poison. The word is formed from the Persian *pazahar*, which denotes the same, *pa* signifying *against*; and *zahar*, *poison*.

Bezoar, *Lapis Bezoardicus*, is a term applied in a general way to various substances found in the stomach, intestines, and other internal cavities of the bodies of quadrupeds.

The true bezoar, however, is a calculous concretion, usually formed in the stomach of some of those animals which ruminate, or chew the cud. There are two sorts of the bezoar stone; one is brought from the East Indies, and Persia, and thence known under the name of *Oriental* bezoar. The other kind comes from the Spanish West Indies, or South America, and is called *Occidental* bezoar. The Oriental is considered by far the more valuable kind, and is exceedingly scarce, even in India. The larger the stone the more highly it is esteemed; its price increasing, like that of the diamond, in proportion to its size. A stone of one ounce has been sold in India for 100 livres, and one of four ounces and a quarter for 2000 livres. The price of the smaller stones, in Germany, in the year 1600, was from 16 to 32 ducats the ounce; but it had then much declined. The larger bezoars had no regular price, being often enormously dear. As long as it retained its fancied reputation, as an antidote to every kind of poison, and as a cordial for the support of life under the most trying circumstances of disease, its price was advanced beyond its weight in gold, and it found a high place for many centuries among the most costly collections of precious stones. The size varied from that of a pea to a hen's egg, or even larger. Boetus relates, that in his time, the emperor Rodolph II. possessed one of the size of a goose's egg, which he ordered to be hollowed out into a cup, when the nucleus was found to be a small mass of herbs still strongly aromatic. The most anciently known bezoar stones were procured from the stomachs of goats feeding in the mountains of Persia, and those from the mountain goat were in such high request, that the emperor Shah-Abbas (who died in 1628,) claimed all above a certain standard as a royalty, and appointed collectors for the purpose. The Oriental bezoars passed through the hands of the Armenian and Persian merchants, and were formerly brought to Europe in considerable quantities. In the east, those were the most esteemed that were obtained from goats feeding in the mountains, as the aromatic herbs found there were supposed to add much to the virtues of the calculus.

Authors disagree with respect to the animal in which the [illegible] Oriental [illegible] found; some [illegible] to a species of goat, others to the antilope genus. Most naturalists allow this substance to belong to the gazelle, (*Antilope Gazella*, Gmel.) Aldrovandus calls this species of antilope, *hircus bezoardicus*; Linnæus, *capra bezoardica*; and Pennant, the *bezoar antilope*. Pallas, however, in his Spicilegia Zoologia, gives the same name to the Egyptian antilope, (*Antilope Oryx*, Gmel.) Cuvier describes the Oriental bezoar as being found in the intestines of the capra ægagrus of the Linnæan system, and Gmelin ascribes it to the *capricorne* goat. By the account of Clusius, the animal furnishing this concretion would seem to be larger than the goat, and more resembling the Nylghau. There can be little question but similar substances have been occasionally met with in each of these animals, and in several other species.

The bezoar stone, when genuine, varies much in its form; this depending upon the figure of the nucleus, upon which the calculous matter is deposited, there being generally some foreign

foreign body in the centre of the bezoar. The ſubſtances which uſually ſerve for nuclei to theſe concretions are ſtraw, hair, ſmall pebbles, nuts, hard ſeeds, ſtones of fruit, &c. but the moſt frequent nucleus of the real oriental bezoar, is the pod of a fruit, much like that of the ACACIA *vera Egyptiaca:* though it at firſt ſight reſembles a *caſſia*, or tamarind ſtone. In ſome of the bezoar ſtones formed on this fruit, the outer membrane of the bean having periſhed, and the bean ſhrunk in drying, there remains a vacuity between it and the inner ſurface of the bezoar, ſo that it rattles within it, when ſhaken, in the manner of an *ætites*, or *eagle ſtone*. It is of little moment what the figure or nature of the body may be, which is to ſerve the purpoſe of a nucleus, as it cannot, in the ſlighteſt degree, affect the quality of the calculous ſubſtance which is to be collected on its ſurface; any extraneous matter will ſuffice for this purpoſe, which may happen by any accident to be long enough detained in the ſtomach or inteſtines. The formation of bezoars appears to be effected in a manner ſimilar to that obſerved in the production of the calculi of the urinary bladder of the human ſubject. We may preſume that the bezoar is only formed when there is a tendency in the animal to generate an extraordinary quantity of calculous matter; for if it were otherwiſe, as that theſe ſubſtances were produced by any combination of the ordinary contents of the ſtomach and inteſtines, what animal, that is liable to ſuch collections, could ever be without them? whereas, on the contrary, they are ſo ſcarce in the Eaſt Indies, that thoſe which are brought into this country are ſuppoſed to be in general artificial compoſitions; nay, ſome have doubted if we ever meet with a genuine oriental bezoar in this country.

The ſeaſon of the year alſo appears to influence their production. Camerarius remarks, that theſe bodies begin to form towards the month of November: and when the Pariſian anatomiſts diſcovered a bezoar in the ſtomach of the Chamois *(Antilope Rupicapra,)* it was the month of December.

The number of bezoar ſtones varies, in different animals, from one to ſix; hence, it is ſaid to be cuſtomary, previous to purchaſing a bezoar animal, to reckon the number of ſtones it contains, which can be aſcertained by feeling externally, and by this the price of the animal is regulated.

Velchius aſſerts, that the bezoar is only found in the firſt or ſecond ſtomachs of ruminant animals, but the anatomiſts of the French academy ſtate, that they met with it in the third ſtomach; and others have mentioned its being ſometimes ſituated in the inteſtines.

All bezoars are made of concentric layers, or by ſtratum ſuper ſtratum, after the manner of the common urinary calculus. This proves their formation to be gradual; and as this mode of increaſe cannot be eaſily imitated, it is probably one of the beſt marks for diſtinguiſhing the genuine bezoar from that which is counterfeited.

The Oriental bezoar is ſmooth and gloſſy on the ſurface, the colour a dark green or olive; on removing the outer coat, that which lies next it appears likewiſe ſmooth and ſhining; it is generally leſs than a walnut; it is moſt eſteemed for its medicinal properties, and is the only ſort retained by the London college. The Edinburgh college, in ſome of the former editions of their pharmacopœia, directed both this and the occidental bezoar, but they now ſeem to allow them to be uſed promiſcuouſly, retaining in their catalogue only the name of *lapis bezoar*.

The imitations of this ſtone have been carried to ſuch perfection, that as far as reſpects form, colour, or other external characters, the deception cannot well be detected. Mr. Neumann ſuppoſed that thoſe which come neareſt the genuine bezoar, are a compoſition of plaſter of Paris, chalk, or other earths ſtained of the proper colour by ſome vegetable tincture. Thoſe which are palpably counterfeited, are compoſed chiefly of ſome reſinous ſubſtance, and may be eaſily diſcovered by their liquefying in the fire, and being ſoluble in ſpirits of wine; he never could diſcover any mark of an animal nature in any of theſe. Chemical works, by Dr. Lewis, p. 533, &c.

The modes of trying if bezoar be genuine are, 1ſt. To immerſe a portion of it, for ſome hours, in moderately warm water, when the water ought to remain untinged, and the ſtone undiminiſhed in its weight: 2d. to apply to it a ſharp red hot iron, which it ſhould reſiſt without frying or ſhrivelling: the 3d. which is conſidered the moſt certain experiment, is to rub the bezoar over a paper which has been previouſly ſmeared with chalk or quicklime: if it leave a yellow tint on the former, or a green one on the latter, there is no doubt of its being genuine.

The *occidental bezoar* is uneven on the ſurface; of a dirty green colour; it is heavier and more brittle than the oriental, to which it is conſidered much inferior in value; it is of a looſer texture, and when fractured, the layers appear thicker, and exhibit a number of ſtriæ curiouſly interwoven. It is alſo found of a much greater ſize; ſometimes being as large as a gooſe's egg.

The occidental bezoar has been found in ſome of the camel tribe, eſpecially the *guanaco*, *Camelus Huanacus* and the *Vicuna (Camelus Vicugna,)* which are inhabitants of South America.

This kind of bezoar, Mr. Neumann apprehends, is more likely to be an animal production than the other, becauſe it yielded, on diſtillation, a ſmall portion of volatile urinous matter. Chem. Works, p. 537.

The analyſis of bezoar ſtones, as related by different chemiſts, is very contradictory, which has given riſe to the opinion of the ſpecimens which they ſubmitted to experiment, being ſpurious. Thoſe ſtones examined by Slare, as oriental bezoar, did not diſſolve in acids. Thoſe which Grew and Boyle made trial of, did. Thoſe employed by Geoffroy (in ſome experiments related in the French Memoirs, 1710,) did not ſeem to be acted on by ſpirits of wine, whilſt thoſe ſpecimens examined by Neumann, at Berlin, almoſt entirely diſſolved in ſpirits. For an account of the analyſis and chemical properties of the bezoar and ſimilar ſubſtances; ſee CALCULUS.

In the early ages, when a knowledge of diſeaſes was conſidered an occult and myſterious ſcience, rare and unknown plants, or unuſual, and what were conſidered wonderful animal productions, were chiefly employed in the way of medicines; at this period we accordingly find the bezoartic ſtone poſſeſſed great reputation as a remedy for many diſeaſes; it owed, no doubt, much of its fame to the fabulous accounts which were related with reſpect to its origin.

It was not known to the Greeks. The firſt perſon who has mentioned it was *Avenzoar*, an Arabian phyſician. He deſcribes it to be generated of the tears, or gum, of the eyes of ſtags, who, after eating ſerpents, were accuſtomed to run into the water up to the noſe, where they ſtood till their eyes began to ooze a humour, which collecting under their eye-lids, gradually thickened and coagulated, and when it became quite hard was thrown off by the animal rubbing itſelf againſt the trees. Other ſtories concerning the hiſtory of the bezoar, equally wonderful and ludicrous, were credited, until the time of Garcias al Horto, phyſician to the Portugueſe viceroy of the Indies, who gave the firſt true account of the origin of this ſubſtance. Kempfer afterwards gave a deſcription of it with ſome new particulars.

The bezoar was firſt employed to prevent the fatal conſequences of poiſon. This is expreſſed by the very name which

which is derived from the Persian word *badzehr*, or *bazehr*, *antidote*, or from *pazahar*, of which *pa* signifies *against*, and *zahar*, a *poison*. Others derive the term bezoar from the Persian *pazar*, a goat.

It was afterwards given in vertigoes, epilepsies, palpitations of the heart, jaundice, colic, and a great many other diseases; so that if its real virtues were answerable to its reputed ones, it was doubtless a *panacea*. Even later writers have bestowed extraordinary commendations on it, as a sudorific and alexipharmic; but there is every reason to doubt its possessing any such virtues. It is an earthy substance, devoid of taste or smell. The history of its formation proves that it is not digestible, or otherwise affected by the juices of the intestinal canal. If it can ever be employed as a medicine, it should be on account of its absorbent quality, which, however, it appears to possess but in a very slight degree. It has been administered to patients in the quantity of half a drachm, and in some instances a drachm has been taken, without producing any sensible effect: the dose has been generally fixed at a few grains, which was probably on account of its scarcity and great price. While it retained its medical reputation, it was said to act as an antidote to every poison, vegetable or mineral, and to the bite or sting of all poisonous animals, in the dose of about 8 grains; but it would equally prove a counter-poison when taken regularly in the quantity of two grains daily, in a glass of wine, or especially of distilled water of carduus benedictus. To preserve an youthful constitution and vigour, an oriental's recipe is to take twice a year (purging being premised) ten grains of bezoar daily, for five successive days, with a cup of rose-water. Bezoartic productions are at present so little regarded for their medicinal properties, that few druggists now think it necessary to have them in their possession.

Bezoar, *Equinum*, is the name given to the calculous concretions occasionally met with in horses. They appear to be formed in the same manner as the bezoar of the antilope or [illegible]. They grow to a considerable size; have usually an irregular form, something between a compressed sphere and a rhomboidal figure; when divided, they exhibit the usual succession of strata, of which they are composed, but which are not so distinct as in the other bezoars; each layer is formed of excentric striæ, which are in many places more evident than the division into strata; consequently the section of the bezoar gives the appearance of its having been made of radiated, rather than concentric layers. The surface of the calculus bears great resemblance to a piece of polished lime-stone.

Bezoar, *German*, is called by some *cow's egg*, from the circumstance of its being occasionally found in the stomachs of cows, but the animal from which it is most commonly obtained is the chamois (*Antilope Rupicapra*).

The nucleus of the German bezoar is either the hair which the animal may have swallowed, when licking itself, or the fibres of undigested vegetables, which are rolled into a round smooth ball. The quantity of calculous substance which is collected upon this ball is in general very trifling, often being merely a thin pellicle.

The bezoar which was found in the chamois by the Parisian academicians, was made up of the woody fibres of the plants the animal had eaten; it was smooth and besmeared with mucus on the surface; and was broken at one end, exposing a cavity in the centre of the ball, which had formerly, no doubt, been occupied by some solid substance, such as a pebble, or stone of some fruit.

German bezoars have been found, according to Bartholin, and others, in horses and sheep, in which last they are chiefly composed of wool, which these animals accidentally swallow.

From these species of bezoar having little, if any, calculous matter in their composition, they have been called by some writers, with propriety, *Ægagropilæ*; which see, and Balls.

Besides what have been already described, there are concretions found in the gall bladder of animals, to which the term *bezoar* has been applied; these appear to be no other than biliary calculi.

The *Hog* or *Boar* Bezoar, called by the Dutch *Pedra de porco*, and by the Portuguese, who first brought it into Europe, *Pedro de vaparis*, is found in the gall bag of an East India boar; in form and magnitude it resembles a filbert, though more irregular; it is most commonly white, with a tinge of green; the surface is smooth and shining, and is valued at ten times its weight in gold.

The Indians attribute extraordinary medicinal powers to this bezoar. They call it *Mastica de soho*, and prefer it to that obtained from the Gazelle; they consider it a sovereign remedy for the *mordoxé*, a disease to which they are liable, and which is not less dangerous than the plague in Europe. They allow it to have great efficacy also in malignant fevers, small-pox, and most diseases of women not with child, it being supposed to produce abortion in those who are pregnant, if they use it indiscreetly. When it is to be used as a medicine, it is infused in water or wine, until it has communicated a little bitterness to it. To facilitate the infusion, and at the same time preserve so precious a stone, they usually inclose it in a gold case, which is pierced with holes.

The *Porcupine* and *Monkey* Bezoars, are also the biliary calculi of these animals. Tavernier asserts, that they are not taken from the gall bladder, but the heads of the ape and the porcupine, which is highly improbable, and contrary to general anylysis; he calls them *Malacca stones*, and says that they are held in such estimation by the inhabitants of Malacca, that they never part with them, except as presents to ambassadors, or the greatest princes of the East.

According to Neumann, single stones, taken from the porcupine or monkey, have been sold for sixty and eighty pounds sterling.

It is not impossible but that those bezoars which are formed in the gall bladder may possess some power as medicines; perhaps also solutions might be employed with advantage in surgery, but their great reputation amongst the Indians seems to arise altogether from ignorance and superstition.

Bezoar, *bovinum*, is a yellowish stone, found in the gall bags of the ox. It has been used by miniature-painters in several casts of yellow.

Bezoar, in *Conchology*, a species of Buccinum, that inhabits China. This shell is subrotund and rugose: anterior part of the whorls lamellated: pillar perforated. Gmelin. The colour is dirty ochraceous, varied with brown: within yellow; coarse, decussated with wrinkles, or striæ; tail solid, bent, rugose with imbricated scales: spire angular with straight sides: anterior part flattish, plaited, or dentated above.

BEZOARA, or Buzwara, in *Geography*, a town with a fort in the peninsula of India, situate on the north side of the Kistna river, distant 403 geographical miles from Masulipatam. N. lat. 16° 33′. E. long. 80° 39′. In the town is a magnificent pagoda, and another stands on an eminence without it; which attract a great number of pilgrims, whose contributions are distributed in alms to the poor.

BEZOARDICS. The peculiar virtue of the bezoar being that of resisting and expelling poisons; the term *bezoardic* (now, however, nearly obsolete,) has come to be almost synonymous with *antidote*. Thus, when a bezoardic medicine is mentioned, it implies, with the older writers, either a

medicine into which bezoar enters, or one that resembles the bezoar in its supposed power of counteracting poisons, or afterwards, simply, a cordial. A few metallic preparations have had this appellation.

BEZOARDICA Capra, Syst. Nat. *Hircus bezoardicus*, Aldr. *Animal bezoarticum*, Raj. *Bezoar Antelope*, Pennant, &c. names of the *Antilope Gazella*. Gmelin.

Bezoardica *terra*, a name used by some authors for a medical earth dug in the pope's territories, and more frequently called terra *noceriana*.

BEZOARDICUM Minerale, or *Mineral* Bezoar, is a perfect oxyd of antimony, made by adding nitrous acid to the butter of antimony, and described under the article Antimony.

Bezoardicum *Joviale*, is a mixed oxyd of antimony and tin, formed by fusing together these metals, distilling with corrosive sublimate to convert both metals of the alloy into a *butter*, or muriated oxyd, and adding nitrous acid to reduce them both to a perfect simple oxyd. It is entirely disused.

BEZOLA, in *Ichthyology*, the name of a kind of *Salmo*, called by Gesner Albula cærulea, and supposed to be in no respect different from *Salmo Lavaretus*.

BEZOUT, Stephen, in *Biography*, a celebrated mathematician of France, was born at Nemours, March 19, 1736, O. S. and notwithstanding opposition on the part of his father, devoted himself to the assiduous prosecution of the mathematical sciences, to which his taste strongly inclined him. In 1758, he was appointed adjunct mechanic to the Paris academy of sciences, after having communicated two memoirs on the integral calculus, and affording other proofs of his proficiency in the mathematics; in 1763, he was nominated examiner to the marine; associate to the academy in 1768; and, in the same year, member of the academy of marine affairs, and examiner of the pupils of the royal corps of artillery; and, in 1776, royal censor. His particular attention was directed to the solution of algebraic equations, and he had the honour of first discovering a method of resolving a particular class of equations of all degrees. In this work of investigating the roots of such equations, he was occasionally engaged from 1762 till 1779, when he published his treatise on the subject. To distinguished talents, and elaborate researches in the abstruser parts of mathematics, Bezout added an assiduous discharge of the duties of the public stations which he occupied, and a private character which was deservedly esteemed. The following anecdote furnishes a pleasing specimen of his regard to justice in the exercise of his office, and at the same time of the benignity and condescension of his temper. When two of his pupils were confined by the small-pox, and incapable of attending for the purpose of an examination, the want of which would have delayed their advancement for a whole year, he ventured, though he had never had that disorder, to visit them in person, and to ascertain their proficiency, by which he was enabled to make a report in their favour. His constitution was at length impaired by his unremitting application, the fatigues of his various offices, and some personal chagrins; and he fell a sacrifice to a malignant fever, September 27, 1783, in the 54th year of his age. His publications were "A Course of Mathematics for the Use of the Marine, with a Treatise on Navigation," 6 vols. 8vo. Paris, 1764; a "Course of Mathematics for the Corps of Artillery," 4 vols. 8vo. 1770; "General Theory of Algebraic Equations," 4to. 1779; with a considerable number of Memoirs, chiefly mathematical, in the volumes of the French Academy. Montucla, Hist. des Mathem. vol. iii. p. 47. 298. Hutton's Math. Dict. Art. Bezout.

BEZOZZI, Alexander and Jerom, brothers in the service of the king of Sardinia, at Turin, the most celebrated performers of their time; the one on the hautboi, and the other on the bassoon. These kindred instruments were rendered famous all over Italy during the middle of the last century, not only by the exquisite performance, but by the amiably singular character of these two brothers. Their long and uninterrupted affection and residence together, were as remarkable as their performance.

The eldest, when we heard them in 1770, was 70, and the youngest 60. The *idem velle et idem nolle* were as perfectly in tune as their instruments: so that they had always lived together in the utmost harmony, carrying their similarity of taste to their very dress, which was the same in every particular, even to buckles and buttons. They had lived so long, and in such a cordial manner together, that it was thought, whenever one of them died, the other would not long survive him; which was exactly the case, both dying in 1780, within a few months of each other.

The composition of these exquisite performers generally consisted of select and detached passages, yet so highly polished, that like apophthegms or maxims in literature, each was not a fragment but a whole; their pieces being in a peculiar manner contrived to display the genius of their several instruments and powers of performance. The eldest played the hautbois, and the youngest the bassoon; but it is difficult to describe their peculiarities of expression. Their composition, when printed, gave but an imperfect idea of their sweetness and delicacy: there were such a perfect acquiescence and agreement together, that many of the passages seemed heart-felt sighs breathed through the same reed. No brilliancy of execution was aimed at; all were notes of meaning. The imitations were exact; the melody equally divided between the two instruments; each *forte*, *piano*, *crescendo*, *diminuendo*, and *appogiatura* (see all these terms in their places), were observed with a minute exactness that could be attained only by a long residence and study together. The eldest brother had lost his under front-teeth, and complained of age; and it was natural to suppose that the performance of each had been better; however, to me (says Dr. Burney), who heard them now, for the first time, it was delightful! If there was any thing to lament in so exquisite a performance, it arose from the *equal perfection of the two parts*; which distracted the attention, except when in dialogue, so much as to render it impossible to listen to both, when both had dissimilar melodies equally pleasing.

They were born at Parma, and had been upwards of 40 years in the service of his Sardinian majesty, without ever quitting Italy, (except one short excursion to Paris, in 1755,) or even Turin, but for that journey, and another to visit the place of their nativity. They were men of a sober, regular, and moral character; in easy circumstances; had a town and country house, and in the former many good pictures by the first masters.

The Bezozzi family has furnished many admirable musicians to Italy, and other parts of Europe. Gætano Bezozzi, a celebrated performer on the hautbois in the king of France's service, was born at Parma in 1727, entered into the service of the king of Naples in 1736, and into that of the king of France in 1765. We heard him perform a concerto at the *concert spiritual* at Paris in 1770, with great pleasure; and thought him superior to all whom we had then heard on the hautbois, except Fischer. His father, Joseph Bezozzi, had taught the celebrated brothers at Turin, Alexander and Jerom, his brothers, to play on the hautbois and bassoon. "M. Bezozzi of Paris," says Laborde, "in 1780, had during 25 years merited and enjoyed the highest reputation, as well as the esteem of all who knew him. His son

was

was then lately received into the king's band, and his brother, Anthony Bezozzi, attached to the court of the king of Poland, had alſo a ſon in the ſervice of that of Dreſden, where we heard him perform in 1772, and found him a truly great performer. His *meſſa di voce*, or ſwell, was prodigious; indeed he continued to augment the force of a tone ſo much, and ſo long, that it was hardly poſſible not to fear for his lungs. His taſte and ear were exceedingly delicate and refined; and he ſeemed to poſſeſs a happy and peculiar faculty of tempering a continued tone to different baſes, according to their ſeveral relations: upon the whole, his performance was ſo capital, that a hearer muſt be extremely fatidious not to receive from it a great degree of pleaſure.

BEZZAMA, Marcella, in *Geography*, a town of Italy, in the kingdom of Naples, and country of Otranto, 10 miles N.E. of Tarento.

BHAGNAGUR, a name formerly given to Hydrabad, which ſee.

BHAKOR. See Behker.

BHARATA, a name given in the Sanſkreet language to Hindoodan.

BHATGAN, a city of Aſia, in the kingdom of Nepal; the capital of an independent kingdom. It contains about 12,000 families, extends towards the eaſt to the diſtance of five or ſix days' journey, and borders upon another nation, alſo independent, called "Ciratas," who profeſs no religion. See Nepal.

BHAVANI, the name of an ancient feſtival, annually celebrated on the firſt of May by the Gopas, and all other Hindoos who keep horned cattle for uſe or profit. On this feaſt, they viſit gardens, erect a pole in the fields, and adorn it with pendants and garlands. Similar rites are performed by the ſame claſs of people in England, where it is known to be a relic of ancient ſuperſtition in that country. Hence it ſhould ſeem, ſays colonel Pearſe, that the religion of the Eaſt, and the old religion of Britain, had a ſtrong affinity. Aſiatic Reſ. vol. ii. p. 333.

BHEERAH, a place in Hindooſtan, on the eaſt ſide of the Behut river, where is a paſs over it, a little to the N. of W. from Lahore, about 11 minutes north of its parallel, and diſtant from it 85½ geographical miles. N. lat. 32° 5'. E. long. 72° 12'.

BI, or Bia, a river of Ruſſia, which, by uniting with the Katunia, forms the river Oby.

BIA, in *Conchology*, a name given by the Siameſe to a ſort of little white ſhell, brought in vaſt numbers from the Maldive iſlands, and uſed throughout moſt part of the Eaſt Indies for ſmall money. Nine of theſe are equal to the French denier; they are called coris or cowries, and belong to the Cypræa genus of Linnæus.

BIABANA, in *Ancient Geography*, a town placed by Ptolemy in the interior part of Arabia Felix.

BIACULEATUS, in *Ichthyology*, a ſpecies of Balistes, having two ventral ſpines. Bloch. Gmel. &c. This is *piſcis cornutus* of Willughby. It inhabits India, and is of an elongated form, white, cinereous above, and rough to the touch, being covered with very ſhort, hirſute, or briſtly hairs. It is a native of the Eaſt Indies, and, from the ſtructure of the mouth, is a voracious kind, feeding probably on marine worms and crabs. The Dutch call it *Heyen-viſch*; and the French, *Baliſte a deux piquans*, in allution to the two ventral ſpines, which conſtitute the ſpecific character of the fiſh.

BIÆUM, from βια, *oppoſition*, in *Rhetoric*, denotes a kind of counter-argument, whereby ſomething alleged for the adverſary is retorted againſt him, and made to conclude a different way; for inſtance, "Occidiſti, quia adſtitiſti interfecto.—Immo quia adſtiti interfecto non occidi; nam ſi id effet, in fugam me conjeciſſem." "You killed the perſon, becauſe you were found ſtanding by his body." *(Biæum.)* "Rather I did not kill him, becauſe I was found ſtanding by his body; ſince, in the other caſe, I ſhould have fled away."

Biæum, in the *Grecian Laws*, was an action brought againſt thoſe who raviſhed women, or uſed violence to any man's perſon. Potter, Archæol. lib. i. c. 24.

Biæum alſo denotes a kind of ſaline or ſea-wine, uſed by the ancient Greeks in various diſorders. It was made of grapes gathered a little before ripe, and dried in the ſun; then preſſed, the juice put up in caſks, and mixed with a large proportion of ſea-water; though Dioſcorides ſeems to deſcribe it as made of grapes ſteeped in ſea-water, and then preſſed. Gorr. Def. Med. p. 75.

BIAFAR, or Biafra, in *Geography*, a populous and powerful kingdom of Africa, ſituate weſt of Medra and eaſt and ſouth-eaſt of Benin, from which it is ſeparated by a chain of mountains; and extending beyond the fourth degree of north latitude, to the coaſt of the gulf of Guiena. It has a capital of the ſame name; and the bay on its coaſt is called the bight of Biafra. The natives of this country, the interior of which is little known, are idolaters, and much addicted to magic. They are ſaid to be zealous in their worſhip, and to ſacrifice their children to the devil. Biafra is alſo a ſmall diſtrict of Africa, extending along the ſea-coaſt, S.S.E. of the river Gambia, over-againſt the iſlands of Biſſagos.

BIAFORA, in the *Cuſtoms of the Middle Age*, a form of cry, or alarm to arms; on the hearing whereof, the inhabitants of towns or villages were to iſſue forth, and attend their prince. The word ſeems originally from Gaſcony; and the Italians even now, on a ſudden inſurrection of the people, commonly cry, *Via fora*, by an uſual change of the letter B into V.

BIAGIO, St., in *Geography*, a town of Italy, in the kingdom of Naples, and province of Calabria Ultra, 3½ miles W.S.W. of Nicaſtro.—Alſo, a town in the ſame kingdom, in the county of Moliſe, 8 miles N.E. of Moliſe.

BIAJOS, the name by which the inhabitants of the iſland of Borneo are diſtinguiſhed. They are ſaid to offer ſacrifices of ſweet-ſcented wood to one ſupreme beneficent deity, and theſe ſentiments of piety are accompanied by laudable morals. See Banjermassing and Borneo.

BIALA, a part of Pruſſian Sileſia, in the circle of Zulz. —Alſo, a ſmall town in the duchy of Lithuania, belonging to Pruſſia, ſeated on the government of Johanneſburg, which obtained its privileges in 1722.—Alſo, a town and river of Poland, which runs into the Viſtula, S.W. of Cracow. N. lat. 49° 52'. E. long. 19° 20'.

BIALACERKIEW, a ſmall town of Poland, in the Ukrain, ſeated on the Roſs, a river of the palatinate of Kiov, which diſcharges itſelf into the Dnieper; diſtant 60 miles S.S.W. from Kiov. Here the Tartars were entirely defeated in 1626.

BIALAGRODKO, a ſmall town of Poland, in the palatinate of Kiov, ſeated on the Iſpian, 14 miles S.W. of Kiov.

BIALLA, or Biala, a town of Poland, in the palatinate of Brzeſk or Birſetſk, 16 miles S.W. of Brzeſk or Birſetſk. N. lat. 52° 10'. E. long. 23° 25'.

BIALLISTOCK, or Bialystok, a neat and well-built town of Poland, in the palatinate of Podalachia, north of Bielſk, in N. lat. 53° 5'. E. long. 23° 32'. The ſtreets are broad, and the houſes, which are in general plaſtered, ſtand detached at uniform diſtances. The ſuperior neatneſs

of this town is owing to the illuſtrious family of Braniſki, whoſe palace adjoins the town, and who have contributed to ornament their place of reſidence. This palace is a large building, in the Italian taſte, and, on account of its magnificence, generally called the Verſailles of Poland. It was formerly only a royal hunting ſeat, but given by John Caſimir, together with Balliſtock, and other eſtates, to Czarnieſki, a general highly diſtinguiſhed by his victories over the Swedes, when Poland was nearly cruſhed by her enemies. Czarnieſki left one daughter, who married Braniſki, the father of the late great general, and conveyed the eſtate into that family.

BIALOBOKY, a town of Poland, in the palatinate of Lemberg, 48 miles S.W. of Lemberg.

BIANA, a town of Hindooſtan, 20 leagues from Agra, which was formerly a large city, and included Agra among its dependencies. The town is ſtill conſiderable, and contains many large ſtone houſes. It was formerly the reſidence of a powerful rajah; but his principal city and fort were ſeated on the top of an adjoining hill, and the preſent town was only a ſuburb. The whole ridge of the hill is covered with the remains of large buildings, among which, the moſt remarkable is a fort, called "Bijey-Munder," containing a lofty pillar of ſtone, called "Bheemlat," or the Tealer or oilman's lat or ſtaff. This pillar is conſpicuous at a great diſtance. The town and diſtrict now belong to "Ramjaht Sing," the rajah of Bhirtpoor. This place is famous for its excellent indigo. N. lat. 26° 20′. E. long. 77°.

BIANCA, La, a town of Italy, in the kingdom of Naples, and province of Calabria Ultra, 12 miles N.E. of Bova.

Bianca, Ital. for the note in muſic, which we denominate a *minim*: and the Fr. *une blanche*. This, though now almoſt the longeſt note in uſe, three or four hundred years ago, was the ſhorteſt. See Time-Table, and Musical Characters.

BIANCHI, Francisco, called *Il Frari*, in *Biography*, an hiſtorical painter, was born at Modena, and was the diſciple of the celebrated Antonio Correggio. His colouring was delicately fine, his attitudes graceful, and his invention very grand. His works poſſeſſed an aſtoniſhing beauty, and are prized as highly as even thoſe of Correggio. He died in 1510. Pilkington.

Bianchi, Peter, a painter of the Roman ſchool, was born in Rome in 1694, and united with his talents as a painter the accompliſhments of literature. He painted hiſtorical ſubjects, portraits, rural and naval ſcenes, animals, plants, and flowers, in freſco, oil, and diſtemper. His reputation cauſed him to be employed in painting a picture in the church of St. Peter. He is ſaid to have been a ſevere judge of his own performances, and to have deſtroyed many of his works after they were finiſhed, becauſe they did not pleaſe him. He died at Rome in 1739. Encyclopedie.

Bianchi, John Baptist, born at Turin, Sept. 12th, 1681, of an ancient and reſpectable family. After being educated with the greateſt care, and under the ableſt maſters at home, he was ſent early to the univerſity, and made ſuch progreſs in his ſtudies, that at the age of 17 he was admitted doctor in medicine, and was ſoon after made phyſician to the hoſpital, a ſituation for which he was peculiarly qualified; for being fond of anatomical purſuits, he had here opportunity, from the number of ſubjects a large eſtabliſhment of that kind neceſſarily furniſhed, of diſſecting and examining the human body at every age, and labouring under every ſpecies of diſeaſe or deformity. He had the happineſs alſo of finding his talents properly eſtimated by his brethren, and his labours rewarded, as he was advanced to be public teacher of anatomy at Turin, where his ſovereign built for him, in the year 1715, a ſpacious and convenient amphitheatre. He alſo read lectures in philoſophy, in pharmacy, chemiſtry, and on the practice of medicine. Theſe honours were not however entirely without alloy, as he had the mortification to find his doctrines cenſured by Morgagni, and by Haller, and even the exiſtence of ſome parts he ſuppoſed he had diſcovered, diſputed. The principal of his works are "Hiſtoria hepatica, ſeu de hepatis ſtructura, uſibus, et morbis," 1710, 8vo. Morgagni has publiſhed ſome ſevere ſtrictures on this work, in his "Adverſaria Anatomica." It has paſſed, however, through ſeveral editions, and in 1725, was republiſhed in two vols. 4to. with figures. "Ductus lacrymales novi, eorum uſus, morbi, curationes," 4to. 1715. alſo cenſured by Morgagni. "Storia de monſtro, di due corpi," 8vo. 1749, the moſt laboured and perfect, Haller ſays, of all his works. He wrote alſo an hiſtory of the generation of man, with figures, in which he attempts to delineate the fœtus in its different ſtages, but the figures, Haller ſays, are principally factitious. Many of his diſſertations are inſerted by Mangeti in his "Theatrum Anatomicum." Haller. Bib. Anat. et Chirurg. Eloy. Dict. Hiſt.

Bianchi, John, born at Rimini, Jan. 3, 1693. After receiving a liberal education, he went to Bologna, where, in 1719, he was admitted doctor in medicine. Returning the following year to Rimini, he practiſed medicine there with ſucceſs for many years. He revived the academy of Lynxes, a philoſophical ſociety, collecting the members together at firſt at his own houſe. In gratitude for this, a medal was ſtruck, with his figure on the face, and on the reverſe, a lynx, with the motto "Linceis reſtitutis." His works are various, of which the principal are "A Treatiſe on the Cataract," 4to. 1720, in Italian. "Epiſtola anatomica, ad Joſephum Putæum," 4to. 1726. "De monſtris, et rebus monſtroſis," 4to. 1749, and in 1751, an account of an impoſtume of the right hemiſphere of the brain, occaſioning paralyſis on the oppoſite ſide of the body. Eloy. Dict. Hiſt.

BIANCHINI, Francis, a mathematician and philoſopher, was born at Verona, Dec. 13, 1662, and devoting himſelf to the church, became a doctor in theology, and diſtinguiſhed by his unfeigned piety. But his principal celebrity was acquired by his literary and ſcientific performances. In early life he contributed to the eſtabliſhment of the academy of the "Aletofoli," or the lovers of truth, and in the progreſs of his ſtudies rendered it conſiderable ſervice. His literary reputation attracted that notice to which the rank of his family alſo in ſome meaſure entitled him. Cardinal Ottoboni, afterwards pope Alexander VIII., appointed him his librarian; and he was promoted firſt to the dignity of canon in the church of Santa Maria della Rotunda, and alſo to that of St. Laurence, in Damaſo. He was alſo ſecretary to the congregation for the reform of the calendar, to which office he was nominated by pope Clement XI. The ſenate created him one of the nobility of Rome, and after his death the citizens of Verona placed his buſt in their cathedral. He died of the dropſy, March 2, 1729, with a character diſtinguiſhed for the benevolence and candour of his manners, as well as for his piety and univerſal learning. Fontenelle honoured his memory with an eloge, as one of the foreign members of the academy of ſciences at Paris. His firſt work was "An Univerſal Hiſtory," on a new plan, ſerving to give perſpicuity to the chronological diſtribution. The firſt part of this work was publiſhed in 1697, under the title of "La Iſtoria Univerſale provata con monumenti et figurata con Simboli de gli Antichi." It extends, from the creation

creation of the world, to the deſtruction of the great Aſſyrian empire, and is held in high eſtimation for induſtry of reſearch, and ingenuity of diſquiſition with regard to the genuine monuments of antiquity. The ſucceeding parts were never written. On occaſion of the reform of the calendar, Bianchini wrote two learned and ſcientific treatiſes publiſhed in 1703, and entitled "De Calendario et Cyclo Cæſaris ac de canone Paſchali Sancti Hippolyti Martyris, Diſſertationes duæ." Of his aſtronomical ſkill and labour in tracing the meridian line, in the church of the Chartreux at Rome, he publiſhed an account in a diſſertation "De nummo et gnomone Clementino." In 1727, he publiſhed "Camera ed Inſcrizioni Sepolcrati di Liberti, Servi ed Officiali della Caſa di Auguſto, &c." on occaſion of the diſcovery of a ſubterraneous ſepulchral building, in 1726, on the Appian way. His obſervations on Venus were publiſhed in 1728, under the title of "Heſperi et Phoſphori Nova Phenomena, ſive Obſervationes circa Planetam Veneris." The reſults of his obſervations on the rotation of Venus, and the poſition of its axes, though very intereſting to aſtronomers at the time of their publication, have not, however, been confirmed by thoſe of a later date, made by Herſchel and Schroeter, with inſtruments of much greater power than any which were known in his time, and inſerted in the Philoſophical Tranſactions. The cauſe of this difference has not yet been aſcertained, and deſerves inveſtigation. (See Venus.) Bianchini was employed for eight years in preparatory meaſures for tracing a meridian line through the whole extent of Italy, but his death prevented the commencement of this enterpriſe. His edition of "Anaſtaſius's Lives of the Popes," in 4 vols. folio, with notes, diſſertations, prefaces, &c. diſplays much genius and erudition; but it is ſaid to abound with typographical errors. He left an unedited diſſertation in Latin, on the three kinds of muſical inſtruments of the ancients, which was publiſhed at Rome 1742, in 4to., under the following title: "Franciſci Bianchini Veronenſis utriuſque ſignaturæ referendarii, & prelati domeſtici, de tribus generibus inſtrumentorum muſicæ veterum organicæ diſſertatio." In dividing ancient muſical inſtruments into three claſſes, namely, wind inſtruments, ſtringed inſtruments, and inſtruments of percuſſion, the firſt claſs includes flutes, trumpets, horns, the ſyrinx, and hydraulicon; the ſecond, the monochord, the lyra trichordis, tetrachordum, the ſeven-ſtringed lyre, the chelys, the cithara, pſaltery, harp, &c.; the third claſs compriſes the tympanum, cymbalum, crotalum, ſiſtrum, and the tintinnabulum. Of all theſe, the author has given deſcriptions and repreſentations well engraven on plates. Fontenelle Eloge des Academiciens. Nouv. Dict. Hiſt.

BIANDRATE, in *Geography*, a town of Piedmont, in the Novareſe, 6 miles N.W of Novara.

BIANDRONA, a town of Italy, in the duchy of Milan, 15 miles W.S.W. of Como.

BIANOR, in *Entomology*, a ſpecies of Papilio, nearly allied to *P. Paris*, and a native alſo of the Eaſt Indies. The wings are above and beneath of the ſame black colour, with five rufous lunules on the poſterior pair. Fabricius, &c. It may be doubted whether this is a diſtinct ſpecies from Paris; perhaps only a ſexual difference.

BIAR, a ſmall town of Valencia, in Spain, ſeated on a river which runs into the Elda, on the confines of New Caſtile. It is chiefly remarkable for its honey, which is diſtinguiſhed by its whiteneſs and ſolidity, unaffected by any change of weather; diſtant two leagues eaſt of Villena.

BIARCHUS, formed from βιος, *annona, victuals*, and αρχη, *chief*, an officer in the court of the emperors of Conſtantinople, intruſted with the care and inſpection of the proviſions of the ſoldiery. The biarchus was the ſame with what the Latins call *præfectus annonæ*. His function was called *biarchia*; by the Latins *præfectura rei cibariæ*. He belonged to the *ſcholia agentium in rebus*. See Agentes.

BIARMIA, in *Geography*, a name given by the Scandinavian navigators, in the middle ages, to the whole country between the White ſea and the Ural. See Permia.

BIARUM, in *Botany*, a name by which the people of Egypt at this time call the root of the *niluſar*, or *faba Ægyptia*, growing on the Nile.

BIAS, or Biass, in a general ſenſe, denotes the tendency or propenſity of a thing towards one ſide more than the other; particularly the deviation of a body, or a plane, from its rectilinear courſe, or its level. See Inclination. It ſignifies alſo the inclination of a perſon's mind to one thing more than to another. The word is French, *biais*, which ſignifies the ſame.

Bias *of a bowl*, is a piece of lead put into one ſide, to load and make it incline towards that ſide.

Bias, in *Biography*, one of the ſeven wiſe men of Greece, was a native of Priene, in Ionia, and flouriſhed in the reign of Alyattes II. king of Lydia, about 608, according to ſome, but according to Blair's tables, about 565 years before Chriſt. He was eminently diſtinguiſhed not only by his wiſdom, but by his generoſity and public ſpirit, and for theſe qualities held in the higheſt veneration by his countrymen. Alyattes was obliged by a ſtratagem of his contrivance to raiſe the ſiege of his native town, when it was reduced to the utmoſt diſtreſs by famine. He firſt ſent two fattened mules into the enemy's camp; and the king, obſerving with aſtoniſhment their good condition, ſent deputies into the city under a pretence of offering terms of peace, but with a real intention of obſerving the ſtate of the town and of the people. Bias, ſuſpecting their deſign, ordered the granaries to be filled with large heaps of ſand, and theſe heaps to be covered with corn; upon which, when the deputies returned, and reported the plenty of proviſion with which the city was furniſhed, the king no longer demurred, but concluded a treaty, and raiſed the ſiege. As an inſtance of his generoſity, it is related of him, that when ſeveral young female captives were brought from Meſſene to Priene, he redeemed them, educated them as his own daughters, and then reſtored them with a dowry to their parents. As an evidence of the low eſtimation in which he held the gifts of fortune, compared with the endowments of the mind, it is ſaid, that when Priene was once threatened with a ſiege, and the inhabitants were leaving it, loaded with their moſt valuable effects, Bias took no pains to preſerve any part of his property, alleging as a reaſon of his conduct to one who expreſſed his ſurpriſe at it, "I carry all my treaſures with me." The following maxims of wiſdom are aſcribed to him. "It is a proof of a weak and diſordered mind to deſire impoſſibilities." "The greateſt infelicity is not to be able to endure misfortunes patiently." "Great minds alone can ſupport a ſudden reverſe of fortune." "The moſt pleaſant ſtate is to be always gaining." "Be not unmindful of the miſeries of others." "If you are handſome, do handſome things; if deformed, ſupply the defects of nature by your virtues." "Be ſlow in undertaking, but reſolute in executing." "Praiſe not a worthleſs man for the ſake of his wealth." "Whatever good you do, or do all the good you can, and aſcribe the glory of it to the gods." "Lay in wiſdom as the ſtore for your journey from youth to old age, for it is the moſt certain poſſeſſion." "Many men are diſhoneſt; therefore love your friend with caution, for he

he may hereafter become your enemy." Bias is asserted to have written more than 2000 verses concerning Ionia. His death was no less honourable than affecting; for he expired in the arms of a grandson, while he was pleading a cause for a friend. Diog. Laert. l. i. 82. Val. Max. l. iii. c. 2. vii. 2. Aul. Gell. l. v. c. 11. Cicer. de Amicit. c. 60. Plut. Conv. vii. Aristot. Rhet. l. ii. c. 13. Stobæus Serm. 28. Brucker's Phil. by Enf. vol. i. p. 136.

Bias, in *Entomology*, a species of Papilio (*Pleb. Rur.*), that inhabits Cayenne. The wings are entire black, glossed with blue; beneath brown, with a white posterior margin. Fabricius.

BIASI, St. in *Geography*, a town of Italy, in the kingdom of Naples, and province of Principato Citra, 15 miles W. N. W. of Policastro.

BIATHANATI, βιαθανατοι, from βια, *violence*, and θανατος, *death*; the same with suicides, or those who kill themselves.

BIB, in *Ichthyology*, the English name of a fish of the Gadus tribe, called *luscus* by Linnæus.

BIBAN, in *Geography*, a town of Egypt, in Bahira, the residence of a kiaschef. Once a week, on Monday, a fair for camels and other cattle is held in the fields adjoining to this place.

BIBBONA, a town of Italy, in the duchy of Tuscany, 50 miles north of Arezzo.

BIBBS, Bibs, or Brackets, in *Naval Architecture*, are made of elm plank, and bolted to the hounds of masts, as supporters to the trestle trees. They are from three to five inches thick, and nine elevenths of the hounds in length, and in breadth six fifteenths their length. The after edge is first lined straight, and the upper part square from that, and the fore part tapered by a moulding to four or six inches of breadth at the lower ends. The after edge is fayed on the cheeks, and the upper part against the under side of the trestle trees on the fore side of the mast: viz. In the middle of the after edge, set up one inch and a half, and line straight from that to nothing at the lower end, which makes a butt in the middle; then place the bibbs on the mast, their thickness within the sides of the cheeks, and their upper parts to the outside of the trestle trees; then let one inch and a half be raced by the lower edge of the bibbs upon the cheeks, and the wood taken out to that depth, and the thickness of the bibbs, that they may bed firm therein; they are then bolted edgeways through the cheeks with four bolts driven from the fore side and clenched on a ring on the aft-side. The bolts are to be in diameter from one inch to seven eighths, or three quarters in small ships' masts, and only three in number. The lower end of the bibb is rounded off to the surface of the cheek, and the edges chamfered.

BIBEN, in *Geography*, a town of Persia, in the Irak Agemi, 140 miles east of Ispahan.

Biben, otherwise called *Pitschem*, and in Latin *Pedena*, or *Petina*, a town of Carniola, seated in a very fertile spot, on a high mountain; and the see of a bishop, to whose jurisdiction belong two towns and eleven villages, in which are fourteen parishes, suffragan to the prelate of Gorz.

BIBER, a town or village of Germany, in the circle of the lower Rhine, the electorate of Mentz, and prefecturate of Steinheim, 5 miles E. S. E. of Francfort on the Main. This is one of eleven villages which are possessed in common of a wood named the "Biber Mark." At Biber, all things relating to it are managed by the sheriffs of the Mark: and before the village, under a great lime-tree, lies the sheriff's bench, where the Mark court is fenced in, and transgressors are openly cited and punished.

Biber, in *Zoology*, a name given by Ridinger, &c. to the *beaver*, *castor fiber*. Linnæus.

Biber, Henry John Francis, in *Biography*, vice-chapel-master to the archbishop of Salzburg, seems to have been the greatest performer on the violin of the 17th century. Baltzar from Lubec, about the middle of that century, had so astonished the Oxonians by his execution on the violin, that according to Ant. Wood, Dr. Wilson, the music professor, after hearing him, stooped down to examine his feet, whether they were not cloven; that is, "whether he was a devil, or not, because his performance was beyond the faculties of man." But if we may now judge of his performance by his compositions that are still extant, it was very inferior to that of *Biber*, who published in 1681, solos for a violin and base, the most difficult and the most fanciful of any music of the same period. One of the solos is written on three separate staves, as if a score for two violins and a base; but the trebles are to be played in double stops. Others are played in different tunings of fourths and fifths, as for a treble viol. A second work by this musician, intitled *fidicinum sacro profanum*, consists of twelve sonatas in four and five parts, to be played on three instruments; and a third, *harmonia artificiosa ariosa*, published at Nuremberg, consisting of pieces in seven parts, to be played on three instruments. In this last work he is styled *Dapifer*. In knowledge of the finger-board, double stops, and use of the bow, as well as composition, he seems to have surpassed all preceding violinists.

BIBERACH, in *Geography*, an imperial city of Germany, in the circle of Swabia, situate in a valley, watered by the Riess, near the Danube. The magistrates and people are partly protestants and partly catholics; and the church, as well as the hospital, are common to both. The treaty of Westphalia requires that it should have as many catholics as Lutherans in the senate. It is governed, as to its offices, like the city of Augsburg. It has a large manufacture of fustians. The number of houses is estimated at 900, of inhabitants at 6,600, and of burghers at 900. This city is very ancient, and was known in the year 751, under Pepin. By the plan of indemnities agreed upon by France and Russia, this imperial town was conceded to the margrave of Baden. N. lat. 48° 4′. E. long. 10° 2′.

BIBERSTEIN, a small town of Swisserland, in the canton of Bern, seated on the north-west side of the Aar. N. lat. 47° 17′. E. long. 7° 56′.—Also, a bailliwick, with a castle, in the circle of the Upper Rhine, and bishopric of Fulda, 8 miles east of Fulda.

BIBIENA, Bernardo Da, *Cardinal*, whose proper name was *Dovizi*, or *Divizio*, was born of an obscure family at Bibiena, in the Cesentine, in 1470, and entered into the service of the family of Lorenzo di Medici. He attached himself to cardinal John, afterwards pope Leo X., whom he accompanied in his exile and served with affection and fidelity. At Rome he ingratiated himself with pope Julius II., by whom he was employed in some concerns of importance, and by whom his services were approved. On the death of Julius, he artfully persuaded the cardinals, that his master, though only 36 years of age, was not likely to live long, and by this artifice obtained his election. Leo was not insensible of his obligations, and made him his first treasurer, and in 1513, cardinal. In the direction of the works of the holy house of Loretto, in which he was employed, he encouraged men of literature, and engaged the best artists, particularly Raphael. Leo also deputed him as legate to the pontifical army against the duke of Urbino, then to the emperor Maximilian, and afterwards, in 1518, to Francis I.

cis I. King of France, for the purpose of forming a crusade against the Turks. On this occasion he was received with very marked distinction at Paris, though the event of the journey proved fatal to him. It has been generally supposed, that having a view to succeed Leo in the papal see, he had obtained the promise of Francis's support; and that Leo, being apprized of his ambition, took him off by poison; or perhaps, the displeasure of the pope might so much affect him as to occasion a fit of illness, which proved mortal in November 1520.

Bibiena is distinguished in the history of literature as a polite writer, and particularly as the author of a celebrated comedy called "Calandra." This was the first comedy written in prose in the Italian language, or at least the first that obtained any considerable degree of popularity; and it is still esteemed as one of the best productions of the age, though the wit is not free from indelicacy, and many passages of it are copied from Plautus. It was represented in a very magnificent manner at Urbino, and afterwards at Rome. The actors were young men of rank, and the author is said to have taken great pains in training the courtiers to dramatic exercises, which were performed under the occasional inspection of Leo, in the chambers of the Vatican. Gen. Biog.

Bibiena, Ferdinando-Galli, a celebrated painter and architect, was born at Bologna in 1657; and losing his father when very young, was placed under the direction of Carlo Cignani, who, observing his taste for architecture, obtained for him the instruction of Paradossi, Aldrovandini, and Mauini, the best masters of that period for perspective and architecture. In consequence of the recommendation of Cignani, he was patronised by the prince of Parma, who employed him in executing a variety of decorations, and settled upon him an annual pension. For the dukes of Parma, he painted the scenes for *Hiero*, tyrant of Syracuse, in 1685; for *Thalystris* in love with Alexander, 1693; for *Demetrius tiranno*, 1694; for *Erachea*, 1700; and for *I rivali generosi*, in 1701. From Parma he went to Milan, where, in 1704, he painted the scenes for *L'Amazzone Corsara*, and thence went to Vienna, and was appointed painter and architect to the emperor Charles VI., by whom he was highly honoured and rewarded. He was the inventor of those wonderful and magnificent scenes which still decorate many theatres in Italy; and published a book of instructions for embellishing theatres in general. He also built several palaces, was likewise an excellent machinist, and the sole inventor and director of the solemn festival machinery exhibited for the birth of the archduke of Austria, celebrated at *La Favorita*, near Vienna.

He had a brother, Francis, of equal genius and fame, and two sons worthy of such a father. It was Ferdinando Bibiena Galli, who, quitting mythology and fantastic forms, gave true representations of nature; rapidity of change; intelligent disposition of lights, and above all, that great help to illusion, the leaving something to the spectator's imagination. At length he lost his sight by cataracts in his eyes, and obtained leave to return to Italy, where he composed two volumes upon architecture for the instruction of young persons. He had several children, whom he educated to his own art, and a considerable number of scholars. Bibiena died at Bologna, as some say, in 1741, and according to others, in 1743. His easel pictures exhibit a noble and elegant ordonnance, and an uncommonly beautiful tone of colour. His perspectives have an astonishing effect by judicious masses of light and shadow; and the vestiges of magnificent buildings, which he happily introduces in his compositions, add a richness and grandeur to all his performances.

Bibiena, in *Geography*, a market-town of Italy, in the duchy of Tuscany, and district of Casentino.

BIBIG, a town of Egypt, two miles south of Feium.

BIBIO, in *Entomology*, one of the Fabrician genera of Antliata, and which in the Linnæan system forms a section of the Musca genus. Fabricius defines the generical character of *Bibio* from the sucker, feelers, and antennæ. The sucker consists of three bristles and a sheath of a single valve; feelers very short; antennæ connected at the base, and pointed at the tip. Ent. Syst. See Musca.

BIBITORY Muscle. See Adductor *Oculi*.

BIBLE, a book by way of eminence so called, containing the Scriptures, i. e. the writings of the Old and New Testament; or the whole collection of those which are received among Christians as of divine authority.

The word Bible comes from the Greek βιβλία, or βιβλίον, used to denote any book; but, by way of eminence, applied to the book of Scripture, which is "the book," or "book of books," as being superior in excellence to all other books. βιβλία again comes from βίβλος, the Egyptian reed, from which the ancient paper was procured. See Biblus.

The word Bible seems to be used in the sense now specified by Chrysostom (In Col. II. 9. tom. xi. p. 391.): "I therefore exhort all of you to procure to yourselves Bibles." (βιβλία). If you have nothing else, take care to have the New Testament, particularly the Acts of the Apostles, and the Gospels for your constant instructors. And Jerom says (In Is. c. 29. tom. iii. p. 246.), "that the Scriptures being all written by one spirit, are one book." Augustine also informs us (Enarr. in Ps. il. n. 2. tom. iv.), "that some called all the canonical Scriptures one book, on account of their wonderful harmony and unity of design throughout." It is not improbable, that this mode of speaking gradually introduced the general use of the word "Bible" for the whole collection of the Scriptures, or the books of the Old and New Testament.

The Bible is known by various other appellations, as the "Sacred Books," the "Inspired Writings," "Holy Writ," "Sacred Text," &c. By the Jews the Bible, i. e. the Old Testament, is called "Mikra," that is, lecture, or reading; by the Christians the Bible, comprehending the Old and New Testament, is usually denominated "Scripture," q. d. writing; sometimes also the "Book of God," the "Canon," "Rule of Faith," &c. These, and similar appellations, are derived from the opinion that has been entertained, in successive ages, of the divine original and authority of the Bible, and of its importance and utility as a rule of faith and directory of conduct. As it contains an authentic and connected history of the divine dispensations with regard to mankind; as it alays claim to divine inspiration; as its chief subject is religion; and as the doctrines it teaches, and the duties it inculcates, pertain to the conduct of men, as rational, moral, and accountable beings, and conduce by their natural influence, as well as by a divine constitution and promise, to their present and future happiness; the Bible deserves to be held in high estimation, and amply justifies the sentiments of veneration with which it has been regarded, and the peculiar and honourable appellations by which it has been denominated. See the sequel of this article.

The list of the books contained in the Bible, is called the canon of Scripture. See Canon. Those books that are contained in the catalogue to which the name of canon has been appropriated, are called canonical, by way of contradistinction from others called deutero-canonical, apocryphal, pseudo-apocryphal, &c., which either are not acknowledged as divine books, or are rejected as heretical and spurious. See Apocryphal.

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The first canon or catalogue of the sacred books was made by the Jews; but the original author of it is not satisfactorily ascertained. It is certain, however that the five books of Moses, called the Pentateuch, were collected into one body within a short time after his death; since Deuteronomy, which is, as it were, the abridgment and recapitulation of the other four, was laid in the tabernacle near the ark, according to the order which he gave to the Levites. (ch. xxxi. v. 24.) Hence it appears that the first canon of the sacred writings consisted only of the five books of Moses; for a further account of which, see PENTATEUCH. It does not appear that any other books were added to these, till the division of the ten tribes, as the Samaritans acknowledged no others. However, after the time of Moses, several prophets, and other writers divinely inspired, composed either the history of their own times, or prophetical books and divine writings, or psalms appropriated to the praise of God. But these books do not seem to have been collected into one body, or comprised under one and the same canon, before the Babylonish captivity. This was not done till after their return from the captivity, about which time the Jews had a certain number of books digested into a canon, which comprehended none of those books that were written since the time of Nehemiah. The book of Ecclesiasticus affords sufficient evidence, that the canon of the sacred books was completed when that tract was composed; for that author, in chap. xlix. having mentioned among the famous men and sacred writers, Isaiah, Jeremiah, Ezekiel, adds the twelve minor prophets, who follow those three in the Jewish canon; and from this circumstance we may infer, that the prophecies of these twelve were already collected and digested into one body. It is farther evident, that in the time of our Saviour the canon of the holy Scriptures was drawn up, since he cites the Law of Moses, the Prophets, and the Psalms, which are the three kinds of books of which that canon is composed, and which he often styles "the Scripture," or "the Holy Scripture." Matt. xxi. 42. xxii. 29. xxvi. 54. John, v. 39. This shews that they were distinguished from others, and formed a separate body. The person who compiled this canon is generally allowed to be Ezra. According to the invariable tradition of Jews and Christians, the honour is ascribed to him of having collected together and perfected a complete edition of the Holy Scriptures. The original of the Pentateuch had been carefully preserved in the side of the ark, and had been probably introduced with the ark into the temple at Jerusalem. After having been concealed in the dangerous days of the idolatrous kings of Judah, and particularly in the impious reigns of Manasseh and Amon, it was found in the days of Josiah, the succeeding prince, by Hilkiah the priest, in the temple. Prideaux says, that during the preceding reigns, the book of the Law was so destroyed and lost, that, besides this copy of it, there was then no other to be obtained. To this purpose he adds, that the surprise manifested by Hilkiah, on the discovery of it, and the grief expressed by Josiah when he heard it read, plainly shew that neither of them had seen it before. Upon this, the pious king ordered copies to be written out from this original, and to be dispersed among the people. 2 Kings, xxii. 8—13. 2 Chron. xxxiv. On the other hand, Dr. Kennicott supposes, that long before this time, there were several copies of the Law in Israel, during the separation of the ten tribes, and that there were some copies of it likewise among the tribes of Judah and Benjamin, particularly in the hands of the prophets, priests, and Levites; and that by the instruction and authority of these MSS., the various services in the temple were regulated, during the reigns of the good kings of Judah. He adds, that the surprise expressed by Josiah and the people, at his reading the copy found by Hilkiah, may be accounted for by adverting to the history of the preceding reigns, and by recollecting what a very idolatrous king Manasseh had been for 55 years, and that he wanted neither power nor inclination to destroy the copies of the Law, if they had not been secreted by the servants of God. The Law, after being so long concealed, would be unknown almost to all the Jews; and thus the solemn reading of it by Josiah would awaken his own and the people's earnest attention; more especially, as the copy produced was probably the original written by Moses. From this time copies of the Law were extensively multiplied among the people; and though within a few years, the autograph, or original copy of the Law, was burnt with the city and temple by the Babylonians, yet many copies of the Law and the Prophets, and of all the other sacred writings, were circulated in the hands of private persons, who carried them with them into their captivity. It is certain that Daniel had a copy of the Holy Scriptures with him at Babylon; for he quotes the Law, and mentions the prophecies of Jeremiah. Dan. ix. 11. 13. ix. 2. It appears also, from the sixth chapter of Ezra, and from the ninth chapter of Nehemiah, that copies of the Law were dispersed among the people. It is unnecessary, therefore, to suppose, with some of the ancient fathers, such as Tertullian, Clemens Alexandrinus, Basil, &c. that Ezra restored the Scriptures by a divine revelation, after they had been lost and destroyed in the Babylonish captivity. For this opinion they had no other authority than the fabulous relation which occurs in the 14th chapter of the second apocryphal book of Esdras; a book too absurd for the Romanists themselves to admit into their canon. The whole which Ezra did may be comprized in the following particulars. He collected as many copies of the sacred writings as he could find, and compared them together, and out of them all, formed one complete copy, adjusted the various readings, corrected the errors of transcribers, and as some say, annexed the "Keri chetibs," which are found in the margins of the ancient MSS. He likewise made additions in several parts of the different books which appeared to be necessary for the illustration, correction, and completion of them. To this class of additions, we may refer the last chapter of Deuteronomy, which, as it gives an account of the death and burial of Moses, and of the succession of Joshua after him, could not have been written by Moses himself. Under the same head have also been included many other interpolations in the Bible, which create difficulties that can never be solved without allowing them; as in Gen. xii. 6. xxii. 14. xxxvi. 3. Exod. xvi. 35. Deut. ii. 12. iii. 11. 14. Prov. xxv. 1. The interpolations in these passages are ascribed by Prideaux to Ezra; and others which were afterwards added he attributes to Simon the Just. Ezra also changed the old names of several places that were become obsolete, putting instead of them the new names by which they were at that time called; instances of which occur in Gen. xiv. 4, where Dan is substituted for Laish, and in several places in Genesis, and also in Numbers, where Hebron is put for Kirjath Arba, &c. He likewise wrote out the whole in the Chaldee character, changing for it the old Hebrew character, which hath since that time been retained only by the Samaritans, and among whom it is preserved even to this day. In the church of Dominic, in Bononia, there is said to be a copy of the Hebrew Scriptures, preserved with great care, which they pretend to be the original copy written by Ezra himself, and for which great sums have been occasionally borrowed by the Bononians upon the pledge of it, and which have again been paid for its redemption. This copy is written in a

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very fair character upon a sort of leather, and made up in a roll, according to the ancient manner; but as it has the vowel points annexed, and the writing is fresh and fair, without any visible decay, its antiquity is very justly denied, and its novelty is unquestionable. Bishop Pocock, in his Travels, vol. i. p. 28. mentions a MS. Bible, preserved at Cairo, in Egypt, which is said to be written by Ezra.

Dupin says, that Nehemiah had a great hand in compiling this canon; for proof of which he refers to the letter of the Jews of Jerusalem written to the Jews of Egypt, mentioned in the beginning of the second book of Maccabees, in which, it is said, that Nehemiah had collected the books of the Kings, of the Prophets, and of David. It is said that this canon was then approved by the grand sanhedrim, the great synagogue or council of seventy, and published by its authority. It is, however, says Dupin, more apparent that about that time the number of the sacred books was fixed among the Jews by a canon, which the whole Jewish nation received and followed; so that they looked no longer upon such books as sacred and divinely inspired, which were not contained in this canon. The canon of the whole Hebrew bible seems, says Kennicott, to have been closed by Malachi, the latest of the Jewish prophets; about 50 years after Ezra had collected together all the sacred books which had been composed before and during his time. Prideaux supposes the canon was closed by Simon the Just, about 150 years after Malachi. But, as his opinion is founded merely on a few proper names at the end of two genealogies (1 Chron. iii. 19. and Neh. xii. 22.), which few names might very easily be added by a transcriber afterwards; it is more probable, as Kennicott thinks, that the canon was finished by the last of the prophets, about 400 years before Christ. The books of the Old Testament having been settled by Ezra, Nehemiah, Haggai, Zephaniah, and Malachi, were probably left perfect; completely repaired after the injuries of time during the captivity; and corrected from such errors as might have crept in from want of care in the transcribers. But the Hebrew text, thus left to posterity, does not seem to have continued long in the same condition. For the celebrated text, relative to mount Gerizim, was without doubt altered soon after the temple upon Gerizim was built. And as that corruption has been proved upon the Jews, the Jews themselves corrupted their Pentateuch, in this instance, probably between the years 400 and 300 before Christ. See PENTATEUCH.

It is an enquiry of considerable importance, in its relation to the subject of this article, what books were contained in the canon of the Jews. In the arrangement of Ezra these books were divided into three parts; 1st. The Law; 2dly. The Prophets; and 3dly. The Cetubim, or Hagiographa, *i. e.* the holy writings; which division our Saviour himself has taken notice of (Luke xxiv. 44.); meaning by the Psalms the whole third part, called the Hagiographa. In conformity to this division, Josephus (Contra Apion. i. 8. tom. ii. p. 441.) distributes the canonical books of the Jews into three classes. The first contains the five books of Moses; the second, thirteen historical and prophetical books, written from the time of the death of Moses to Artaxerxes; and the third, four books of hymns and of morality; the whole number amounting to twenty-two. The first class comprehends Genesis, Exodus, Leviticus, Numbers, and Deuteronomy; the second includes Joshua, Judges, Ruth, Samuel, Kings, Chronicles, Ezra with Nehemiah, Esther, Isaiah, Jeremiah with Lamentations, Ezekiel, Daniel, and the 12 minor prophets; and the third class contains Job, the Psalms, Proverbs, and Ecclesiastes. It appears that the Song of Solomon had no place in the list of the sacred writings drawn up by Josephus. Others, however, have joined Ruth with Judges, referred Job to the second class, and introduced the Song of Solomon into the third class. Origen, Athanasius, Hilary, Gregory Nazianzen, Epiphanius, and Jerom, speaking of the books that are allowed by the Jews as sacred and canonical, agree in saying, that they are the same in number with the letters in the Hebrew alphabet, *i. e.* twenty-two, and reckon particularly those books which we have already mentioned; with respect to which they all concur, except in relation to the book of Esther. All of them place the book of Job and the Lamentations among the books contained in the canon of the Jews; but Athanasius and Gregory Nazianzen do not reckon the book of Esther among them, and distinguish Ruth from the book of Judges; whereas Origen, Hilary, Epiphanius, and Jerom, make only one volume of Ruth and Judges, and introduce the book of Esther into the number of the twenty-two books reckoned by the Jews as canonical. They who distinguished Ruth from the book of Judges, and the Lamentations from the prophecy of Jeremiah, reckoned up twenty-four of them. These books are disposed of in the following order: *viz.* 1st. The Law, containing Genesis, Exodus, Leviticus, Numbers, Deuteronomy; 2dly. The writings of the prophets, divided into the former prophets and the latter prophets; those of the former being Joshua, Judges, Samuel, Kings, and the latter Isaiah, Jeremiah, Ezekiel, and the twelve minor prophets; 3dly. The Hagiographa, which are the Psalms, the Proverbs, Job, the Song of Solomon, or Song of Songs, or Canticles, Ruth, the Lamentations, Ecclesiastes, Esther, Daniel, Ezra, and the Chronicles. Under the name of Ezra is comprehended Nehemiah. However, this order hath not always been observed among the Jews, neither is it so now in all places; for in this respect there has been a great variety, not only among the Jews, but also among the Christians, Greeks as well as Latins. All these books were not received into the canon of the Holy Scriptures in the time of Ezra, for Malachi lived after him, and mention is made in Nehemiah of Jaddúa as high priest, and of Darius Codomannus as king of Persia, who lived at least 100 years after his time; and in the third chapter of the first book of Chronicles, the genealogy of the sons of Zerubbabel is extended to as many generations as will bring it to the time of Alexander the Great, so that this book could not have been inserted in the canon till after his time. Accordingly, Prideaux supposes, that the two books of Chronicles, Ezra, Nehemiah, and Esther, as well as Malachi, were added in the time of Simon the Just, when he conceives the canon of the holy Scriptures was completed. (See above).

The five books of the Law are divided into 54 sections, which division is attributed to Ezra, and was intended for the use of their synagogues, and for the better instruction of the people in the law of God. For every sabbath one of these sections was read in their synagogues. They ended the last section with the last words of Deuteronomy on the sabbath of the feast of the tabernacles, and then begun anew with the first section from the beginning of Genesis the next sabbath after, and so went round in this circle every year. The number of these sections was 54, because in their intercalated years (a month being then added), there were 54 sabbaths. On other years they reduced them to the number of the sabbaths which were in those years, by joining two short ones several times into one. For they held themselves obliged to have the whole law thus read over in their synagogues every year. Till the time of the persecution of Antiochus Epiphanes, they read only the Law; but being then prohibited from reading it any more, they substituted in the room of the 54 sections of the Law, 54 sections out of the

the Prophets, the reading of which they ever after continued. Thus, when the reading of the Law was restored by the Maccabees, the section which was read every sabbath out of the Law served for their first lesson, and the section out of the Prophets for their second lesson; and this practice was continued in the time of the apostles. Acts, xiii. 15. xiii. 27. These sections were divided into verses, called by the Jews "Pesukim," and they are marked out in the Hebrew Bible by two great points at the end of them, called from hence "Soph-Pasuk," *i. e.* the end of the verse. This division, if not made by Ezra, is very ancient; for when the Chaldee came into use in the room of the Hebrew language, after the return of the Jews from their captivity in Babylon, the Law was read to the people first in the Hebrew language, and then rendered by an interpreter into the Chaldee language; and this was done period by period. To distinguish these periods was an object of importance; and hence arose the division into verses, which was first applied to the Law, and afterwards to the Prophets and Hagiographa. The manner by which these divisions, or verses, are now distinguished is by the "Soph-Pasuk;" but it is not certain that this was the ancient method. Prideaux apprehends, that the Pesukim, or verses of the Hebrew Bibles, were anciently distinguished in the same manner as the "Stichi" afterwards were in the Greek Bibles. The manner of their writing these stichi at first was to allow a line to every stichus, and there to end the writing, where they ended the stichus, leaving the rest of the line a void break. But this mode occasioning a waste of parchment, on which their books were written, and making their bulk too heavy; in order to avoid these inconveniences, they afterwards put a point at the end of every stichus, and continued the writing without leaving any blank. In the Hebrew Bibles they adopted the same mode, and put the two points, called "Soph-Pasuk," at the place where one verse ended, and continued the writing of the next verse in the same line, without leaving any void space. The division of the holy Scriptures into chapters is of a much later date. The Psalms, indeed, appear to have been always divided as they are at present. Acts, xiii. 33. But as to the rest of the Bible, the present division into chapters was unknown to the ancients. See CHAPTER and CONCORDANCE.

Besides those books which were received into the canons of the books of the Old Testament, and those that have been deemed apocryphal, there are several others which are cited in the Old, and also in the New Testament, which seem either to have been lost, or excluded by Ezra from his canon. Of such books are the books "of the wars of the Lord," cited Numb. xxi. 4. but it does not appear that in this place any book is mentioned, "of the Covenant," of which it is said mention is made Exod. xxiv. 7. but evidently referring to the laws received by Moses from the hand of God, related in the preceding chapters; the "book of the Lord," mentioned Is. xxxiv. 16. which does not seem to be any particular book; "the book of Jasher, or the upright," cited in Joshua, x. 13. and 2 Sam. i. 18. supposed by some to be an historical book, but more probably consisting of hymns and songs; and "the books of Nathan (1 Chron. xxix. 29. 2 Chron. ix. 29.) of Gad, (1 Chron. xxix. 29.) of Shemaiah, (2 Chron. xii. 15.) of Iddo, (2 Chron ix. 29. xii. 15. xiii. 22.) of Abijah, (2 Chron. ix. 29.) and of Jehu," (2 Chron. xx. 34.), which were memoirs composed by those prophets, or rather prophecies, which contained a part of the history. The same may be said of the book of the "Journals or Chronicles" of the kings of Judah or of Israel; which are different from the Paralipomena, or Chronicles; the book of "Samuel the Seer," cited in the last chapter of the first book of Chronicles; the discourses of Hoseah, cited 2 Chron. xxxiii. 18, 19. the "Acts of Uzziah," mentioned 2 Chron. xxvi. 22. the "three thousand Proverbs, written by Solomon," (see 1 Kings, iv. 32.); "a thousand and five Songs," &c. composed by the same author, and mentioned in the same place. Jeremiah speaks of a volume of prophecies which he had dictated to Baruch, supposed by some to be the Lamentations. (See BARUCH). Besides these books that are lost, there are others, not included in the canon of the Old Testament, which are still extant; such as the "Prayer of king Manasseh, when captive at Babylon," cited 2 Chron. ch. xxxiii. "the third and fourth books of Esdras;" "the third and fourth books of the Maccabees;" "the genealogy of Job," and "a speech of Job's wife," annexed to the Greek edition of the book of Job; "a Psalm," affixed to the Greek edition of the Psalms; "the book of Enoch," not entire, cited by several of the fathers, and regarded by them as apocryphal, and referred to by Jude, v. 14. the book of the "Assumption of Moses," and his "Testament," placed by St. Athanasius among the apocryphal books; "the Assumption, Apocalypse, or Secrets of Elijah," cited by Origen; and a number of others forged by the Jews, and fathered on the Patriarchs. See NEW TESTAMENT.

It may not be improper to refer, in one view, the books of the Old and New Testaments to their proper authors. We may suppose then, without ascending to the region of conjecture, and tracing the origin of any books, or parts of books of the Bible to patriarchal times, that the Pentateuch consists of the writings of Moses, put together, perhaps, by Samuel, with a very few additions; that the books of Joshua and Judges were, in like manner, collected by him; and the book of Ruth, with the first part of the first book of Samuel, written by him; that the latter part of the first book of Samuel, and the second book, were written by the prophets who succeeded Samuel, *viz.* Nathan and Gad; that the books of Kings and Chronicles are extracts from the records of the succeeding prophets, concerning their own times, and from the public genealogical tables, made by Ezra; that the books of Ezra and Nehemiah are collections of like records, some written by Ezra and Nehemiah, and some by their predecessors; that the book of Esther was written by some eminent Jew, in or near the times of the transactions there recorded, perhaps Mordecai; the book of Job by Moses, or a Jew of an uncertain period; the Psalms by David, and other pious persons; the books of Proverbs and Canticles by Solomon; the book of Ecclesiastes by Solomon, or perhaps by a Jew of later times, speaking in his person, but not with an intention to make him pass for the author; the Prophecies by the prophets, whose names they bear; and the books of the New Testament by the persons to whom they are usually ascribed. See NEW TESTAMENT. There are many internal evidences, and in the case of the New Testament, many external evidences also, by which these books may be known to belong to the authors here named. Or, if there be any doubts, they are merely of a critical nature, and do not at all affect the genuineness of the books, or not alter, at least materially, the arguments that may be adduced in favour of their authenticity and authority. It is readily allowed, that objections have been made to the alleged authors of several of these books. Abenezra, followed by Hobbes, Pereira, Spinoza, and some others, deny the first five books to have been written by Moses. F. Simon, in particular, asserts, that the books, as we now have them, are not the originals written by the inspired penmen, but abridgments of them, made in aftertimes by a kind of college, or order of public actuaries, or scribes,

ſcribes, appointed for that purpoſe. See PENTATEUCH, and each of the books of the Bible, under its proper title. See alſo NEW TESTAMENT.

The original language of the Old Teſtament was, without doubt, the old Hebrew, at leaſt the greateſt part of it; for all the books do not appear to have been written in the ſame language. Some chapters of Ezra and Daniel, (ſee EZRA and DANIEL,) are judged to have been compoſed in Chaldee; and it has been ſuppoſed, that other chapters of this latter writer, and alſo the apocryphal books of Maccabees, Wiſdom, &c. were written in Greek; Tobit and Eccleſiaſticus, either in Greek or Syriac. As for the New Teſtament, it was written in Greek, except the Goſpel of St. Matthew, which is thought by ſome to have been compoſed in Hebrew. Some few have thought that the Goſpel of St. Mark was written in Latin, and alſo the epiſtle to the Hebrews. See the Title of each Book, and TESTAMENT.

With regard to the ſtyle of the ſeveral writers of the Old and New Teſtament, there is a very conſiderable diverſity. The ſtyle of Paul may be eaſily diſtinguiſhed by its peculiarity from that of any other writer. A diſcerning reader will not eaſily confound the ſtyle of Luke with that of either of the evangeliſts, who preceded him, Matthew or Mark; nor would he be in any danger of miſtaking the apoſtle John's diction for that of any other penman of the New Teſtament. The ſame difference of ſtyle will be diſcovered by one who is but moderately converſant with the Hebrew, in the writers of the Old Teſtament. In this we have a greater variety than in the New. Some of the books are written in proſe, and ſome in verſe; and in each the differences between one book and another are conſiderable. In the book of Job, for inſtance, the character of the ſtyle is remarkably peculiar. What can be more diſſimilar in this reſpect, though both are excellent in their kind, than the towering flights of the ſublime Iſaiah, and the plaintive ſtrains of the pathetic Jeremiah? In the ſeveral books of Scripture we can ſpecify the conciſe ſtyle and the copious, the elevated and the ſimple, the aphoriſtic and the diffuſe. This diverſity in the diction of the ſacred penmen is perfectly reconcileable with the idea of their inſpiration; and in ſpeaking on this ſubject, we ſhould duly advert to the difference between the expreſſion and the ſentiment, and avoid confounding theſe two, as if they were the ſame, whereas they are widely different. The truths implied in the ſentiments are eſſential, immutable, and have an intrinſic value; the words which compoſe the expreſſion are in their nature circumſtantial, changeable, and have no other value than what they derive from the arbitrary conventions of men. That the Holy Spirit would guide the minds of the ſacred penmen in ſuch a manner as to prevent their adopting terms unſuitable to his deſign, or which might obſtruct his purpoſe; and that in other reſpects he would accommodate himſelf to their manner and diction, is both reaſonable in itſelf, and rendered unqueſtionable by the works themſelves, which have the like characteriſtic differences of ſtyle which we find in other compoſitions. Can it be accounted more ſtrange that the Holy Spirit ſhould, by the prophet Amos, addreſs us in the ſtyle of a ſhepherd, and by Daniel, in that of a courtier, than that by the one he ſhould ſpeak to us in Hebrew, and by the other in Chaldee? It is as reaſonable to think that the Spirit of God would accommodate himſelf to the phraſeology and diction, as to the tone of voice and pronunciation of thoſe whom he was pleaſed to enlighten; for it cannot be denied, that the pronunciation of one perſon in uttering a prophecy, might be more articulate, more audible, and more affecting than that of another; and in like manner, as one ſtyle has more harmony, elegance, and perſpicuity than another. Caſtalio ſays juſtly, (Def. cont. Bezam.) "Res dictat Spiritus, verba quidem et linguam loquenti aut ſcribenti liberam permittit; i.e. the Spirit dictates the things, leaving the words or language free to the ſpeaker or writer. Jerom alſo obſerved a thouſand years before, (Comment. in Epiſt. ad Gal. cap. i.) "Nec putemus in verbis Scripturarum evangelium eſſe, ſed in ſenſu;" i.e. let us not imagine that the Goſpel conſiſts in the words of Scripture, but in the ſenſe. To the ſame purpoſe is the obſervation of the ingenious and learned biſhop Lowth, (De Sacra Poeſi, Heb. Præl. xvi.) "Hoc ita ſacris vatibus tribuimus, ut nihil derogemus Divini Spiritus afflatui; etſi ſuam interea vim propriæ cujuſque Scriptoris naturæ atque ingenio concedamus: neque enim inſtinctu divino ita concitatur vatis animus, ut protinus obruatur hominis indoles: attolluntur et eriguntur, non extinguuntur aut occultantur naturalis ingenii facultates; et quanquam Moſis, Davidis, et Iſaiæ, ſcripta ſemper ſpirant quiddam tam excelſum tamque cæleſte, ut plane videantur divinitus edita, nihilo tamen minus in iis Moſem, Davidem, Iſaiam, ſemper agnoſcimus;" i.e. we ſhall detract nothing from the dignity of that inſpiration, which proceeds from higher cauſes, while we allow to the genius of each writer his own peculiar excellence and accompliſhments. The Divine Spirit by no means takes ſuch an entire poſſeſſion of the mind of the prophet as to ſubdue or extinguiſh the character and genius of the man; the natural powers of the mind are in general elevated and refined; they are neither eradicated, nor totally obſcured; and though the writings of Moſes, of David, and of Iſaiah, always bear the marks of a divine and celeſtial impulſe, we may nevertheleſs plainly diſcover in them the particular characters of their reſpective authors. See INSPIRATION.

It muſt be allowed, that many circumſtances concur to render the ſtyle both of the New Teſtament and of the Old; of the hiſtorical books, as well as of the prophetical and argumentative, generally obſcure, and often ambiguous; although we ought not to admit the exaggerated repreſentation of father Simon, (Hiſt. Crit. des V. T. liv. iii. c. 2.) with regard to the greater part of the Hebrew words, which, he ſays, are equivocal, and of courſe their ſignification altogether uncertain. The origin of this kind of ſtatement muſt be ſought in the author's attachment to tradition, rather than to that kind of ſcepticiſm with which he is charged by Boſſuet, biſhop of Meaux, and which tended to undermine Chriſtianity itſelf. To any perſon who duly reflects, this father's repreſentation muſt appear to be unfounded, or beyond all bounds hyperbolical. It is not juſt in its reference to the prophetical writings; and as to the hiſtorical books, they are, in general, remarkable for perſpicuity. The firſt quality by which the ſacred hiſtory is diſtinguiſhed is ſimplicity, which ariſes from this property of the Hebrew language, the verbs of which have not, like Greek and Latin, a variety of moods and tenſes, nor do they abound, like the modern languages, in auxiliaries and conjunctions. This quality very much conduces to the perſpicuity of its ſtyle. Of this ſimplicity we have an example in the firſt paragraph of Geneſis, conſiſting of five, not long, verſes, and containing not fewer than eleven ſentences, which are ſingularly ſimple; the ſubſtantives not being attended by adjectives, nor the verbs by adverbs, without ſynonyms, or ſuperlatives, or any effort towards expreſſing things in a bold, emphatical, or uncommon manner. In the Pentateuch, there is alſo a ſimplicity of ſentiment, ariſing from the very nature of the early and uncultivated ſtate of ſociety, about which its books are converſant, and this renders the narrative, in general, extremely clear and engaging. Beſides the ſimplicity of ſtructure, and the ſimplicity of ſentiment, there is another ſpecies of ſimplicity, for which Scripture hiſtory is more remarkable than any

other compositions of any language. This may be denominated simplicity of design. The subject of the narrative so engrosses the attention of the writer, that he disappears, as it were, from the view of the reader. He introduces nothing as from himself; no opinions of his own, no remarks, conjectures, doubts, or inferences; no reasoning about the cause or the effects of what is related. He never interrupts his reader with the display, either of his talents or his passions: he makes no digressions; he draws no characters; he supplies us merely with naked facts, from which we are left to collect the character. We observe no attempt to shine by means of the expression, composition, or sentiments. Plainness of language is always preferred, because it is the most natural, the most obvious, and the best adapted to all capacities. In this last sort of singularity, for which Xenophon among the Greeks, and Cæsar among the Latins, have been recommended, our Lord's biographers particularly excel. With respect to the first species of simplicity, or that of structure, the difference of the genius of the Greek language from that of the Hebrew must, without doubt, occasion some difference in the manner of Matthew, Mark, Luke, and John, from that of Moses; but the identity of idiom still occasions a strong resemblance between them. If Genesis, therefore, may be justly said to possess the *first* rank for simplicity of composition in the sentences, the Gospels are certainly entitled to the *second*: and John and Matthew have it in a higher degree than Mark and Luke. As to the second species, or simplicity of sentiment, the change of times, which is very great, as well as the difference of subjects, would necessarily confer the first degree of it upon the former. But in simplicity of object or design, the evangelists, of all writers, sacred and prophane, appear the foremost. Their manner is indeed, in some respects, peculiar and unrivalled. If we divert our attention from the historical, or narrative parts of the Bible, to the writings of the poets and prophets, we shall discover the animated, elegant, and sublime intermixed, as the subjects suggest, and the occasions require, with the simple and perspicuous. But for other particulars, in reference to this subject, see STYLE and TESTAMENT. See also the titles of the several books of the Bible, for the distinguishing character of their writers.

Having considered the appellations by which the Bible is distinguished, the books of which it consists, the time, and manner in which they were collected, their respective authors, and the language and style in which they were written, it may not be improper to subjoin a few observations on the genuineness and authenticity of the Scriptures, on their high original and divine authority, and on their great importance and utility.

It should here be considered, that the genuineness of the Scriptures proves the truth of the principal facts contained in them; to which purpose we may observe, that it is very rare to meet with any genuine writings of the historical kind, in which the principal facts are not true, unless it be in instances where both the motives which engaged the author to falsify, and the circumstances which gave some plausibility to the fiction, are apparent; neither of which can be alleged in the present case with any colour of reason. As this is rare in general, it is more rare, when the writer treats of things that happened in his own time, and under his own cognizance and direction, and communicates his history to persons under the same circumstances; all which may be said of the writers of the Scripture history. Besides, the great importance of the facts mentioned in the Scriptures makes it more improbable, that the several authors should either have attempted to falsify, or have succeeded in such an attempt. This is an argument for the truth of the facts, which proves the genuineness of the books at the same time. However, the truth of the facts is inferred more directly from their importance, if the genuineness of the Scriptures be previously allowed. The same observation may be applied to the great number of particular circumstances of time, place, persons, &c. mentioned in the Scriptures, and to the harmony of the books with themselves, and with each other. These are arguments both for the genuineness of the books, and truth of the facts distinctly considered, and also arguments for deducing the truth from the genuineness. Moreover, if the books of the Old and New Testaments were written by the persons to whom they have been ascribed, i. e. if they be genuine, the moral characters of these writers afford the strongest assurance, that the facts asserted by them are true. The sufferings which several of the writers underwent both in life and in death, in attestation of the facts delivered by them, furnish a particular argument in favour of these facts. Again, the arguments here alleged for proving the truth of the Scripture history from the genuineness of the books, are as conclusive in respect of the miraculous facts, as of the common ones. It may also be observed, that if we allow the genuineness of the books to be a sufficient evidence of the common facts which they record, the miraculous facts must also be allowed, from their close connection with the others. It is necessary to admit both or neither. We cannot conceive, that Moses should have delivered the Israelites from their slavery in Egypt, or conducted them through the wilderness for forty years, at all, in such manner as the common history represents, unless we suppose the miraculous facts intermixed with it to be true also. In like manner, the fame of Christ's miracles, the multitudes which followed him, the adherence of his disciples, the jealousy and hatred of the chief priests, scribes and pharisees, with many other facts of a common nature, are impossible to be accounted for, unless we allow, that he did really work miracles. And the same observations hold, in general, of the other parts of the Scripture history. We might urge a particular argument in favour of the miraculous part of the Scripture history, that may be deduced from the reluctance of mankind to receive miraculous facts; which would put the writers and readers very much upon their guard, and would operate as a strong check upon the publication of a miraculous history at or near the time when the miracles were said to be performed; and thus it would serve as a strong confirmation of such an history, if its genuineness be previously granted. The converse of the proposition, now stated and explained, is also true: i. e. if the principal facts mentioned in the Scriptures be true, they must be genuine writings.

In connection with the preceding proposition we may observe, that the genuineness of the Scriptures proves their divine authority. Porphyry in effect acknowledges the truth of this proposition, in its reference to the book of Daniel, by being unable to devise a method of invalidating its divine authority implied in the accomplishment of the prophecies which it contains, without asserting, that they were written after the event, or that they were forgeries. Many of the other books of the O. and N. Testaments have unquestionable evidences of the divine foreknowledge, if they be allowed genuine: such are those supplied by Moses's prophecy concerning the captivity of the Israelites, or of a state not yet erected; Isaiah's concerning Cyrus; Jeremiah's concerning the duration of the Babylonish captivity; Christ's concerning the destruction of Jerusalem, and the captivity that was to follow; St. John's concerning the great corruption of the Christian church; and Daniel's concerning the fourth empire in its declension; which last was extant in the time of Porphyry, at least, that is, before the events which

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it repreſents. The truth of the propoſition might alſo be argued from the ſublimity and excellence of the doctrines contained in the Scriptures; in no reſpect ſuiting the ſuppoſed authors, or the ages in which they lived, their education or occupation; ſo that, if they were the real authors, we are under the neceſſity of admitting the divine aſſiſtance. The converſe of this propoſition, *viz.* that the divine authority of the Scriptures infers their genuineneſs, will be readily and univerſally acknowledged. And there are ſeveral evidences for the Divine authority of the Scriptures, which are direct and immediate, and prior to the conſideration both of their genuineneſs, and of the truth of the facts contained in them. Moreover, the truth of the principal facts contained in the Scriptures proves their divine authority. Such is the frame of the human mind, that the Scripture hiſtory, allowed to be true, muſt convince us that Chriſt, the prophets, and the apoſtles, were endued with a power greater than human, and acted by the authority of a Being of the higheſt wiſdom and goodneſs. But if natural religion be previouſly eſtabliſhed, the truth of the principal facts of the Scriptures proves their divine authority in a more eaſy and more convincing manner: for the knowledge and power manifeſted by Chriſt, the prophets, and apoſtles, and alſo their good moral characters, ſhew them to be in an eminent manner the children, ſervants, and meſſengers of him, who is previouſly acknowledged to be infinite in power, knowledge, and goodneſs; and they actually lay claim to a divine miſſion, which claim cannot be thought a falſe one, if we admit their credentials: or, in other words, the truth of the principal facts mentioned in the Scriptures proves the divine miſſion of Chriſt, the prophets, and apoſtles, that is, the divine authority of the Scriptures.

By ſuch mode of reaſoning it is ſhewn, that the genuineneſs of the Scriptures, the truth of the principal facts contained in them, and their divine authority, appear to be ſo connected with each other, that any one being eſtabliſhed upon independent principles, the other two may be inferred from it. On the ſubject of the inſpiration of the Scriptures, ſee INSPIRATION.

Another argument in proof of the genuineneſs of the books of the Old and New Teſtaments, and of the truth of the principal facts contained in them, may be deduced from the manner in which they have been tranſmitted down from one age to another; reſembling that, in which all other genuine books and true hiſtories have been conveyed down to poſterity. As the writings of the Greek and Roman writers were eſteemed by theſe nations to be tranſmitted to them by their anceſtors in a continued ſucceſſion, from the times when the reſpective authors lived, ſo have the books of the Old Teſtament by the Jewiſh nation, and thoſe of the New by the Chriſtians; and it is an additional evidence in the laſt caſe, that the primitive Chriſtians were not a diſtinct nation, but a great multitude of people diſperſed through all the nations of the Roman empire, and even extending itſelf beyond the bounds of that empire. As the Greeks and Romans always believed the principal facts of their hiſtorical books, ſo the Jews and Chriſtians did more, and never ſeem to have doubted of the truth of any part of theirs. In ſhort, whatever can be ſaid of the traditional authority due to the Greek and Roman writers, ſome thing analogous to this, and for the moſt part of greater weight, may be urged for the Jewiſh and Chriſtian. Now, as all ſober-minded perſons admit the books uſually aſcribed to the Greek and Roman hiſtorians, philoſophers, &c. to be genuine, and the principal facts related or alluded to in them to be true, and that one chief evidence for this is the general traditionary one here recited; they ought, therefore, to pay the ſame regard to the books of the Old and New Teſtaments, ſince there are the ſame, or greater reaſons for it. Beſides, theſe traditionary evidences are ſufficient, and we thus obtain a real argument, as well as one "ad hominem," for receiving books thus handed down to us. For it is not conceivable, that whole nations ſhould either be impoſed upon themſelves, or concur to deceive others, by forgeries of books or of facts. Theſe books and facts muſt, therefore, in general, be genuine and true; and it is a ſtrong additional evidence of this, that all nations muſt be jealous of forgeries for the ſame reaſons that we are. On the concluſiveneſs of this argument, as it relates to miracles; ſee MIRACLE.

We may proceed to obſerve further, that the great importance of the hiſtories, precepts, promiſes, threatenings, and prophecies contained in the Scriptures, are evidences both of their genuineneſs, and of the truth of the principal facts mentioned in them. The hiſtory of the creation, fall, deluge, longevity of the patriarchs, diſperſion of mankind, calling of Abraham, deſcent of Jacob with his family into Egypt, and the precepts of abſtaining from blood, and of circumciſion, were of ſuch concern, either to mankind in general, or to the Iſraelites in particular, and ſome of them of ſo extraordinary a nature, as that it could not be a matter of indifference to the people amongſt whom the account given of them in Geneſis was firſt publiſhed, whether they received them or not. On the ſuppoſition that this account was firſt publiſhed amongſt the Iſraelites by Moſes, and then confirmed by clear, univerſal, uninterrupted tradition, it will be eaſy to conceive, how it ſhould be handed down from age to age amongſt the Jews, and received by them as indubitable. But ſuppoſing the account to be falſe, or that there were no ſuch veſtiges and evidences of theſe hiſtories and precepts, it will be difficult to conceive how this could have happened, let the time of publication be what it may. If early, the people would reject at once the account for want of a clear tradition; if late, it would be natural to enquire how the author was informed of things never known before to others. If the account was delivered, as having been communicated to Moſes by divine revelation, which is not very conſiſtent with the numerous references that occur in Geneſis to the exiſting veſtiges of the things related, his fictitious credentials would thus be embarraſſed, and his contemporaries would be induced very particularly to examine them. As to other coſmogonies and theogonies current among Pagans, which are evident fictions; they furniſh no juſt objection againſt the Moſaic hiſtory; becauſe they were generally regarded merely as amuſing fictions; and yet they concealed in figures, or expreſſed in plain words ſome truths, which agree with the book of Geneſis, and afford a ſtrong preſumptive evidence in favour of this book. With reſpect to the law of Moſes, this was extremely burdenſome, expenſive, and ſevere, particularly in its reference to the crime of idolatry, to which mankind were then extravagantly prone; and it was abſurd, according to human judgment, in the inſtances of prohibiting their furniſhing themſelves with horſes for war, and of commanding all the males of the whole nation to appear at Jeruſalem three times a year. Nevertheleſs, it claims a divine authority, and appeals to facts of the moſt notorious kind, and to cuſtoms and ceremonies of the moſt peculiar nature, as the memorials of theſe facts. Can we then conceive, that any nation, with ſuch motives to reject, and ſuch opportunities of detecting, the forgery of the books of Exodus, Leviticus, Numbers, and Deuteronomy, ſhould yet receive them, and ſubmit to this heavy yoke? That the Jews did ſubmit to the law of Moſes in theſe circumſtances, is evident from the books of the Old and New Teſtaments, if we allow them the leaſt truth and genuineneſs, or even from profane writers; and from the preſent obſervance

ſervance of it by the Jews ſcattered through all the kingdoms of the world. Should it be ſaid, that other nations have aſcribed divine authority to their lawgivers, and ſubmitted to very ſevere laws, it may be alleged in reply, that the pretences of lawgivers amongſt the Pagans to inſpiration, and the ſubmiſſion of the people, may be accounted for from their peculiar circumſtances at the time, without recurring to real inſpiration; and more eſpecially, if we admit the patriarchal revelations related by Moſes, and his own divine legation, as heathen lawgivers copied after theſe, and hence we derive a ſtrong argument in their favour. Beſides, no inſtance occurs among the Pagans, of a body of laws framed at once and remaining invariable; whereas the body politic of the Iſraelites aſſumed a complete form at once, and has preſerved it with little variation, to the preſent time, and under many external diſadvantages; thus ſupplying us with an inſtance altogether without parallel, and ſhewing the high opinion which they entertained of the great importance of their law. In ſhort, of all the fictions or forgeries, that can happen among any people, the moſt improbable is that of the Jewiſh body of civil laws, and it ſeems to be utterly impoſſible in the caſe of the law of Moſes.

If we further examine the hiſtory contained in the books of Joſhua, Judges, Ruth, Samuel, Kings, Chronicles, Ezra, and Nehemiah, and extending from the death of Moſes to the re-eſtabliſhment of the Jews after the Babyloniſh captivity by Ezra and Nehemiah, we ſhall find a variety of important facts, moſt of which muſt be ſuppoſed to leave ſuch veſtiges of themſelves, either external and viſible, or internal in the minds and memories of the people, as would verify them if true, or cauſe them to be rejected, if falſe. The conqueſt of the land of Canaan, the diviſion of it, and the appointment of cities for the prieſts and Levites by Joſhua; the frequent ſlaveries of the Iſraelites to the neighbouring kings, and their deliverance by the judges; the creation of a kingdom by Samuel; the tranſlation of this kingdom from Saul's family to David, with his conqueſts; the glory of Solomon's kingdom; the building of the temple; the diviſion of the kingdom; the idolatrous worſhip ſet up at Dan and Bethel; the captivity of the Iſraelites by the kings of Aſſyria; the captivity of the Jews by Nebuchadnezzar; the deſtruction of their temple; their return under Cyrus, rebuilding the temple under Darius Hyſtaſpis, and re-eſtabliſhment under Artaxerxes Longimanus, by Ezra and Nehemiah;—theſe events are ſome of them the moſt glorious, and ſome of them the moſt reproachful, that can happen to any people. How can we reconcile forgeries of ſuch oppoſite kinds, and eſpecially as they are interwoven together by various complicated and neceſſary connections, which do not admit of ſeparation? The facts, indeed, are of ſuch importance, notoriety, and permanency in their effects, that no particular perſons among the Iſraelites could firſt project the deſign of feigning them, that their own people would not concur with ſuch a deſign, and that neighbouring nations would not permit the fiction to paſs. Nothing but the invincible evidence of the facts, here alleged, could induce a jealous multitude amongſt the Iſraelites or neighbouring nations to acquieſce. This muſt be acknowledged upon the ſuppoſition that the ſeveral books were publiſhed in or near the times when the facts that are recorded in them happened. But ſuppoſe all theſe hiſtorical books forged by Ezra;—the hypotheſis is evidently impoſſible. Things ſo important and notorious, ſo honourable and ſo reproachful to the people, for whoſe ſake they were forged, would have been rejected with the utmoſt indignation, unleſs there were the ſtrongeſt and moſt genuine traces of theſe things already amongſt the people. They muſt therefore, in part at leaſt, be true. If it be ſaid that additions were made by Ezra; theſe additions muſt have been either of important or trivial matters. On the firſt ſuppoſition, the difficulty already ſtated recurs; and if the important facts are true, what poſſible motive could have induced Ezra to make additions of no importance? Beſides, if any ancient writings were extant, Ezra muſt either copy after them, which deſtroys the preſent ſuppoſition; or differ from and oppoſe them, which would betray him. If there were no ſuch ancient writings, the people would be led to enquire with regard to matters of importance, for what reaſon Ezra was ſo particular in things of which there was neither any memory, nor account in writing. Should it be ſaid, that the people did not regard what Ezra had thus forged, this reduces the ſubject in queſtion to matters of ſmall, or of no importance. Beſides, why ſhould Ezra write, if no one would read, or regard? Farther, Ezra muſt have had, like other men, friends, enemies, and rivals; and ſome, or all of theſe, would have been a check upon him, and a ſecurity againſt him in matters of importance. If we ſuppoſe theſe books, inſtead of having been forged at once, to have been forged ſucceſſively, at the interval of one, two, or three centuries after the facts related, we ſhall involve ourſelves in the ſame or ſimilar difficulties. Upon the whole, then, we may conclude, that the forgery of the annals of the Iſraelites appears to be impoſſible, as well as that of the body of their civil laws. It is needleſs to examine the books of Eſther, Job, the Pſalms, Proverbs, Eccleſiaſtes, and Canticles; and we might proceed to the Prophecies. But this ſubject will be reſumed under the article PROPHECY. For the importance of the ſubjects, comprehended in the books of the New Teſtament; ſee TESTAMENT, and CHRISTIANITY.

We ſhall here ſubjoin ſome general evidences in atteſtation to the importance of the books of Scripture. That Jews and Chriſtians have thought their ſacred books very highly important, moſt genuine, and true, appears from the perſecutions and ſufferings which they have undergone on account of their attachment to them, and becauſe they would not be prevailed upon to ſurrender them. The preſervation of the law of Moſes, probably the firſt book written in any language, whilſt many others of a later date have been loſt, ſhews the great regard that has been paid to it; and from this circumſtance we may infer, that this and the other books of the Old Teſtament have been preſerved on account of their importance, or from ſome other cauſe, equally evincing their genuineneſs and truth. The great importance of theſe books appears alſo from the many early tranſlations and paraphraſes of them; and theſe tranſlations and paraphraſes ſeem to correct errors that are unavoidable in the laſpe of time, and to ſecure their integrity and purity. The heſitation and difficulty with which ſome few books of the New Teſtament were received into the canon, ſhew the great care and concern of the primitive Chriſtians about the canon, and the high importance of the books admitted into it; and afford a ſtrong evidence of their genuineneſs and truth. The ſame obſervation is in a degree applicable to the Jewiſh canon. Moreover, the religous hatred and animoſity which ſubſiſted between the Jews and Samaritans, and between ſeveral of the ancient ſects among the Chriſtians, convince us of what importance they all thought their ſacred books, and diſpoſed them to watch over one another with a jealous eye.

Farther, the genuineneſs of the books of the Old and New Teſtaments may be evinced from the language, ſtyle, and manner of writing uſed in them. The Hebrew language, in which the Old Teſtament was written, being the language of an ancient people, who had little intercourſe with their neighbours, would not change ſo faſt as modern languages have

have done, ſince different nations have been variouſly blended with one another by the extenſion of trade, arts, and ſciences; and yet ſome changes muſt have occurred in the interval that elapſed between the time of Moſes and that of Malachi. The Biblical Hebrew correſponds ſo exactly to this criterion, as to afford a conſiderable argument in favour of the genuineneſs of the books of the Old Teſtament. Beſides, theſe books have too great a diverſity of ſtyle to be the work of either one Jew, or of any ſet of contemporary Jews. If they be forgeries, there muſt have been a ſucceſſion of impoſtors in different ages, who concurred in the ſame iniquitous deſign. Again, the Hebrew language ceaſed to be ſpoken, as a living language, ſoon after the time of the Babyloniſh captivity; and it would be difficult or impoſſible to forge any thing in it, after it became a dead language. Hence it appears, that all the books of the Old Teſtament muſt be nearly as ancient as the Babyloniſh captivity; and as they could not all be written in the ſame age, ſome muſt be much more ancient, and this would reduce us to the neceſſity of ſuppoſing a ſucceſſion of conſpiring impoſtors. Moreover, there is, as we have already obſerved, a ſimplicity of ſtyle, and an unaffected manner of writing, in all the books of the Old Teſtament, which is a ſtrong evidence of their genuineneſs. The ſtyle of the New Teſtament, in particular, is not only ſimple and unaffected, but perfectly adapted to the time, places, and perſons. To which we may add, that the narrations and precepts of both the Old and New Teſtament are delivered without heſitation; the writers teaching as having authority; and this circumſtance is peculiar to thoſe, who unite with a clear knowledge of what they deliver, a perfect integrity of heart.

Another argument for the genuineneſs and truth of the Scriptures, is ſupplied by the very great number of particular circumſtances of time, place, perſons, &c. mentioned in them. It is needleſs to recount theſe; but they are incompatible with forged and falſe accounts, which do not abound in ſuch particularities, and the want of which furniſhes a ſuſpicion to their diſcredit. Compare, in this reſpect, Manetho's account of the dynaſties of Egypt, Cteſias's of the Aſſyrian kings, and thoſe which the technical chronologers have given of the ancient kingdoms of Greece, which are defective in ſuch particulars, with Thucydides's hiſtory of the Peloponneſian war, and Cæſar's of the war in Gaul, in which they occur, and the difference will be ſufficiently apparent. Dr. Paley's admirable treatiſe, entitled "Horæ Paulinæ," affords very valuable illuſtrations of this argument as it reſpects the genuineneſs of the books of the New Teſtament.

The agreement of the Scriptures with hiſtory, natural and civil, is a farther proof of their genuineneſs and truth. The hiſtory of the fall agrees in an eminent manner both with the obvious facts of labour, ſorrow, pain, and death, with what we ſee and feel every day, and with all our philoſophical enquiries into the frame of the human mind, the nature of ſocial life, and the origin of evil. Natural hiſtory bears a ſtrong teſtimony to Moſes's account of the deluge. Civil hiſtory affords many evidences, which corroborate the ſame account. (See Deluge.) The Moſaic account of the confuſion of languages, of the diſperſion of Noah's ſons, and of the ſtate of religion in the ancient poſtdiluvian world, is not only rendered probable, but in a very high degree eſtabliſhed, by many collateral arguments. See Confusion *of Languages*, Diſperſion *of Mankind*, Idolatry, Sacrifice, &c.

The agreement of the books of the Old and New Teſtaments, with themſelves and with each other, affords an argument both of their genuineneſs and truth. The laws of the Iſraelites are contained in the Pentateuch, and referred to, in a great variety of ways, direct and indirect, in the hiſtorical books, in the Pſalms, and in the Prophecies. The hiſtorical facts alſo in the preceding books are often referred to in thoſe that ſucceed, and in the Pſalms and Prophecies. In like manner, the goſpels have the greateſt harmony with each other, and the epiſtles of St. Paul with the Acts of the Apoſtles: and, indeed, there is ſcarcely any book of either the Old or New Teſtament, which may not be ſhewn to refer to many of the reſt, in one way or other. For the illuſtration of this argument, let us ſuppoſe that no more remained of the Roman writers than Livy, Tully, and Horace, would they not by their references to the ſame facts and cuſtoms, by the ſameneſs of ſtyle in the ſame writer, and difference in the different ones, and numberleſs other ſuch like circumſtances of critical conſideration, prove themſelves, and one another to be genuine, and the principal facts related, or alluded to, to be true? Whoever will apply this reaſoning to the preſent caſe will perceive, that the numberleſs minute, direct, and indirect agreements and coincidences, that preſent themſelves to all diligent readers of the Scriptures, prove their truth and genuineneſs beyond all contradiction. See Acts, Epiſtles, and Teſtament.

The harmony and agreement of the ſeveral writers of the Old and New Teſtament appear the more remarkable, when it is conſidered that their various parts were penned by ſeveral hands in very different conditions of life, from the throne and ſceptre down to the loweſt degree, and in very diſtant ages, through a long interval of time; which would naturally have led a ſpirit of impoſture to have varied its ſchemes, and to have adapted them to different ſtations in the world, and to the different viciſſitudes of every age. David wrote about 400 years after Moſes, and Iſaiah about 250 after David, and Matthew more than 700 years after Iſaiah. And yet theſe authors, with all the other prophets and apoſtles, write in perfect harmony, confirming the authority of their predeceſſors, labouring to reduce the people to the obſervance of their inſtructions, and loudly exclaiming againſt the neglect and contempt of them, and denouncing the ſevereſt judgments againſt ſuch as continued diſobedient. Conſequently, as the writers of the Holy Scriptures, though they all claim a divine authority, yet write in perfect connection and harmony, mutually confirming the doctrine and teſtimony of each other, and concurring to eſtabliſh the very ſame religious truths and principles, it is a ſtrong proof that they all derived their inſtructions from the ſame fountain, the wiſdom of God, and were indeed under the direction and illumination of the ſame ſpirit. This leads us to add, that the unity of deſign, which appears in the diſpenſations recorded in the Scriptures, is an argument not only of their truth and genuineneſs, but alſo of their divine authority. In order to perceive the force of this argument, it is only neceſſary to inquire what this deſign is, and how it is purſued by the ſeries of events and divine interpoſitions, recorded in the Scriptures. (See Diſpenſation.) We may further add, that divine communications, miracles, and prophecies, recorded in Scripture, are agreeable to natural religion, and even ſeem to be neceſſary in the infancy of the world. (See Miracle, Prophecy, and Revelation.) It ſhould alſo be conſidered, that the hiſtorical evidences in favour of the genuineneſs, truth, and divine authority of the Scriptures, do not become leſs from age to age; but, on the contrary, it may rather be preſumed, that they increaſe. Since the three great concurring events of printing, the reformation of religion in theſe weſtern parts, and the reſtoration of letters, ſo many more evidences and coincidences have been diſcovered in favour of the Jewiſh and Chriſtian hiſtories, as may ſerve, in ſome meaſure, to ſupply the want of

those that have been lost in the preceding times; and as this improvement of the historical evidences is likely to continue, there is great reason to hope, that they will grow every day more and more irresistible to all candid, serious inquirers.

The moral characters of Christ, the prophets, and the apostles, prove the truth and divine authority of the Scriptures. The characters of the persons who are said in the Scriptures to have had divine communications, and a divine mission, are so much superior to the characters that occur in common life, that we can scarcely account for the more eminent single ones, and much less so for so large a succession of them, continued through so many ages, without allowing the divine communications and assistance, which they allege. Notwithstanding considerable imperfections that pertained to many of these eminent persons, and the heinous occasional offences chargeable upon some of them, yet the impartial reader should consider, whether the prophets, apostles, &c. were not so much superior, not only to mankind at an average, but even to the best men among the Greeks and Romans, as is not fairly to be accounted for by the mere powers of human nature. If this statement should be disputed, their characters, however, are too good to allow the supposition of an impious fraud and imposture, which must have been the case if they had not divine authority. Besides, it should be recollected, that the undisguised and impartial manner in which the imperfections and faults of the eminent persons mentioned in Scripture are related, furnishes a remarkable additional evidence for the truth of such parts of the Scripture history in which such relations occur, besides such evidences as extend to the whole.

The excellence of the doctrine contained in the Scriptures is an additional evidence of their authority. This argument has great force independently of all other considerations. Suppose, for instance, that the author of the gospel, which goes under the name of St. Matthew, was not known, and that it was unsupported by the writers of the primitive times; yet such are the unaffected simplicity of the narrations, the purity of the doctrine, and the sincere piety and goodness of the sentiments, that it carries its own authority with it. The same observation is applicable in general to all the books of the Old and New Testaments: so that if there was no other book in the world besides the Bible, a man could not reasonably doubt of the truth of revealed religion. If all other arguments were set aside, we may conclude from this single consideration, that the authors of the books of the Old and New Testaments, whoever they were, cannot have made a false claim to divine authority. The Scriptures contain doctrines concerning God, Providence, a future state, the duty of man, &c. far more pure and sublime than can in any way be accounted for from the natural powers of men, so circumstanced as the sacred writers were. Let the reader consider whether it can be reasonably supposed, that Jewish shepherds, fishermen, &c. should, both before and after the rise of the heathen philosophy, so far exceed men of the greatest abilities and accomplishments in other nations, by any other means than divine communications. Indeed, no writers, from the invention of letters to the present times, are equal to the penmen of the books of the Old and New Testaments in true excellence, utility, and dignity; and this is surely such an internal criterion of their divine authority, as ought not to be resisted.

The many and great advantages which have accrued to the world from the Patriarchal, Judaical, and Christian revelations, prove the divine authority of the Scriptures. These advantages relate partly to the knowledge, and partly to the practice of religion. The internal worth and excellence of the Scriptures, as containing the best principles of knowledge, holiness, consolation and hope, and their consequent utility and importance in a moral and practical view, fully and directly demonstrate their divine original. The wonderful nature, and superior excellence, of the attempt made by Christ and his apostles, for reforming mankind, and making them happy in a future state, are evidences of their divine authority; which is farther illustrated and confirmed by the manner in which the love of God and of our neighbour is taught and inculcated in the Scriptures. This may also be inferred from the doctrine of the necessary subserviency of pain to pleasure, and from the mutual instrumentality of beings to the happiness and misery of each other, unfolded in the Scriptures. The divine authority of the Scriptures may be farther deduced from the superior wisdom of the Jewish laws, considered in a political light, and from the exquisite workmanship manifested in the tabernacle and the temple. The time and manner in which the Scriptures were written and delivered to the world, furnish arguments for their divine authority; nor is the want of universality in the publication of revealed religion any just objection to it. The exclusion of all great degrees of enthusiasm and imposture from the characters of Christ, the prophets, and apostles, prove their divine authority; and it may be also inferred, from the reception which Christ, his forerunners and followers, with their doctrines, have met with in all ages. See these arguments stated, illustrated, and applied at large in Hartley's Observations on Man, p. 350—421. See also on the subject of this article, Prideaux's Conn. vol. ii. 475—497, 8vo. Dupin's Hist. of the Canon. ch. i. and ii. Kennicott's state of the printed Hebrew text of the Old Testament, diss. ii. p. 295, &c. and Dissertatio Generalis, annexed to the second volume of his Hebrew Bible. Taylor's Scheme of Scripture Divinity, ch. 39. ch. 40.

The Jews, at first, were very reserved in communicating their Scriptures to strangers: despising and shunning the Gentiles, they would not disclose to them any of the treasures concealed in the Bible. We may add, that the people bordering on the Jews, as the Egyptians, Phœnicians, Arabs, &c. were not very curious to know the laws or history of a people, whom in their turn they hated and despised. Their first acquaintance with these books was not till after the several captivities of the Jews, when the singularity of the Hebrew laws and ceremonies induced several to desire a more particular knowledge of them. Josephus (Contr. Apion. p. 1033.) seems surprised to find such slight footsteps of the Scripture history interspersed in the Egyptian, Chaldæan, Phœnician, and Grecian histories; and accounts for it from this circumstance, that the sacred books were not as yet translated into Greek, or other languages, and consequently not known to the writers of those nations. The first version of the Bible was that of the LXX. into Greek, in the time of Ptolemy Philadelphus, about 280 years before Christ; though some maintain that the whole was not then translated, but only the Pentateuch; between which and the other books in the version of the LXX. critics find a great diversity in point of style and expression, as well as of accuracy. See SEPTUAGINT.

Various kinds of books have been composed on the Bible, either to explain the sense, or make its doctrine more obvious, to facilitate the remembrance of it, or to establish particular opinions from it; such as Introductions, Apparatuses, Summaries, Manuals, Histories, Expositions, Commentaries, Harmonies, &c.

Bibles are distinguished, according to their language, into Hebrew, Greek, Latin, Chaldee, Syriac, Arabic, Coptic, &c: some account of each, and their several editions, &c. we shall here subjoin.

Bibles, *Hebrew*, are either manuſcript or printed. The beſt *manuſcript* Bibles are thoſe copied by the Jews of Spain. Thoſe copied by the Jews of Germany are leſs exact, but more common. The two kinds are eaſily diſtinguiſhed from each other; the former being in beautiful characters, like the Hebrew Bibles of Bomberg, Stephens, and Plantin; the latter in characters, like thoſe of Muſſter, and Gryphius. F. Simon obſerves, that the oldeſt manuſcript Hebrew Bibles are not above ſix or ſeven hundred years old; nor does rabbi Menaham, who quotes a vaſt number of them, pretend that any of them exceed ſix hundred years.

Dr. Kennicott, in his Diſſertatio Generalis, annexed to his Hebrew Bible, p. 21. obſerves, that the moſt ancient MSS. were written between the years 900 and 1100; but though thoſe that are the moſt ancient are not more than 800 or 900 years old, they were tranſcribed from others of a much more ancient date. The MS. preſerved in the Bodleian library is no leſs than 800 years old. Another MS. not leſs ancient, is preſerved in the Cæſarean library at Vienna. The ſame learned writer informs us, that almoſt all the Hebrew MSS. of the Old Teſtament, which are known at preſent, were written between the years 1000 and 1457; and hence he infers, that all the MSS. written before the years 700 or 800, were deſtroyed by ſome decree of the Jewiſh ſenate, on account of their many differences from the copies then declared genuine. This circumſtance is alſo alleged by Walton (Prolegomena, 4, 8.). as the reaſon why we have ſo few copies of the age of 600 years, and why even the copies of 700 or 800 years are very rare.

The Hebrew diſtinctions and denominations of the various parts of the Hebrew Bible, as they occur in the titles of the ancient MSS. will be eaſily underſtood by the following table of diſtribution.

Pentateuch,				
Prophets,	*Prior*	Joſhua Judges Samuel Kings.		
	Poſterior	*Major*	Iſaiah Jeremiah Ezekiel.	
		Minor	Hoſea, &c. to Malachi.	
Cethubim, or Hagiographa,	Job Pſalms Proverbs Daniel Ezr. Neh: Chronicles.	*Megilloth*,	Ruth Eſther Eccleſiaſtes Lamentations Solomon's Song.	

Dr. Kennicott, by the induſtry of his reſearch, has formed a catalogue of the titles and places of above 440 different MSS. of the whole, or of parts of the Hebrew Bible: a number about three times as great as that of the Greek MSS. of the New Teſtament, which have been collected at a vaſt expence, and collated with a truly laudable zeal. (See Teſtament.) Of theſe MSS. 54 are preſerved in the Bodleian library at Oxford, and 13 in different colleges of the univerſity; 4 are repoſited in the public library at Cambridge, and 3 in different colleges; 27 are found in the Britiſh Muſeum; one in the Lambeth library; and one in the library of the Royal Society. The preceding MSS., with 7 copies of the Samaritan Pentateuch, amount to 110 copies, making 125 volumes. Other MS. copies are preſerved at Alcala, or Complutum in Spain, Altorf in Swabia, Amſterdam, Anhalt-Deſſau, Augſburg, Baden, Berlin, Berne, Beſançon, Bologna, Brieg in Sileſia, Chiafong-feu in China, Cairo in Egypt, Ceſena in Italy, Copenhagen, Dreſden, Erfurth, Florence, Furth in Franconia, Hague, Hall, Hamburgh, Hanover, Heidelberg, Helmſtadt, Heſſe-Caſſel, Hobà near Damaſcus, Iena, Koningſberg, Leipſic, Leyden, Lyons, Mechlin in Flanders, Milan, Modena, Nuremberg, Padua, Paris, Pekin, Rome, Schaffhauſen in Swiſſerland, Straſburgh, Toledo, Trevigio near Venice, Turin, Venice, Vienna, Ulm in Swabia, Upſal, Utrecht, Wratiſlaw, Zerbſt in Saxony, and Zurich. Beſides theſe, there are others at Fez in Africa, Theſſalonica in Greece, and Conſtantinople, Ethiopia, Malabar, and Couchin, at a ſmall diſtance ſouth of Cranganore, where are about 4000 Jews, who have a ſynagogue, in which are carefully kept their records, engraven on copper plates, and where, it is ſaid, they can ſhew their hiſtory from Nebuchadnezzar to the preſent time. See the ſequel of this article.

The moſt ancient *printed* Hebrew Bibles are thoſe publiſhed by the Jews of Italy, eſpecially of Peſaro and Breſſe. Thoſe of Portugal, alſo, printed ſome parts of the Bible at Liſbon before their expulſion.—This may be obſerved in the general, that the beſt Hebrew Bibles are thoſe printed under the inſpection of the Jews; there being ſo many minutiæ to be obſerved, that it is ſcarcely poſſible for any other to ſucceed in it.

The firſt printed edition of the Hebrew Bible, or at leaſt of that part of it, comprehending the prior prophets, was printed at Soncinum in 1486, according to Le Long (Biblioth. Sacra.); it contained alſo the poſterior prophets, according to Wolfius (Bib. Heb. ii. 397.); and it ſeems to have made a firſt or a ſecond part to the next we ſhall mention, or Dr. Pellet's, which is regularly the third. The edition preſented by Dr. Pellet, in 1735, to the library of Eton college, being that of a third part of the Hebrew Bible, comprehending the Cethubim or Hagiographa, was printed at Naples in 1487. This whole edition was burnt by the Jews, excepting this copy, which had the ſingular good fortune of eſcaping the flames. It is printed on vellum, in two folio volumes, and has many readings different from all the other printed copies, and contrary to the Maſora, which probably was one of the reaſons for which the whole edition was deſtroyed. This edition is mentioned by Wolfius in his "Bibliotheca Hebræa," as formerly belonging to Schræder of Gluckſtadt. The antiquity of this edition is argued from its being printed on vellum, as was the caſe with the firſt [illegible], which are not found in any later edition. The firſt edition of the whole Hebrew Bible was printed at Soncinum in 1488, and is mentioned by Le Long, who ſays that it was printed by Abraham, the ſon of Rabbi Hhaim, or Chaim. Le Long and Wolfius affirm, that they ſaw an Hebrew Bible in 8vo. printed at Breſcia in 1494.

In the beginning of the 16th century, Dan. Bomberg printed ſeveral Hebrew Bibles in folio and quarto, at Venice, moſt of which are eſteemed both by the Jews and Chriſtians: the firſt in 1518, (the dedication being dated in 1517) which is the leaſt exact, and generally goes by the name of Felix Pratenſis, the perſon who reviſed it, and who, as Hody ſays, (p. 461.) was "ex Judæo Monachus." This edition contains the Hebrew text, the targum, and the commentaries of ſeveral rabbins. It is not known from what particular MSS. the Hebrew text of this edition was taken; but it agrees moſt with very late MSS. and ſuch as were corrected according to the Maſora. The editor, in his dedication to pope Leo, complains of the very corrupt ſtate of the Hebrew MSS., and ſpeaks of his having collated and corrected (probably by means of the Maſora) many MSS. which were uſed

-used for this edition. At the same time that this edition of the Hebrew Bible was preparing at Venice, another edition of equal fame was preparing by cardinal Ximenes, at Complutum in Spain; and as these two capital editions were thus in the press at once, neither of them could be printed from the other. But as they were both printed by men who either were, or had been Jews, (see Wolfius, tom. ii. p. 339.) from such MSS. as were uniformly corrected by the same Masora, they would exhibit almost universally the same text. And that the Hebrew MSS. here used, had suffered this Masoretical castigation, is plain from the words of Ximenes in his dedication to pope Leo. This famous Bible was begun in 1502, and finished in 1517; but not published till 1522, and not sold publicly, says Michaelis, (Lect. New Test. § 33.) till 1524. In 1526 or 1528, the same Bomberg printed the folio Bible of the celebrated Rabbi Jacob Ben Chaim, with his preface, the Masoretical divisions, a preface of Aben Ezra, a double Masora, and several various readings. No one who duly considers the preface of this editor (printed by Kennicott, Diss. vol. ii. p. 229.) can possibly doubt his having published it, according to the copies most exactly corrected by that Masora, which he profoundly reverenced. In 1549, was published the second edition of B. Chaim's Bible, with the famous preface at the beginning; and of this edition Le Long says, "præstantissima est et omnium optima, juxta quam præsertim sequentes prodierunt." Wolfius gives it precisely the same character; but adds, that Conrade Zeltner blames B. Chaim for being so excessively devoted to the Masora. In 1572, was published the Royal, or Spanish Polyglott, in 8 volumes, printed at Antwerp; principally under the direction of Arias Montanus. It is not pretended, that the least correction was made in this edition of the Hebrew text; nor could it be expected from an editor who believed the perfection of the Hebrew text. The third edition of B. Chaim's Bible was printed in 1618; it is the same with the second, but much more correct. From the former editions it was, that Buxtorf, the father, printed his rabbinical Hebrew Bible at Basil, in 1619; which, though there are many faults in it, is more correct than any of the former. This was the fifth edition of B. Chaim's Bible, in which the Hebrew text was copied exactly from B. Chaim's second edition. In 1534, Sebastian Munster published a Hebrew and Latin Bible, in 2 vols. fol. at Basil, with the commentaries of the Rabbins, and some notes; and Elias Hutter printed a Hebrew Bible in large letters, at Hamburgh, in 1587, fol. Robert Stephens's Hebrew Bible, with the Greek version from the Complutensian edition, the Latin vulgate, and another new Latin version, commonly called Vatablus's Bible, was printed in 1545. In 1623, appeared at Venice a new edition of the rabbinical Bible, by Leo of Modena, a rabbin of that city, who pretended to have corrected a great number of faults in the former edition; but, besides that it is much inferior to the other Hebrew Bibles of Venice with regard to paper and print, it has passed through the hands of the inquisitors, who have altered many passages in the commentaries of the rabbins. The rabbinical Bible of Bomberg and Buxtorf has been superseded by that of rabbi Moses, published at Amsterdam in 4 volumes folio, in 1724—1727. In 1641, was published, in 10 folio volumes, the Paris Polyglott, which, though it claims no merit from correcting the Hebrew text, will ever be honoured by men of true learning, for containing (besides the Syriac and Arabic versions) the first edition of the Samaritan pentateuch and its version, printed from MSS. brought into Europe between the years 1620 and 1630, and published by the learned Morinus, to whom the world is also indebted for many excellent remarks on the Hebrew text, as well as on the Samaritan pentateuch. In 1657, was published the London Polyglott, under the direction of the eminently learned Brian Walton, in which, however, the Hebrew text is printed Masoretically; almost in an absolute agreement with the many former editions, and with the latest and worst MSS. Although the editor has shewn clearly, that the Jewish transcribers have made many mistakes, and that the MSS. have many true readings, where the printed text is erroneous; and though he speaks (Proleg. 4. 12.) of having supplied some things which were not in the Venice or Basil editions, yet the only supplement which he has made is restoring the two verses in Joshua, which had been arbitrarily expelled by Masoretic authority. See POLYGLOTT.

As to Hebrew Bibles in 4to. that of R. Stephens, in 4 vols. Paris, 1539—1544, is esteemed for the beauty of the characters; but it is very incorrect. Plantin also printed several beautiful Hebrew Bibles at Antwerp: one in eight columns, with a preface by Arias Montanus, in 1571, which far exceeds the Complutensian in paper and print, and contents; this is called the Royal Bible, *Biblia Regia*, because it was printed at the expence of Philip II. of Spain; another at Geneva, in 1619; besides many more of different sizes, with and without points. Manasseh Ben Israel, a learned Portuguese Jew, published two editions of the Hebrew Bible at Amsterdam; the one in 4to. in 1635, who tells us in the preface, that he had altered a few letters; and where the most corrected copies differed, he took refuge in grammar rules and the Masora; the other in 8vo. in 1639: the first has two columns, and for that reason is commodious for the reader. It is printed with points, in an elegant type, and has the Keri and Chetib in the margin. The 8vo. edition has vowel points and accents, and the marginal notes. In 1639, R. Jac. Lombroso published a new edition in 4to. at Venice, with small literal notes at the bottom of each page, where he explains the Hebrew words by Spanish words. This Bible is much esteemed by the Jews at Constantinople: in the text they have distinguished between words where the point *kamets* is to be read with a *kamets-katuph*, that is, by *o*, and not an *a*.

Of all the editions of the Hebrew Bible in 8vo. the most beautiful and correct are the two of Jo. Athias, a Jew of Amsterdam. The first, of 1661, is the best paper, which, notwithstanding its being corrected according to ancient MSS. is certainly (so far as letters and words are concerned) agreeable only to the latest, as the other printed copies were before it: but that of 1667 is the most exact. This was published by Leusden, who tells the reader, "Tibi damus Biblia, impressa per Athiam, quibus correctiora nunquam sol aspexit." And yet, though the sun never saw so much implicit obedience paid to the Masora before, the Rabbins assure us, in their prefatory recommendation, that some whole words were here corrected "ex Masora & a Masoreticis, qui sepem legis fecerunt." This supremely Masoretical edition appeared to their high mightinesses the States-general, so particularly meritorious, that Athias, the typographer, was presented with a chain of gold, and a gold medal pendant. But it is somewhat extraordinary, that a Jew should thus be rewarded for an edition, in which Leusden (though a Christian) confesses, that he permitted the Latin contents, here added in the margin, to explain away some of the prophecies relating to the Messiah. Le Long, in loc.

Leusden's last edition of Athias was followed, in 1705, by Vander Hooght's very elegant edition. No corrections can be expected from this editor, who considered every letter in his book, howsoever it was introduced, as absolutely genuine, and maintained the Masora to be infallible.

After

After Athias, three Hebraizing proteſtants engaged in reviſing and publiſhing the Hebrew Bible; viz. Clodius, Jablonſki, and Opitius.—Clodius's edition was publiſhed at Frankfort in 1677, in 4to. At the bottom of the page it has the various readings of the former editions; but the author does not appear ſufficiently verſed in the accenting, eſpecially in the poetical books; beſides, as it was not publiſhed under his eye, many faults have crept in. That of Daniel Ernest Jablonſki in 1699, in 4to. at Berlin, is very beautiful as to letter and print: but, though the editor pretends he made uſe of the editions of Athias and Clodius, ſome critics find it ſcarcely in any thing different from the 4to. edition of Bomberg. For this man of eminent learning it was reſerved to lay the foundation for a reformation of the printed Hebrew text. This he has done in the preface, by making ſeveral excellent obſervations on the nature of the preſent Hebrew MSS.; with the proper marks of their antiquity, and the great advantages to be derived from them. He has ſatisfactorily ſhewn, that the Jewiſh tranſcribers have committed many miſtakes; that the Keris are various readings ariſing from the miſtakes of tranſcribers; that the older MSS. have them in the text, but the later in the margin; and conſequently, that the Maſora, which conſiders the Keri as in the margin, muſt be founded on the later copies; that one of the Hebrew MSS. at Berlin contains ſome thouſands of various readings, and that the other old Hebrew MSS. have numerous differences from the printed text; and that theſe old MSS. have ſuffered many alterations from the late correcting Maſorets. He alſo ſtates the poſſibility of procuring, by due zeal and exertion, very ancient MSS. from ſuch of the Jews as have been ſettled for many ages in China, Ethiopia, Conſtantinople, Theſſalonica, and other diſtant parts of the world. Jablonſki is the firſt author, who, after announcing the actual exiſtence of many various readings in the Hebrew MSS., has recommended both an accurate examination of thoſe MSS. now known, and a diligent ſearch after others, at preſent unknown, through the ſeveral quarters of the world. To him, therefore, belongs the honour of having planned the noble ſcheme for correcting the many corruptions of the printed Hebrew text of the Old Teſtament; and yet not daring to practiſe what he recommends, he republiſhed the Hebrew text almoſt the ſame as it was adjuſted Maſoretically in Leuſden's edition of 1667. His corrections have been confined almoſt entirely to the vowel-points and accents. The edition of Opitius was publiſhed in 4to. at Keil, in 1709; the character is large and good, but the paper bad: it is done with a great deal of care; but the editor made uſe of no manuſcripts but thoſe of the German libraries; neglecting the French ones, which is an omiſſion common to all three. Opitius copied from Leuſden's Athias, though, he ſays, he collated ſeveral MSS. in Berlin, and other places; but he idolized the Maſora, and held all readings inconſiſtent with it, however recommended by any MSS., in ſovereign contempt. Hence it follows, that if this edition was conformable to the late MSS. as regulated by the Maſora, the ſame Maſoretic influence muſt have regulated the very early copy, printed at Breſcia, in 1494; becauſe that edition is recommended by Opitius. Wolf. Bib. Heb. ii. p. 365. The three laſt mentioned editions have this advantage, however, that beſides the diviſions uſed by the Jews, both general and particular, into *parashas* and *peſukim*, they have alſo thoſe of the Chriſtians, or of the Latin Bible, into chapters and verſes; the *keri kethib*, or various readings, Latin ſummaries, &c. which made them of conſiderable uſe with reſpect to the Latin editions, and the concordances. See CHAPTERS.

The little Bible of R. Stephens in 16to. is very much prized for the beauty of the character. It was printed in 7 vols. at Paris, in 1544—1546. Care, however, muſt be taken; there being another edition of Geneva, exceedingly like it, excepting that the print is worſe, and the text leſs correct. To theſe may be added ſome other Hebrew Bibles without points, in 8vo. and 24to. which are much coveted by the Jews; not that they are more exact, but more portable than the reſt; and are uſed in their ſynagogues and ſchools: of theſe there are two beautiful editions, the one of Plantin, in 8vo. with two columns, and the other in 24to. reprinted by Raphalengius at Leyden, in 1610. There is alſo an edition of them by Laurens at Amſterdam, in 1631, in a larger character; and another in 12mo. at Frankfort, in 1694, full of faults, with a preface of M. Leuſden at the head of it.

In 1720, an Hebrew Bible was publiſhed at Hall, by the learned profeſſor John Henry Michaelis; being the firſt edition, which contained any various readings, collected from Hebrew MSS. by a Chriſtian editor. The text is taken from Jablonſki's edition, with ſome few emendations. There were collated for this Bible moſt of the beſt printed editions, and alſo five Hebrew MSS. belonging to the library at Erfurth. The propriety of ſelecting various readings from Hebrew MSS. and ancient verſions, is ſet forth in the preface; and the editor has inſerted here and there ſome variations of words and letters; but the variations, chiefly noted, relate to the minutiæ of criticiſm, conſiſting only in points and accents.

Charles Francis Houbigant, one of the fathers of the oratory at Paris, publiſhed an elegant edition of the Hebrew Bible at Paris, in 1753, contained in four volumes, folio. The text is that of Van der Hooght, without points, to which he has added marginal notes, correcting that text by the Samaritan pentateuch, Hebrew MSS. and ancient verſions; and alſo a new Latin verſion made by himſelf, expreſſive of ſuch a text as his critical emendations appeared to juſtify and recommend. This celebrated edition, (ſays Dr. Kennicott, than whom there could not be a more competent judge) ſeems to proceed upon ſo juſt a plan, as to its main principles, and to be executed (in the general) with ſo much ſkill and judgment, as to claim for its worthy author the applauſe [illegible] however, a wiſh, that the author had ſpared ſome of his bolder criticiſms, when they are unſupported by MSS., parallel places, or ancient verſions; eſpecially, where the propoſed emendations are not clearly and ſtrongly recommended by the context. Some learned men have wiſhed, that, inſtead of inſerting only a few ſelect various readings from the Hebrew MSS., all the various readings had been noted by the author after each chapter. But the labour of ſuch a work would have been immenſe; and we have great reaſon to be ſatisfied with what the learned and induſtrious editor has actually done. It has, indeed, been objected by Dr. Hodges, in his preface to the work entitled "The Chriſtian Plan," that Houbigant intended to alter the Hebrew text, to make it conformable to the Vulgate; whereas, it was the editor's profeſſed intention to ſet aſide the Vulgate, as being faulty and not anſwering his purpoſe, and to publiſh a new Latin verſion of his own. F. Houbigant obtained from the pope two gold medals, in teſtimony of his approbation of this edition. Dr. Kennicott, after himſelf twenty years' laborious collation of 694 copies, manuſcript and printed, of which about 600 are MSS. either of the whole, or of particular parts of the Bible, and nine years more ſpent in examining the Hebrew MSS., and recommending a collation of them, publiſhed, in 1776, the firſt volume of his Hebrew Bible, in folio, entitled

entitled "Vetus Teſtamentum Hebraicum, cum variis Lectionibus." The ſecond volume, with the general diſſertation, was publiſhed in 1780. The text is that of Everard Van der Hooght, in 1705, already mentioned, which is very correctly printed, with the ſimilar Hebrew letters, remarkably ſharp and well defined; differing from it only in the diſpoſition of the poetical parts, which Dr. Kennicott has printed in hemiſtichs, into which they naturally divide themſelves; however, the words follow one another in the ſame order as they do in the edition of Van der Hooght; ſo that any perſon may read theſe paſſages as proſe, if he is ſo inclined; or may divide the hemiſtichs differently, according to his own judgment. This edition is printed on an excellent type; the Samaritan text, according to the copy in the London Polyglott, is exhibited in a column parallel with the Hebrew text; thoſe parts of it only being introduced, in which it differs from the Hebrew: and the reſt of the Samaritan column being left blank, ſo that the eye perceives at once, with the utmoſt eaſe, the variations of the Hebrew and Samaritan texts. The numerous variations, both of the Samaritan manuſcripts from the printed copy of the Samaritan text, and of the Hebrew manuſcripts from the printed text of Vander Hooght, are placed ſeparately at the bottom of the page, and marked with numbers referring to the copies from which they are taken.

We ſhall ſubjoin to this article a brief account of the riſe and progreſs of that highly intereſting and meritorious undertaking, for the completion of which we are indebted to the indefatigable induſtry and perſeverance of the late Dr. Kennicott. A very general opinion ſeemed to have prevailed among learned men, till about the middle of the laſt century, in favour of the integrity of the Hebrew text: and Dr. Kennicott ingenuouſly confeſſes, that he was miſled by the common error. The Rabbins boldly aſſerted, and the Chriſtians implicitly believed, that the Hebrew text was free from error, and that in all the MSS. of it, no inſtance of any various reading of importance could be produced. The firſt perſon, who ſeems to have combated this notion in the way of a regular attack, was Ludovicus Capellus. From the differences he obſerved between the Hebrew text and the verſion of the LXX. and between the Hebrew pentateuch and the Samaritan pentateuch, from the palpable and manifeſt corruptions, which he thought he ſaw in the text itſelf, and from the many reaſons which induced him to ſuppoſe that the vowel points and the Maſora were both a modern and an uſeleſs invention, he was led to queſtion the general integrity of the text; and his enemies allowed, that in his attack upon it, he diſcovered much learning and ingenuity. Still, however, he acquieſced and admitted the uniformity of the MSS. But the matter was not brought to the teſt of an actual collation of any number of MSS. and verſions, and little was done, till Dr. Kennicott's attention was directed in 1748, by the late learned Dr. Lowth, biſhop of London, to an examination of 2 Sam. xxiii. 8. This circumſtance convinced him of his former error, and he was ſoon ſatisfied that the Hebrew text was far from being perfect, and that it was impoſſible to underſtand this ſingle verſe, without allowing that there were in it four corruptions. Kennicott's explanation of this verſe having been approved by Dr. Lowth, he was requeſted to examine the ſubſequent parts of the ſame chapter; which was likewiſe performed, and the whole was publiſhed in 1753. He proceeded to examine two parallel chapters in the firſt book of Chronicles, and the ſecond book of Samuel, and found an omiſſion in the former of no leſs than 34 Hebrew words. Although ſuch great corruptions were proved from the printed text itſelf, and from the ancient verſions, yet it had not at that time been ſuſpected, that there were now extant any Hebrew MSS. which would at all aſſiſt in correcting the faulty paſſages of the Old Teſtament. In the ſequel, however, this was found to be actually the caſe, for Dr. Kennicott, on examining ſome of the Hebrew MSS. in the Bodleian library, found that they contained, in the chapters above cited, ſeveral of the readings which he had recommended as genuine, before he had inſpected theſe MSS. A diſcovery ſo important to ſacred literature being thus begun in 1753, and extended to 70 Hebrew and Samaritan MSS. in Oxford, it was ſoon much improved by conſulting a number of others at Cambridge, and in London. The inquiry was promoted by means of a catalogue of all the other Hebrew and Samaritan MSS. which were then known to exiſt in different parts of the world, publiſhed by Dr. Kennicott in 1760, in a ſecond diſſertation on the Hebrew text. In this work he endeavoured to produce a general conviction, as to the certainty of the Hebrew printed copies being much corrupted, and the great advantages to be derived from MSS., by furniſhing many various readings of conſequence, which are the true ones; and by confirming the ancient verſion in a multitude of inſtances of little moment in themſelves, and therefore not likely to have originated from deſign. It was alſo proved, that the Samaritan Pentateuch was of great importance; that its MSS. would ſerve to correct a variety of typographical errors, which diſgraced the two printed editions; and that the Samaritan copies were frequently confirmed even by the Hebrew MSS.

In conſequence of theſe intereſting diſcoveries, Dr. Kennicott was ſolicited by the late archbiſhop Secker, and many other learned perſons, and by ſeveral ſocieties of literary men, particularly by the univerſity of Oxford, to whoſe countenance and encouragement the undertaking was recommended by the late Dr. Hunt, profeſſor of Hebrew and Arabic in that univerſity, to undertake a collation of all the Hebrew and Samaritan MSS. in our own country. Diſcouraged at firſt by the proſpect of ſo arduous an undertaking, he at laſt, in 1760, conſented to engage in it. Of his progreſs, and the circumſtances that attended it, we have a detailed account in the "Diſſertatio Generalis," publiſhed with the ſecond volume of his Bible. Having propoſed ten years as the time which, he thought, would be neceſſary for collating the Hebrew and Samaritan MSS., he was enabled by his ſingular aſſiduity to fulfil his own expectations and thoſe of the public. Patronized by his majeſty, and by a great number of liberal friends and well-wiſhers to the undertaking, both at home and in foreign countries, in the liſt of whom are no fewer than ſeven crowned heads, ſeveral princes, cardinals, archbiſhops, and biſhops, beſides univerſities, public libraries, and many of the moſt eminent literati in various parts of Europe; Dr. Kennicott inſtituted various and extenſive inquiries after MSS. at Conſtantinople, Warſaw, Venice, Bologna, Mantua, Pavia, Genoa, Liſbon, Geneva, Utrecht, Erfurt, Berlin, Stockholm, and Hamburgh. The numerous Hebrew MSS. of the latter place were collated by the celebrated Reimarus, who not only concurred in, but applauded the undertaking. In the proſecution of this work, it was diſcovered, that the printed editions of the Hebrew Bible, which had been ſuppoſed to agree, and on the agreement of which the notion of the integrity of that text had been founded, very much differed from one another; and particularly, that the *oldeſt* editions agreed moſt with the oldeſt and beſt MSS., and the *modern* editions with the lateſt and worſt MSS. As one proof of this, it is alleged, that the variations in the firſt edition (in 1488) from Van der Hooght (in 1705) amount to twelve thouſand. In the year 1767, Dr. Kennicott derived great advantage from his own examination of the Paris MSS., both Hebrew and Samaritan, and from

Dr. Gill's collation of all the passages quoted in the Talmud. An Hebrew MS., which once belonged to a synagogue at Jerusalem, was at this time purchased by his Britannic majesty; and our author himself, hoping to obtain other treasures from the East, sent to Canton, and had nearly succeeded in procuring a MS. from the Jews at Cai-fong-fu, in the province of Honan. But though he failed in China, he succeeded in America, and procured a complete Hebrew MS. from a Jew at New York. During the tenth and last year of this collation, eight Danish MSS. were sent to Oxford for the author's own examination, as were also six others from Toledo, by Dr. Bayer. Collations of other MSS. were furnished, at the same time, from Silesia, Cologne, Strasburg, Konigsburgh, Upsal, Leyden, and Ireland. The indefatigable author, having thus collected materials for his noble undertaking, an undertaking no less honourable to his country than to himself, proceeded to digest the variations, with which he was furnished, under their several books, chapters, and verses. During this operation, he formed a plan for a more complete scrutiny of the best MSS. through Europe, by sending some well-qualified person to re-examine the MSS. already collated, and to examine the rest in passages of greater moment, and where success seemed at all probable. Mr. (afterwards Dr.) Bruns, a learned German, was selected for this embassy; and he was honoured with letters from the secretaries of state here, to all our foreign ambassadors, as well as from the rulers of the two synagogues in London. The places in which he thus examined MSS., during a tour of three years, were Paris, Louvain, Cologne, Mentz, Worms, Manheim, Nuremburgh, Augsburgh, Stutgard, Carlsruhe, Strasburgh, Basle, Zuric, Berne, Geneva, Turin, Casale, Verulli, Milan, Genoa, Leghorn, Sienna, Rome, Florence, Bologna, Cesena, Modena, Reggio, Parma, Mantua, Padua, Venice, Udine, Goritia, Gradisca, Trieste, Vienna, Dresden, Leipsic, Erfurt, Jena, Dessau, Berlin, Hamburgh, Helmstadt, Cassel, Amsterdam, Utrecht, Leyden, and the Hague.

The variations contained in nearly 700 bundles of papers, being at last digested, including the collections made by Dr. Bruns; and the whole, when put together, being corrected by the original collations, and then fairly transcribed into 30 folio volumes, the work was put to the press in 1773; and both volumes (as we have already said), with the general dissertation, were finished in July 1780.

In order to evince the necessity as well as the utility of this work, Dr. Kennicott has presented us with a surprising detail of testimonies, which exhibit the opinions both of the Jews and Christians, as to the Hebrew text, from the earliest times down to the present. The Jewish testimonies are arranged under five distinct periods, viz. from the time of Malachi, about 420 years before the birth of Christ, to the commencement of the Christian æra; from Christ to the year 500 after Christ; from the year 500 after Christ to the year 1000; from this year to the invention of printing, about 1450; and from the invention of printing to the year 1780. The first Jewish testimonies are those of Josephus and Philo, who speak of the Greek version as perfectly agreeing with the Hebrew text in their time; whereas Dr. Kennicott asserts the corruption of the Hebrew text before the time of these Jews, and also the very great importance of the Greek version. For the pentateuch of this version being made about 280 years before Christ, and the other books being also translated into Greek about 100 years before Christ (as is inferred from the prologue to Ecclesiasticus), this version must have had many true readings, where the Hebrew was afterwards corrupted. Although in Ps. xvi. 10. the word for "thy holy one," which is now plural in the text of every copy expressed Masoretically, yet in the Greek version it is singular, which is the case in no less than 180 copies, agreeably to the quotations of St. Peter and St. Paul. And because the argument of these apostles urged upon the Jews, just after the resurrection of Christ, depends on this word's being truly singular, Dr. Kennicott considers this various reading as of greater moment than any other which was ever drawn forth from MSS. He observes, that as the Greek version thus helps to prove the Hebrew text corrupted when it *differs* from it, so where the Hebrew text is corrupted, and that version *agrees*, it proves the corruption to be older than the version, unless the version has since been assimilated to the Hebrew. Such very early corruptions occur, as he conceives, in Deut. x. 6. Gen. xi 32. and Gen. xxxvi. 31—43. The third instance contains 13 verses, which, not being written by Moses, were probably inserted from 1 Chronicles, i. 43—54. in some MS. of Genesis, into the margin, and thence taken into the text. This interpolation is so old as to be found in all the versions, and likewise in the Samaritan text. In the first instance, many words are omitted in the Hebrew text, and in all the versions, which are preserved only in the Samaritan text. In the second instance, the number 145 is corrupted into 205 in the Hebrew text, and in all the versions, and it is right only in the Samaritan text. Dr. Kennicott afterwards specifies two great corruptions: one, where the Greek version has been assimilated to the Hebrew, by *addition;* and another, in which the Syriac version has been thus accommodated, by *change*. The first relates to 20 verses, probably interpolated in 1 Sam. xvii.; and the second, to the word for *body* altered to the word for *ears*, in Psalm xl. 7.; on which word, body, the argument is grounded, in the 10th chapter of the epistle to the Hebrews: and a very old Syriac MS. in the royal library of Paris, translated from the Hebrew, has preserved the true word for *body;* and another has proved, that the Jews have altered their ancient copies, wilfully, from the Hebrew text and Greek version of Isaiah, xix. 18. respecting the temple at Heliopolis; and also from their turning Moses into Manasses, in Judges xviii. 30. Many other instances occur in the period now under consideration.

In the interval between the birth of our Saviour and the year 500, Dr. Kennicott remarks, that though the present Masora separates our tenth commandment into two, agreeable to the division now made by the Roman Catholics; yet the unity of this commandment, as made by Protestants, is expressly confirmed by Philo and Josephus; and the Masoretic mark of separation (at Exodus, xx. 17.) is absent from at least 234 Hebrew copies. Josephus is farther cited, as confirming the ancient chronology in the Greek version against that now in the Hebrew text; and likewise, as having a number much more credible as to the gold and silver left by David. The same historian also confirms the reading in the epistle to the Hebrews, chap. vii. 4. from Genesis xiv. 20. He confirms, too, the Syriac version, and the edition of Sixtus, reading four in 2 Sam. xv. 7, and the Vatican MS. reading four in 1 Sam. xvii. 4. And though the later Jews have taken Daniel out of their prophetical books, yet Josephus calls him a prophet, in the strongest terms. It appears further under this period, that the Hebrew MSS. differed at the time of the composition of the Talmud; and that some of the true readings may still be found in this work. This fact is confirmed by several instances, and particularly by Psalm xvi.

Under the third period Dr. Kennicott considers the subject of the *Keri*, which see. This period also includes a collection of 216 variations between the oriental and occidental MSS. Proofs of differences are likewise deduced from the old Jewish books,

books, Rabboth, Pirke Eliezer, and Cozri. Saadias, who flourished about the year 1000, is also referred to as having read differently from the printed text; and Hai, about the same period, is shewn to have followed those MSS., which were defective in Joshua, chap. xxi., where two whole verses, absolutely necessary, though expelled by the Masora, have been found in 149 Hebrew copies. At the end of this period, Dr. Kennicott introduces the Arabic version, generally ascribed to R. Saadias, which has hitherto been reputed only secondary, as if it had been always taken from the Greek or the Syriac; whereas it is honoured with the title of a primary version in several places; because it is found to agree with the Hebrew MSS. where both Greek and Syriac differ from it. This Arabic version has some very important readings, particularly in preserving that word which expresses the cause of God's anger against Balaam, Numb. xxii. 22. It is also important where it is only secondary; because it helps to determine the true reading of the Greek version, where the Greek MSS. are now at variance; as in Psalm xviii. 14. lxviii. 9. Micah v. 1. and Zechariah xiii. 7. To the close of this period, Dr. Kennicott refers the two oldest and best Hebrew MSS. now extant, one at Oxford, and the other at Vienna. Of the Bodleian MS., supposed to be 800 years old, he observes, that it contains about 14,000 variations. In the pentateuch of this MS. the Greek version is confirmed by 109 various readings; the Syriac, by 98; the Arabic, by 82; the Vulgate, by 88; and the Chaldee paraphrase, by 42. It also agrees with the Samaritan text, against the Hebrew, in 700 instances. This, it is added, is the only one which has preserved a word of great importance for understanding, 2 Sam. xxiii. 3—7; which word is confirmed by the Greek version, and recovers to us a prophecy of the Messiah.

The fourth period, from 1000 to 1450, is introduced with an observation, that the oldest Hebrew MS. which has a certain date (1106), though containing only 9120 verses, has above 6000 variations. The testimonies of Aben-Ezra, Jarchi, Maimonides, and Kimchi, who all flourished between 1150 and 1250, belong to this period. After taking notice of several true readings preserved by these four Rabbies, Dr. Kennicott introduces Meir Hallevi, who died in 1244, with his pathetic lamentation over the many variations in the Hebrew MSS.

Under the fifth and last period, from 1450 to 1780, including the printed Hebrew text, Dr. Kennicott takes particular notice of the five first editions of different parts, and of the first edition of the whole together. He adds, that the Psalms, as first printed in 1477, contain about 600 variations; and that the Hebrew Bible, as first printed in 1488, contains above 12,000. These, and some other very early editions, agree with the older MSS. much more than the editions after the year 1500, but still more than that by Jacob Ben Chaim, in 1526, which has been in general the standard down to the present time. About the year 1500, began the superstitious regard for the Masora; and such MSS. as had been masoretically corrected, were preferred for the editions of Cardinal Ximenes and Felix Pratensis. But the Masora being highly venerated by Ben Chaim, he chose for his text such MSS. as had the Masora most perfect; which MSS. were the latest and the worst: and yet, unfortunately, this text became the general standard for the Antwerp, Paris, and London Polyglotts, as well as for other editions of less note afterwards. The Jews have not, however, been satisfied with the correctness of Chaim's edition. For Rabbi Lonzano was afterwards encouraged to visit many countries, and to collate ten MSS. in order to render the text more perfect; and yet this complaint of errors was again renewed in 1635, by Manasseh Ben Israel. These testimonies are concluded with the Mantuan edition, called Minchath Shai, in which are about 2000 various readings, collected from MSS. and early editions, by Solomon Menorzi, in the last century: but it was not printed till 1744. So that, at the time when Christians were generally insisting on the perfection of the Hebrew text, the Jews were labouring to correct it, and lamenting its great imperfection in the following terms: "Quis restituet decus? Quis ejiciet raphanos et spinas? Horror confredit me: quum viderem multitudinem variantium, quæ ceciderunt in libros! Editores eunt obscurati, neque lux est eis; neque est qui quærit cessationem hujus diversitatis! Ecce nos palpantes tanquam cæci, in obscuritate diversitatum! Deus auferat tenebras nostras!"

On examining the testimonies of Christian writers with regard to the state of the Hebrew text, Dr. Kennicott begins with the Evangelists and Apostles; and here he adverts to the quotations made in the New Testament from the Old: on which subject, see QUOTATION. It appears, by unquestionable evidence, that the Old Testament has been corrupted, in many instances; and that a just correction of the Hebrew text, grounded on the authorities of Hebrew MSS., the Samaritan pentateuch, and the ancient versions, will, in many places, restore to the Old Testament that harmony with the New which it has long wanted. Instances occur in Gen. ii. 24.: Psalm xvi. xxxiv. 22. compared with John xix. 36, 37. and xl. compared with Hebrews x.; Jeremiah xxxi. compared with Hebrews viii.; Amos ix. compared with Acts xv.: Isaiah vii. 14. liii. 4. Psalm lxviii. 19. Hos. xiii. 14. Amos v. 26. Deut. xxxii. 5. and Habakkuk ii. 4. Many arguments are adduced by Dr. Kennicott to shew, that the Jews have corrupted the chronology, from the creation to Abraham, either by subtracting or by adding 1300 years; and this great corruption is not in the Greek version, but in the Hebrew text; and that it was introduced in the second century. As it was a very ancient tradition, that the Messiah was to come in the sixth chiliad, because he was to come in "the last days," (founded on a mystical application of the six days' creation), it was contrived to shorten the age of the world from about 5500 to 3760, and thence to prove that Jesus could not be the Messiah, because at the æra of his birth the time for the advent of the Messiah was not yet come. The time of this grand corruption is shewn to have been between the years 175 and 200. The old Italic version, made from the Greek about the year 100, is adduced to confirm some ancient readings of the Greek version, particularly as to the more extended chronology. Dr. Kennicott, after various pertinent quotations from Ignatius, Justin Martyr, and Irenæus, refers more particularly to Tertullian, with a view of proving that, in his time, the passage in Isaiah liii. 4. expressed the sense ascribed to it in the 8th chapter of St. Matthew, where the Evangelist quotes it as foretelling, that "the Messiah should heal bodily diseases." The Hebrew words, it is shewn, admit this sense: Tertullian so expresses them; and so did the old Greek version, which has been strangely altered in this place, out of opposition to the gospel. Origen is cited, as affording many interesting particulars, with regard to the differences in the Hebrew copies, and the true readings of the Greek versions; and Eusebius, Theophilus Antiochenus, Ephraim Syrus, Jerom, Epiphanius, Augustin, and Sulpicius Severus, are quoted to the same purpose. The first period of the Christian writers terminates with the oldest MSS. of the Greek version, particularly the Vatican and Alexandrian MSS. written about the year 400, which see. Dr. Kennicott proceeds to the period that elapsed between the years 500 and 1000, and avails himself

of the Syriac verſions (ſee SYRIAC) for introducing ſome uſeful obſervations on ſeveral paſſages, particularly Pſalm xl. 6, 7. 9. and 2 Kings viii. 16.; in which laſt paſſage three words are now interpolated in the Hebrew text, which, though they are alſo found in the Vatican and Alexandrian MSS. are not in the Complutenſian and Aldine editions; nor are they in an ancient manuſcript of Kings, nor in ſome of the beſt MSS. and earlieſt editions of the Vulgate. See VULGATE. From the year 1000 to 1450, the teſtimonies of Chriſtians are very few. Yet ſoon after the Jews fled from the Eaſt into Europe in 1040, the Hebrew language was ſtudied by ſeveral Chriſtians, particularly by Lanfranc and Anſelm, Groſthead and Roger Bacon; and this laſt learned man, with his Franciſcan brethren at Oxford, bought many Hebrew MSS. when the Jews were expelled from England in 1289. In the 13th century, Raymund Martini accuſed the Jews of corrupting the Hebrew text; and he ſpeaks of MSS. differing in Zech. xii. 10, with reſpect to which Dr. Kennicott obſerves, that forty copies have here the reading expreſſed in John xix. 37. Dr. Kennicott alſo cites Nic. Lyranus, Radulphus Armachanus, Toſtatus, Perez de Valentia, and Marſilius Ficinus.

Under the laſt period, from 1450 to 1780, Zuinglius takes the lead; and he extols the Greek verſion, and remarks the corrupt addition of Jer. chap. lii. Luther is alſo mentioned; and Bibliander is celebrated on account of his excellent criticiſm on Ezekiel xiii. 21. As it is very improbable that the news of the capture of Jeruſalem ſhould [illegible] nearly eighteen months in reaching Babylon, it will be ſatisfactory to know, on the authority of the Syriac verſion and eight Hebrew MSS., that this period was not more than ſix months. Having deſcribed the editions of Sixtus and Clement, Dr. Kennicott obſerves, that the preſent Engliſh verſion frequently expreſſes, not what the tranſlators found in their Hebrew text, but what they thought ſhould have been there; and that the 14th pſalm, inſerted in the liturgy of the Church of England, contains three verſes not found at preſent in the Hebrew text of that pſalm, but which are probably genuine. We have already mentioned Capellus's opinion on this ſubject; and yet though he proved the corruption of the Hebrew text, by every argument except that of MSS., Buxtorf, the ſon, following his father, who aſſerted the abſolute agreement of all the ancient MSS., affirmed that no Hebrew MS. in the world contained any various reading which agreed with either of the ancient verſions. It is needleſs to recite the opinions of Mede, Merinus, Beveridge, Walton, Hammond, Bochart, Huetius, Pocock, Le Clerc, &c. on this ſubject. We ſhall here only obſerve, with Dr. Kennicott, that Jablonſki was the firſt editor of an Hebrew bible, who ſpoke of any Hebrew MSS.; and he names four, by the help of which he made a few corrections. Nevertheleſs, he omitted the two neceſſary verſes in Joſhua, chap. 21. though Dr. Kennicott has eſtabliſhed them, in conſequence of the examination of 149 copies. Opitius declares that he, in his notes, obeyed the Maſora, in defiance of all the MSS. and editions of the world united. Vitringa has ſhewn, according to Dr. Kennicott, how a miſtake in one MS. may afterwards have been introduced into many, from the practice of correcting many MSS. by *one* as their ſtandard. The conjectural emendation made by this eminent biblical critic, in 2 Chron. xxvi. 5. is confirmed by fifty copies; and his reading of Iſaiah xix. 18. is eſtabliſhed by the Talmud and ſixteen Hebrew copies. J. H. Michaelis, although he publiſhed ſome various readings, omitted many variations of great moment, probably from an undue deference to the advocates of the integrity of the Hebrew text. Among theſe advocates we may reckon Wolfius, who maintained that miſtakes might exiſt in ſome MS. copies, but not in all; becauſe ſome one MS., or ſome one edition, always had the true reading. Carpzovius contended, that the Hebrew text has deſcended to us in the ſame ſtate of purity in which it was firſt found; not indeed in all the copies, but in thoſe of the better ſort; nor in theſe ſeparately, but in ſuch altogether: and he thought it needleſs to collect theſe from every quarter of the world, becauſe, in his opinion, thoſe which are near at hand will be ſufficient; a conceſſion which aboliſhes his former doctrine. The learned Hallet, in his notes on the Holy Scriptures, publiſhed in 1729, alleges as a reaſon why the quotations in the New Teſtament differ from thoſe of the Old, that the Hebrew copies have been altered ſince the days of the apoſtles. Biſhop Hare, with whoſe teſtimonies Dr. Kennicott concludes his catalogue of Chriſtian writers, contends earneſtly for admitting the corruption of the Hebrew text. He rejects the titles of many of the pſalms, as not given by the authors of theſe pſalms. He condemns the practice of varniſhing over, inſtead of correcting, the corrupted readings; and he laments that Hebrew MSS., the chief ſupport of criticiſm, were wanting.

Dr. Kennicott cloſes his account of his laudable undertaking, with evincing the great uſe to be derived from the Hebrew MSS. and ancient verſions, for amending the printed Hebrew text; and with exhorting perſons in power to render ſuch corrections ſubſervient to the public good, by procuring a more correct and a more intelligible Engliſh tranſlation, or rather a reviſal of the preſent Engliſh tranſlation of the Old Teſtament. Theſe MSS., he ſays, ſtrongly confirm the ancient verſions, and enable us to aſcend to the times of Jerom, of the Apoſtles, and even of Ptolemy Philadelphus: and, he adds, it now remains to be ſeen in what kingdom or country through Europe, will be manifeſted the greater zeal, for correcting the modern tranſlations of the Old Teſtament.

The work of which, for the gratification of our readers, and with a view of recording and tranſmitting the honour of our country, where it was undertaken, and of the age in which we live, we have given a copious account, will appear in its pre-eminent importance and utility, whenever it ſhall be applied to the deſirable purpoſe of aiding a public and authoritative new tranſlation of the Bible, or at leaſt, an effectual reviſion of the common verſion. In the tranſlation of particular books of Scripture, by biſhops Lowth and Newcome, and by others of inferior rank in the church, &c. we obſerve the advantage reſulting from Dr. Kennicott's labours; but their full benefit can only be enjoyed, when the tranſlation is complete, and authoritatively introduced into common uſe. It has contributed eminently to the honour of the king of Sweden, that he has been the firſt prince in Europe, who has iſſued his royal commands for executing a purpoſe of this kind: and Dr. Kennicott thinks, it would be criminal to ſuppoſe that Great Britain, which has enjoyed ſuch diſtinguished bleſſings of Providence, will be backward in ſo pious a deſign. No perſons, whatever be their rank either in the church or ſtate, can more laudably teſtify their veneration for the Holy Scriptures, and their concern for the information and benefit of the world, than by adopting and accompliſhing a meaſure of this kind. It would ſerve alſo to obviate many objections againſt the truth and authority of divine revelation. It has been urged by lord Bolingbroke, and by other writers on the ſide of ſcepticiſm or infidelity, "that if the Scriptures had been from God, they would always have been preſerved in their primitive purity." In oppoſition to ſuggeſtions of this kind, Dr. Kennicott ſhews, that neither the wiſdom nor the

the goodneſs of the Supreme Being can be juſtly impeached, from the ſuppoſition that many errors have crept into the preſent text; becauſe the moſt important matters are ſtill ſecure and certain, and men have always been able to derive from the Bible a rule both of faith and practice. For the illuſtration of this poſition, he appeals to the ancient churches, both Greek and Italian, and the modern churches of both Proteſtants and Roman Catholics; ſince, amongſt all theſe, their ſacred books taught them "what they muſt do to be ſaved;" though they contained many errors, the correction of which was very deſirable. Indeed, the integrity of the ſacred books could not have been preſerved without a "miracle," perpetual as to time and univerſal as to place, which would conſequently be a greater miracle than any in the Bible: nevertheleſs as many corruptions, in tranſcripts made from tranſcripts, ever ſince the year 400 before Chriſt, were unavoidable, it is happy that ſeveral verſions, made 1500 or 2000 years ago, will correct ſome of theſe corruptions; and that the Hebrew MSS. ſtill extant, will correct others. Upon the whole, it is of great importance, that the effect of theſe corrections ſhould appear in its whole extent, and as ſpeedily as poſſible, not only to Chriſtians in particular, but to the world in general.

The learned Dr. John Bernard Roſſi, profeſſor of divinity and the oriental languages in the Royal Academy of Parma, undertook to make a collection of the various readings of the Old Teſtament, in imitation of that of Oxford; and for this purpoſe he examined by himſelf, or his friends, 1470 MSS. or printed copies. Of foreign MSS. 210, which had been omitted by Dr. Kennicott, were collated in the moſt important paſſages; and of ancient editions, either in his own poſſeſſion, or to which he had acceſs, the number amounted to 288, of which 230 are ſuch as had not been collated by Dr. Kennicott. M. de Roſſi announced his deſign in a tract, entitled, "Apparatus Hebræo-Biblicus," and publiſhed at Parma in 1782, 8vo.; and he propoſed to comprize the reſult of his labours in 4 vols. 4to. The firſt volume was publiſhed at Parma in 1784, under the title of "Variæ Lectiones Veteris Teſtamenti, &c." or the various readings of the Old Teſtament, drawn from an immenſe number of MSS. and printed editions, compared with the Samaritan text and the ancient verſions, and examined and appreciated by the moſt accurate rules and principles of ſacred criticiſm. This volume contains the "Prolegomena," and a clavis of the books of Geneſis, Exodus, and Leviticus. In the introduction we have ſeveral curious critical diſcuſſions, from which we learn that this collection aſcertains, as Dr. Kennicott's valuable and judicious labours had before done, inſtead of invalidating the integrity of the ſacred text in matters of the greateſt importance; as all the MSS. notwithſtanding the diverſity of their dates, and of the places where they were tranſcribed, agree with reſpect to that which conſtitutes the proper eſſence and ſubſtance of divine revelation, namely, its doctrines, moral precepts, and hiſtorical relations. M. Roſſi charges the variations not merely on the copyiſts, but on the ignorance and temerity of the critics, who have, in all ages, been too ambitious of dictating to their authors, and who, inſtead of correcting the pretended errors of others, frequently ſubſtitute in their place real errors of their own. This author is of opinion, that the common reading of an ancient text ought never to be changed but by the authority of MSS.; and if there be any exceptions to this general rule, they are very rare: and the conjectural alterations of critics ſhould be thrown into the notes. M. Roſſi, however, obſerves, that we muſt not confound the alterations introduced into the ſacred text by the injuries of time, the negligence of tranſcribers, or the boldneſs of critics, with thoſe which have been made by public authority. The ſacred writers of ancient times left, as he ſays, their records to other writers, who were often their diſciples, as alſo to public ſcribes, and to magiſtrates, who reviſed them. In this reviſion, which was executed either by ſacred authors, or by the public authority of the ſynagogue, corrections and retrenchments were made, where they were judged neceſſary. This, M. de Roſſi thinks, appears evident from the preſent ſtate of the ſacred writings; and in confirmation of his opinion, he quotes the Syriac Interpreter, who, in a note placed at the end of the Pentateuch, ſays, that this work was compoſed by Moſes, but was afterwards digeſted and finiſhed by Joſhua. He alſo conjectures that Moſes himſelf made uſe of ancient records, both in his hiſtory of the creation, and in that of the deluge. He thinks that the frequent repetitions and anachroniſms, which are diſcernible in the book of Geneſis, ought rather to be attributed to a writer anterior to Moſes, than to ſcribes in after-times; or to the confuſion of the ancient records themſelves, as ſome have imagined. This opinion was propoſed and maintained with ſingular ingenuity and erudition, before the time of Roſſi, in a French work publiſhed at Bruſſels in 1753, and entitled "Conjectures concerning the original memoirs, which Moſes appears to have made uſe of in compoſing the book of Geneſis, together with remarks deſigned to confirm or illuſtrate the ſeveral conjectures." The reviſion, ſays Roſſi, which Ezra made of the ſacred writings, with the aſſiſtance of MSS. and according to the rules of criticiſm, both on his own authority as a ſacred writer, and that of the council of which he was a member, did not annul the MSS. that were anterior to his time, either in the hands of the Samaritans, or in thoſe of the Jews, from which thoſe of the Cuthites or Samaritans had been taken, or in the hands of the Egyptians, or in thoſe of the Babylonian Jews, who did not return to the holy land. The edition of Ezra remained entire till the deſtruction of Jeruſalem; but it underwent ſeveral alterations before the time of the Maſorites, whoſe critical labours or attempts with a view of ſecuring the ſacred code againſt future injuries are well known. Yet, notwithſtanding theſe attempts and labours, ſome faults, which were anterior to their time, ſtill remained; and others, though of little conſequence, afterwards crept into the ſacred text. The only ſources from which we can derive warrantable corrections of theſe faults are, according to this author, the MSS., the ancient editions, the Samaritan text, the ancient verſions, the parallel places, the analogy of the text or of the hiſtory, the teſtimonies of ancient writers, critical conjectures, and the Maſora, which De Roſſi treats with more reſpect than Dr. Kennicott, of whom he complains on that account. He ſubjoins many learned and judicious obſervations on the various ſources, from which materials are to be derived for the neceſſary corrections. As to the MSS. he lays down rules for aſcertaining their age, of which the moſt obvious is the date; and in order to underſtand their dates, he takes notice of the various methods of computing time employed by the Jews, and the different eras from which they reckon. When the dates are wanting, it becomes difficult to aſcertain the time of a MS., if it be anterior to the thirteenth century. Thoſe which are anterior to the twelfth century are very rare; and the author minutely indicates the marks that diſtinguiſh them. The rarity of the ancient Hebrew MSS. has been occaſioned by the Jewiſh cuſtom of depoſiting their books and phylacteries in public places, from whence, to make place for others, they have been taken and buried in wells, or under ground, where they ſoon rot. Thoſe of a very remote antiquity, which are no longer extant,

tant, are often restored, in part, by copies which still subsist. With regard to ancient editions, De Rossi distinguishes the Masoretic from those editions without the Masora, which are anterior to the year 1525, when the rabbinical Bible of Jacob Ben Chaim was published. Of 242 which he has collected, he reckons 30 which belong to the fifteenth century, and above 60 which are anterior to the first Masoretic Bible. The ancient versions enumerated by the author are the Greek, Chaldaic, Syriac, Arabic, and Persian; and among these, the Greek version of the Pentateuch, yet unpublished, which is in the library of St. Mark at Venice, and which he supposes to have been made in the twelfth or thirteenth century, by an Hellenist, from the Hebrew of Ezra or of Palestine; and not as the Septuagint, from the Egyptian or Israelitish text. The differences that are found in these versions must not be considered as various readings; since many of these diversities are to be attributed, says De Rossi, to the translators themselves, who have sometimes taken great liberties with the original text, by altering it in their versions. For other particulars, we refer the learned reader to the work itself. The second volume was published at Parma, in 1785, and contains the books of Numbers, Deuteronomy, Joshua, Judges, Samuel, and Kings. The third comprehends Isaiah, Jeremiah, Ezekiel, the twelve lesser prophets, with the Song of Solomon, Ruth, Lamentations, Ecclesiastes, and Esther. And in the fourth, or last, are the Psalms, Proverbs, Job, Daniel, Ezra, Nehemiah, and Chronicles. Parmæ, 1786. The high price of Kennicott's and De Rossi's very valuable works, induced M. Breitkopf to employ Dr. Doederlein and Professor Meissner, to collect the most interesting various readings from the above works, and to print them under the text of his new edition of Reineccius's bible, printed at Leipsic in 1725, and again in 1739, under the title of "Biblia Hebraica, olim a Christiano Reineccio edita, nunc denuo, cum variis lectionibus, ex ingenti codicum copia, a B. Kennicotto & J. B. de Rossi collatorum," Lipsiæ, 8vo. 1793.

Bibles, *Greek*. The most ancient Greek version is the Septuagint: for an account of which, the manner in which it was found, the collation of its MSS., and other circumstances relating to it, see Septuagint; see also Alexandrian, and Vatican. The number of editions of the Bible in Greek is very considerable; but they may be all reduced to three or four principal ones, namely, that of Complutum or Alcala de Henares, that of Venice, that of Rome, and that of Oxford. The first or Complutensian edition was undertaken by the divines of Complutum, under the direction and at the expence of cardinal Ximenes, and finished in 1514, but not allowed by Leo to be published till 1520; nor were the copies of it distributed to the world at large before the year 1522. It was inserted in the Polyglott Bible, usually called the "Complutensian Bible." In this edition the Greek of the LXX. is said to be altered in many places, in order to accommodate it to the Hebrew text, and to the Vulgate. For a more particular account of it, see Complutensian, and Polyglott. It has been reprinted in the Polyglott Bible of Antwerp, called "Biblia Regia," by Arias Montanus, in 1572; in that of the Commelines, commonly called "Vatablus's Bible," in 1599; and in De Jay's Polyglott of Paris, in 1645. See [illegible].

The second Greek Bible is that of Venice, formed from many ancient copies by Andrea Asulanus, and printed by Aldus Manutius in 1518, and hence called the "Aldine edition." This edition approaches nearly to the Roman, and is said to be purer than the Complutensian. Masius says of it, that it is a copy of the simple interpretation of the ancient LXX.; but not pure, nor free from all intermixture of the words of Theodotion. Usher observes, that it sometimes deviates from the LXX. and adopts the readings of Aquila; and that various glosses have crept into it. From this Aldine edition all the German copies have been derived, which generally adopt the words of it, but differ from it in the order of the books, chapters, and some verses. The apocryphal books are printed separately after the rest. This edition was reprinted, with the Complutensian Latin version, in 1520, by And. Cratandrus: and again, in 1550, by Rich. Brylingerus; at Strasburg, in 1526; at Hamburgh, in 1596; at Frankfort, by the Wecheliani, in 1597; and in other places, with some alterations, to bring it nearer to the Hebrew. The most commodious is that of Frankfort, in which are published, from the Complutensian edition, the four last chapters of Exodus, and a great part of the 24th chapter of the Proverbs. There are also added little Scholia, which shew the different interpretations of the old Greek translation. The author of this collection has not annexed his name, but it is commonly ascribed to Francis Junius.

The third Greek Bible is that of Rome, or the Vatican (see Vatican), formed from the Vatican copy by cardinal Caraffa, and other learned persons, who were employed in this work for nine years, by the order and under the auspices of pope Sixtus V. It was printed at Rome in 1587, with the Greek Scholia, collected from the MSS. in the Roman libraries. It was afterwards printed in Latin, with learned and useful notes, by Flaminius Nobilius, at Rome, in 1588. The Greek edition, with the Latin annexed, the distinction of verses, according to the Vulgate, the Greek Scholia, and the Notes of Nobilius, was printed at Paris, in 1628, by J. Morin, priest of the Oratory. In forming this edition, Caraffa made use of several ancient MSS. besides the Vatican, and particularly one procured from the library of Cardinal Bessarion, written in large letters, and another from Magna Græcia, agreeing with the Vatican; and Caraffa professes that it was his design, not to accommodate this edition to the Latin Vulgate, or the Hebrew, but to the ancient LXX. Notwithstanding some few trivial objections, this edition has been extolled for its purity, its freedom from any material corruptions, and its superiority to all other editions. From this all the English editions have been derived. The Greek edition of Rome, or as Grabe says in his Prolegomena, that of Paris, has been printed in the Polyglott Bible of London, in 1657; to which Walton has added, at bottom, the various readings of the Aldine and Complutensian editions, and of the Alexandrian MS., as well as of Marchialanus's and Card. Barberini's. It was printed at London in 1653, in 8vo. with some deviations with regard to the order of the books, the number of the psalms, &c.; at Cambridge, in 2 vols. 12mo., with a preface by the learned Pearson, in 1665; at Amsterdam, with the same preface, in 1683, by Leusden, 8vo.; and at Leipsic, in 1697, 8vo. with the Greek Scholia of the Roman edition, the parallel places and various readings, and a preface by J. Frickius of Ulm. Another Greek Bible was published at Franequer, in 1709, by Lambert Bos, who professes to adhere to the Roman edition of the Vatican copy, and to subjoin at the bottom of the page, besides the Scholia of the Roman edition, all the various readings he could find, together with fragments of the versions of Aquila, Symmachus, and Theodotion. Breitinger, however, observes, that Bos, instead of adhering to the Roman edition, has followed that of Paris by Morinus, or the text in Walton's polyglott. This edition of Bos has been long the common text-book of biblical scholars,

ſcholars, who cannot eaſily purchaſe the Roman edition; although it is far from being a correct copy of its prototype.

The fourth Greek Bible is that done from the Alexandrian MS., begun at Oxford by Dr. Grabe, in 1707. An edition of a ſimilar kind had been undertaken by Patricius Junius, or Patrick Young, who proceeded no farther than the 17th chapter of the book of Numbers, and alſo propoſed by Voſſius, but not undertaken. In Grabe's edition, the Alexandrian manuſcript is not printed ſuch as it is, but ſuch as it was thought it ſhould be; i. e. it is altered wherever there appeared any fault of the copyiſts, or any word inſerted from any particular dialect. This ſome think an excellence, but others a fault; urging, that the manuſcript ſhould have been given abſolutely and entirely of itſelf, and all conjectures, as to the reading, ſhould have been thrown into the notes. For the plan of this work, and the mode of its execution, we refer to the author's Prolegomena. A valuable edition of this work, enriched with various readings from the Vatican copy, and other manuſcripts, and illuſtrated by critical diſſertations, was publiſhed by Joſ. Jac. Breitinger, in 4 vols. 4to. in 1730. Tigur. Helvet. A collection of the MSS. of the moſt ancient Greek verſion of the Septuagint has, within theſe few years paſt, been undertaken by Dr. Holmes, canon of Chriſt-church, Oxford; and the firſt volume was publiſhed at Oxford in 1798, folio; for an account of which, ſee SEPTUAGINT. Walton's Prolegomena. IX. Grabe's Prolegom. Hodii de Bibliorum Textibus originalibus, &c. p. 638, &c. Fabr. Bib. Græc. l. iii. c. xi. § 6. Tom. II. p. 324, &c. See SEPTUAGINT, and TESTAMENT.

BIBLES, *Latin*, how numerous ſoever, may be all reduced to three claſſes; the ancient *Vulgate*, called alſo "the old Italic," or "Vulgar Latin," (ſee ITALIC *Verſion*), tranſlated from the Greek Septuagint, for the uſe of the Latins, ſoon after their converſion to Chriſtianity: which verſion was allowed to be ſuperior to all the reſt, being, as St. Auſtin calls it, "tenacior verborum cum perſpicuitate ſententiæ:" which verſion being corrupted, Jerom, between the years 370 and 380, made a new Latin verſion from the Hexaplar Greek; the *modern Vulgate*, the greateſt part of which is done from the Hebrew text; and the *new Latin tranſlations*, done alſo from the Hebrew text in the ſixteenth century. We have nothing remaining of the *ancient Vulgate*, uſed in the primitive times in the Weſtern churches, but the Pſalms, Wiſdom, and Eccleſiaſtes. Nobilius has endeavoured to retrieve it from the works of the ancient Latin fathers; but it was impoſſible to do it exactly, becauſe moſt of the fathers did not keep cloſe to it in their citations.

As to the *modern Vulgate*, there are numerous editions very different from each other. Cardinal Ximenes has inſerted one in the *Bible* of *Complutum*, corrected and altered in many places. R. Stephens, and the doctors of Louvain, have taken great pains in correcting the modern Vulgate. See VULGATE.

The beſt edition of Stephens's Latin Bible is that of 1540, reprinted in 1545, in which are added, on the margin, the various readings of ſeveral Latin manuſcripts, which he had conſulted. The doctors of Louvain reviſed the modern Vulgate after R. Stephens; and added the various readings of ſeveral Latin manuſcripts. The beſt of the Louvain editions are thoſe, at the end of which are added the critical notes of Francis Lucas of Bruges.

All theſe reformations of the Latin Bible were made before the time of pope Sixtus V. and Clement VIII. ſince which people have not dared to make any alterations, excepting in comments, and ſeparate notes. Sixtus V. who was advanced to the papal ſee in 1585, although the Latin Bible of Gregory XIII. was declared to have been reſtored to its primitive integrity, formed, by the aſſiſtance of learned perſons, another edition; and iſſued a bull in 1589, reſolving and declaring that this was to be deemed, without doubt or controverſy, that which was acknowledged as authentic by the council of Trent, and to be maintained as true, legitimate, authentic, and unqueſtionable; forbidding the alteration, addition, or ſubtraction of the leaſt tittle of it, and declaring ſuch a mutilated edition deſtitute of credit or authority. Nevertheleſs, after the death of Sixtus V. this edition was ſuppreſſed by ſucceeding popes, as inaccurate and imperfect. A new edition was undertaken by pope Gregory XIV. and completed and announced by Clement VIII. in 1592, which, though different from that of Sixtus, and even repugnant to it, is received as authentic, under the name of Sixtus V.; and it is now the ſtandard throughout all the Romiſh churches. That pontiff made two reformations; but it is the firſt of them that is followed. See VULGATE. From this the Bibles of Plantin were done, and from thoſe of Plantin all the reſt; ſo that the common Bibles have none of the after-corrections of the ſame Clement VIII. It is a heavy charge that lies on the editions of pope Clement, viz. that they have ſome new texts added, and many old ones altered, to countenance and confirm what they call the Catholic doctrine; witneſs that celebrated paſſage of St. John, *tres ſunt*, &c. Mr. James, an Engliſh proteſtant, has collected above 2000 articles, ſome of which are indeed of no great conſequence, in which Clement's edition differs from that of Sixtus. Clement has adhered more cloſely to the Hebrew text; and his edition, ſays Dupin, is much more correct than that of Sixtus. He adds, though the vulgar verſion be not altogether free from errors and defects, it muſt nevertheleſs be confeſſed that the council of Trent had ſufficient reaſon to prefer this before all the other Latin verſions, as Theodore Beza, P. Fagius, L. de Dieu, Caſaubon, Grotius, Walton, and ſome other proteſtants, have allowed. This verſion was the moſt ancient of all that were extant at the time of this council; the greater part of it was done by Jerom, a very exact and faithful interpreter. It had been uſed for many ages in the Latin church: it was written in a ſimple and natural ſtyle, and yet occaſionally heightened by noble expreſſions; and upon the whole, ſays Dupin, it was the beſt and moſt perfect verſion.

There is a great number of Latin Bibles of the third claſs, comprehending the verſions from the originals of the ſacred books made within three hundred years. The firſt is that of Sanctus Pagninus, a Dominican, under the patronage of pope Leo X. printed at Lyons, in 4to. in 1528, authoriſed by two letters of pope Adrian VI. and pope Clement VII. prefixed to it, the former dated in 1523, and the latter in 1526, and much eſteemed by the Jews. He employed 25 years in the execution of this work, and finiſhed it before the year 1518. This the author improved in a ſecond edition. In 1542, there was a beautiful edition of the ſame at Lyons, in folio, with *ſcholia*, publiſhed under the name of Michael Villanovanus, i. e. Michael Servetus, author of the *ſcholia*. Thoſe of Zurich have likewiſe publiſhed an edition of Pagninus's Bible in 4to. And R. Stephens reprinted it in folio, with the Vulgate, in 1557, pretending to give it more correct than the former editions. There is alſo another edition in 1586, in four columns, under the name of *Vatablus*: and we find it again in the Hamburgh edition of the Bible in four languages.

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In the number of Latin Bibles is also usually ranked the version of the same Pagninus corrected, or rather rendered literal, by Arias Montanus; which correction being approved of by the doctors of Louvain, &c. was inserted in the Polyglott Bible of Philip II. and since in that of London. The chief aim of Montanus has been to translate the Hebrew words by the same number of Latin ones; so that he has accommodated his whole translation to the most scrupulous rules of grammar, without daily adverting to his latinity; and therefore this version may be considered rather as a grammatical commentary than a true version, and adapted to instruct young beginners in the Hebrew, rather than to be read separately. There have been various editions of this in folio, quarto, and octavo; to which have been added the Hebrew text of the Old Testament, and the Greek of the New. The best of them all is the first, which is in folio, 1571. The translation of Thomas Malvenda, a Spanish Dominican, is more grammatical and barbarous than that of Montanus, and not much esteemed.

Since the Reformation, there have been several Latin versions of the Bible from the original Hebrew by Protestants. The most esteemed are those of Munster, Leo Juda, Castalio, and Tremellius: the three last of which have been reprinted various times. Munster published his version at Basil in 1534, which he afterwards revised; he published a correct edition in 1546. Without rigidly adhering to the grammatical signification of the words, like Pagninus and Montanus, he has given a more free and intelligible version; but by not deviating from the sense of the Hebrew text, he has retained some of its idiotism. He has also availed himself of the commentaries of the best Rabbins. Huetius gives him the character of a translator well versed in the Hebrew language, whose style is very exact and conformable to the original. Castalio's fine Latin pleases most people; but there are some who think it too much affected, and destitute of that noble simplicity and natural grandeur, and of that inexpressible energy of style, belonging to the originals, and some other versions: the best edition of it is that in 1573. Leo Juda's version, altered a little by the divines of Salamanca, was added to the ancient Latin edition, as published by R. Stephens, with notes under the name of "Vatablus's Bible," in 1545. It was printed at Zurich in 1543, and is more elegantly written than Munster's, but sometimes recedes too far from the literal sense. It was condemned by the Parisian divines, but printed, with some alterations, by the Spanish divines of Salamanca. That of Junius and Tremellius is preferred, especially by the Calvinists, and has undergone a great number of editions. It possesses much more of the true natural simplicity. The chief Hebraisms are preserved, and the whole is exactly conformable to the Hebrew text, without the least obscurity or barbarity. Nevertheless, it is not without defects; relative pronouns are introduced, without attention to the Hebrew text, and they are charged with adding some words to express their own sense.

We may add a fourth class of Latin Bibles, comprehending the *Vulgate* edition, corrected from the originals. The Bible of Isidorus Clarius [illegible]: that author, not being contented with restoring the ancient Latin copy, has corrected the translator in a great number of places, which he thought ill rendered, so as to make them conformable to the Hebrew text. Although he corrected above 8000 passages, he has omitted some to avoid giving offence to the catholics, by making too many alterations in the vulgar version. Some protestants have followed the same method, and, among others, Andrew and Luke Osiander, who have each published a new edition of the "Vulgate," corrected from the originals, according to the Hebrew text. They have inserted their emendations in a character different from the text of the vulgar version, instead of throwing them into the margin, and thus they have occasioned some confusion.

Bibles, *Oriental*. At the head of the Oriental versions of the Bible, must be placed the Samaritan, as being the most ancient of all, though neither its age nor author have been yet ascertained, and admitting no more for Scripture but the Pentateuch, or five books of Moses. This translation is made from the Samaritan Hebrew text, which is a little different from the Hebrew text of the Jews. This version has never been printed alone; nor any where but in the Polyglotts of London and Paris. See Pentateuch, and Samaritans.

Bibles, *Chaldee*, are only the glosses or expositions made by the Jews in the time when they spake the Chaldee tongue. These they call by the name of *Targumim*, or *paraphrases*, as not being any strict versions of the Scripture. They have been inserted entire in the large Hebrew Bibles of Venice and Basil; but are read more commodiously in the Polyglott, being there attended with a Latin translation. See *Chaldee* Paraphrase.

Bibles, *Syriac*. There are extant two versions of the Old Testament in the Syriac language; one from the Septuagint, which is ancient, and made probably about the time of Constantine; the other, called *antiqua & simplex*, made from the Hebrew, as some suppose, about the time of the apostles. This version is printed in the Polyglotts of London and Paris.

In the year 1555, Widmanstadius printed the whole New Testament in Syriac, at Vienna, in a beautiful character. After him there were several other editions; and it was inserted in the Bible of Philip II. with a Latin translation. The best edition of the Syriac New Testament is unquestionably that of Leyden, published by Schaaf in 1708, and reprinted, much improved, at Leyden, in 1717. A new Syriac and Arabic Testament was printed at Rome, in 1703, by the Propaganda, for the use of the Maronite Christians in Syria. Gabriel Sionita also published a beautiful Syriac edition of the Psalms, at Paris, in 1525, with a Latin interpretation. See Syriac *Version*.

Bibles, *Arabic*. Although the Christian religion was preached in Arabia, as well as in other countries of the East, at an early period, it never was the established religion of the country, as in Syria and in Egypt; for even the temple of Mecca was a heathen temple till the time of Mahomet. A translation of the Bible into Arabic was therefore wholly unnecessary before the conquests of the Saracens, when the Arabic became the vernacular language of Christian countries. Historical evidence on this subject extends no further than the tenth century, when Rabbi Saadias Gaon published an Arabic version of the Pentateuch; and if conjecture may be allowed (says Marsh, in his edition of Michaelis's Introduction, vol. iii. p. 599.), we may suppose that most of the Arabic versions were made during the period that elapsed between the conquests of the Saracens in the 7th century, and the crusades in the 11th, especially about the middle of this period, when the Syriac and the Coptic, though they had ceased to be living languages, were still understood by men of education; and Arabic literature, under the patronage of Almamon and his successors, arrived at its highest pitch. The age in which the Arabic printed version, or versions of the New Testament, were written, is wholly undecided, for we have no knowledge of the MSS. from which the Roman edition of the four Gospels (mentioned below) was printed; and all that we know of the MSS. used by Gabriel Sionita in his edition of the Paris Polyglott, and by Erpenius in his edition of the Arabic New Testament, is, that the former used a MS. brought from Aleppo, and written in Egypt in the 14th century, and the latter a manu-

ſcript brought from Egypt, in which the goſpels were written in the 13th, and the Acts, Epiſtles, and Revelation in the 14th century. But we are left wholly in the dark with reſpect to the century in which the verſions themſelves were made. The Arabic verſions may be divided into four claſſes; viz. thoſe taken immediately from the Syriac, from the Coptic, from the Greek, and from the Latin. That various Arabic verſions have been made from the Latin in modern times by oriental monks reſiding at Rome, who being inſtructed by the Romiſh clergy to regard the Vulgate as the ſtandard by which all other verſions ſhould be regulated, propoſed eſſentially to ſerve their brethren in the Eaſt, by tranſlating it into their native language, is evident from what is related by profeſſor Adler in his Biblical and Critical Journey to Rome, p. 178; and an Arabic verſion of this kind was actually publiſhed at Rome, in 1752, by Raphael Tuki, biſhop of Arſan. As for thoſe verſions which are written in parallel columns with the Syriac and Coptic, of which copies exiſt in the royal library at Paris, it is reaſonable to ſuppoſe that they were not made from the Greek, but immediately from the ancient verſions with which they are connected, as the means of underſtanding them, after the languages in which they were written had ceaſed to be ſpoken. For the ſame reaſon, thoſe annexed to the Greek text were probably taken immediately from the Greek; but of theſe Greek Arabic MSS. only one has been diſcovered, namely, that in the univerſity library at Leyden. Walton (Prolegomena, p. 96.) ſays, that there are two kinds of Arabic verſions in uſe among the eaſtern Chriſtians; one called the Syriac, and the other the Egyptian, from the countries in which they are uſed. Both theſe verſions, according to Aug. Juſtinian, biſhop of Nebo, were tranſlated from the Greek. In the year 1516, Aug. Juſtinian printed at Genoa an Arabic verſion of the Pſalter, with the Hebrew text and Chaldee paraphraſe, adding Latin interpretations, which, he ſays, were taken from the Syrian or Antiochian verſion. There are alſo Arabic verſions of the whole Scriptures in the Polyglotts of London and Paris, ſaid by Juſtinian to be taken from the Egyptian or Alexandrian verſions; and we have an edition of the Old Teſtament entire, printed at Rome in 1671, by order of the congregation *de propaganda fide*; but it is of little eſteem, as having been altered agreeably to the Vulgate edition. The Arabic Bibles among usare not the ſame with thoſe uſed by the Chriſtians in the Eaſt. Some learned men take the Arabic verſion of the Old Teſtament, printed in the Polyglotts, to be, at leaſt in the main, that of Saadias, who died in the year 942, and who tranſlated the whole Old Teſtament from the Hebrew into the Arabic, expreſſing the Arabic in Hebrew characters. Their reaſon is, that Aben Ezra, a great antagoniſt of Saadias, quotes ſome paſſages of his verſion, which are the ſame with thoſe in the Arabic verſion of the Polyglotts; yet others are of opinion that Saadias's verſion is not extant. For though the whole Hebrew Bible was thus tranſlated by him, the Pentateuch only has been, as yet, publiſhed from his verſion. The other books, now in Arabic, in the Paris and London Polyglotts, were tranſlated at different times by different authors; partly from the Greek, and partly from the Syriac verſions; and few parts, if any, exceepting the Pentateuch, were tranſlated from the Hebrew text. The Arabic verſion is the lateſt of all the ancient verſions of the Old Teſtament; however, that part of it which has been tranſlated from the Hebrew, will aſſiſt in detecting ſome corruptions that have crept into the Hebrew text ſince, and thoſe parts that are made from the ancient verſions will aſſiſt in eſtabliſhing the true readings of thoſe verſions. In 1622, Erpenius printed an Arabic Pentateuch, called alſo the Pentateuch of Mauritania, as being made by the Jews of Barbary, and for their uſe. This verſion is very literal, and eſteemed very exact. The four evangeliſts have alſo been publiſhed in Arabic, without and with a Latin verſion, at Rome, in 1591, folio. The Latin tranſlation is printed under each line of the Arabic text, and is taken from the Vulgate, though the Latin text is in ſome meaſure altered, ſo as to make it correſpond to the Arabic. In a repreſentation of the baptiſm of Chriſt, annexed to it, the rite appears to be performed, not according to the oriental cuſtom of immerſion, but according to the northern practice of aſperſion; for our Saviour is placed, not in Jordan, but at the brink of the river, with his feet only immerſed, while John the Baptiſt, kneeling on a rock, pours water on his head. The MS. from which this editio princeps of the Arabic goſpels is taken, is wholly unknown. Michaelis obſerves, that upon comparing it with the catechiſm of the Druſes, the paſſages there quoted from the goſpels coincide with this edition; whence he infers that this verſion muſt have been long and generally known in Aſia. But from this coincidence no other inference can be juſtly drawn, except that the Arabic verſion of the goſpels, printed at Rome in 1591, was made before the 11th century; for to that age the origin of the Druſes is referred. Erpenius obſerves, in the preface to his Arabic New Teſtament, that this edition bears a great reſemblance to the MS. from which he printed the four goſpels, except the firſt thirteen chapters of St. Matthew. The verſion, ſays Michaelis, was certainly taken from the Greek: but father Simon (Hiſt. Crit. des Verſions du N.T. ch. 18.) ſays, that upon comparing the Arabic verſion of the four goſpels printed at Rome, and afterwards reprinted in the Polyglotts, with an Arabic tranſlation of the Coptic verſion, he found them diſſimilar; but that on comparing it with an Arabic tranſlation of the Syriac verſion, he perceived a great reſemblance. Hence he concluded, that it was taken, not from the Greek, but from the Syriac text. This verſion has been ſince reprinted in the Polyglotts of London and Paris, with ſome little alteration of Gabriel Sionita. This Gabriel Sionita, a Maronite by birth, from the neighbourhood of Libanus, and one of the principal editors of the Paris Polyglott, relates, that he made uſe of a manuſcript written in Egypt in the 14th century; but he ſeems to have been unacquainted both with the name of the author, and with the age in which he lived. Le Long relates, that it was brought immediately from Aleppo to Paris. From this MS. the Arabic verſion of the Acts and of the Epiſtles was taken, which was firſt in the Paris, and reprinted with additions in the London Polyglott. But this verſion of the Acts and Epiſtles can lay no claim to high antiquity; and though it was probably not taken from the Syriac, yet it is not certain whether it was taken from the Greek or the Coptic. Erpenius publiſhed an Arabic New Teſtament entire, as he found it in his manuſcript copy, at Leyden, in 1616, from a manuſcript written in the Upper Egypt, in 1342. From two dates, which Erpenius ſeems to have confounded, it is probable, that the manuſcript uſed by him was a compound of two different manuſcripts, one written in the 13th, and the other in the 14th century; and this is very conſiſtent with the opinion, that the goſpels in this manuſcript were tranſlated either from the Coptic or from the Greek, and the Acts and Epiſtles from the Syriac.

There are ſome other Arabic verſions of late date mentioned by Walton in his Prolegomena; particularly a verſion of the Pſalms preſerved in Sion College, London, and another of the prophets at Oxford; neither of which has been publiſhed.

The Engliſh ſociety for promoting Chriſtian knowledge publiſhed, in 1727, an Arabic New Teſtament, for the uſe of the Chriſtians in Aſia. Ten thouſand copies were printed, but none ſold in Europe, ſo that this edition is very ſcarce.

Two

Two copies are preſerved at Cambridge, one in the univerſity library, and another in the library of St. John's college. The text is taken from the Polyglotts; but the editor Soloman Negri, by order of the ſociety, altered it in thoſe paſſages which vary from the reading of our preſent Greek text. The editor, ſays Michaelis, has taken the liberty of inſerting 1 John v. 7. without cautioning the reader that it was not taken from any MS.

An Arabic Bible is ſaid to have been printed at Bukareſt, in 1700, and the goſpels at Aleppo, in 1706. Of theſe, as well as of the complete editions of the Arabic verſion, a deſcription is given in Le Long's Bibl. Sacr. ed Maſch. P. ii. vol. i. p. 110—137. For an account of the MSS. of the Arabic verſion of the N. T. preſerved in the different libraries of Europe, ſee Boerner's edition of Le Long's Bibl. Sacr. P. i. p. 234—240. or vol. i. p. 120—122. Paris ed. 1723; Uri's Catalogue, N° 22—34 of the Arabic MSS.; and Note 11 to § 3. ch. vii. in Marſh's edition of Michaelis's Introduction to the N. T. In the univerſity library are two Arabic manuſcripts of the goſpels, which formerly belonged to Cyrillus Lucaris.

Bibles, *Coptic*. There are ſeveral manuſcript copies of the Coptic Bible in ſome of the great libraries, eſpecially in the library of Paris. The Coptic verſion of the New Teſtament muſt be regarded as a principal verſion of conſiderable antiquity, becauſe it has given birth to ſeveral others in the Arabic language; for ſince Egypt was invaded by the Saracens, who extirpated the old language, the Egyptians have generally annexed to the Coptic N. T. an Arabic tranſlation, which has almoſt ſuperſeded the original. Niebuhr, in his Deſcription of Arabia (p. 86), relates, that though the goſpels are ſtill read in the Coptic verſion in the public ſervice, it is not underſtood even by the prieſts; and that immediately after the leſſons have been read in Coptic, the ſame are read in Arabic, which is the preſent language both of the Upper and the Lower Egypt. Thomas Marſhall had once intended to print the Coptic verſion, and had even prepared the four goſpels for the preſs, but he died before they were printed. Upon which the publication was reſerved for Dr. D. Wilkins, a native of Memel in Pruſſia, who, after having ſtudied the Coptic, made a journey to Amſterdam with this view; but induced by ſeveral advantageous circumſtances, he removed to Oxford, where his Coptic New Teſtament was printed in 1716, at the expence of the univerſity. Beſides a long preface, he added a Latin tranſlation of the Coptic text, which Jablonſki and La Croze have criticiſed with ſome ſeverity. It is ſaid, however, that Wilkins took great pains to preſent the world with a faithful copy, and that his endeavours were not unſucceſsful. He alſo printed the Pentateuch, with a Latin tranſlation, in 1731. Since his time a great variety of MSS. have been collated; and if Woide had undertaken the taſk, a more complete edition of the Coptic verſion might have been expected. The title of Wilkins's edition is "Novum Teſtamentum Ægyptium vulgo Copticum, ex MSS. Bodleianis deſcripſit, cum Vaticanibus et Pariſienſibus contulit, et in Latinum ſermonem convertit, David Wilkins, Eccleſiæ Anglicanæ Preſbyter," Oxon. 1716, 4to. Maj. Montfaucon, in his Palæographia Græca (l. iv. c. 7. p. 31.), ſays that the Coptic MSS. which remain, are not very ancient, and that he has not ſeen any older than 500 years. Wilkins, in his preface, ſupports the antiquity of the Coptic verſion by ſeveral arguments, the chief of which is drawn from Antonius, who began to lead an aſcetic life about the year 271, and who, though an Egyptian, and ignorant of Greek, read the New Teſtament. To the ſame purpoſe Woide (p. 97. of his Eſſay, mentioned below) maintains, that the Egyptian verſion uſed by Antonius in the third century, was written in Coptic, becauſe he actually read an Egyptian verſion of the Bible, and as he underſtood only the dialect of his own country, he concludes that the Coptic verſion exiſted before the middle of the third century. Ludovicus Pickius, or Louis Picques, who was acquainted with the Coptic language, refers this verſion to the fifth century. See Mill's Prolegomena, § 1509.

The readings of the Coptic have a ſtriking affinity with thoſe of the Latin verſion, and ſometimes with thoſe of the Codex Cantabrigienſis. The ſtory of the adultreſs is found in ſome copies, and omitted in others; but 1 John v. 7. is omitted in all. Wetſtein has alſo obſerved, that the Coptic New Teſtament has a very great ſimilarity to the quotations of Origen, Euſebius, Cyril, and to the Alexandrine manuſcripts. The beſt accounts of the Coptic verſion are given in Simon's Hiſtoire Critique des Verſions du Nouveau Teſtament, ed. 16.; in the Preface to Wilkins's edition of the Coptic New Teſtament; in Le Long's Bibl. Sacr. ed. Maſch. P. ii. vol. i. § 10; and particularly by the learned Woide, in a German eſſay printed in 1778, in vol. iii. of the Kieliſche Beytrage, p. 1—100. See Coptic.

Bibles, *Sahidic*. The Sahidic verſion of the Old and New Teſtament, or that of Upper Egypt, exiſted only till of late in MS.; but in 1778, the learned Woide publiſhed propoſals for an edition of ſeveral fragments of this verſion, comprehending about a third part of the New Teſtament, under the following title, "Fragmenta Novi Teſtamenti juxta interpretationem dialecti ſuperioris Ægypti, quæ Thebaidica ſeu Sahidica appellatur, MSS. Oxonienſibus deſcripta quæ Latiné reddet, et ſimul etiam de antiquitate et variis lectionibus hujus interpretationis differet, C. G. Woide." The learned editor lived to continue the work ſo far as to print the fragments of St. Luke's goſpel, and to prepare for the preſs the manuſcript of the fragments of St. John's goſpel, but he died in May 1780. After his deceaſe, the delegates of the Clarendon preſs entruſted the completion of the work to Dr. Ford; and under his care it made its appearance, entitled "Fragmenta Novi Teſtamenti, e verſione Egyptiacâ Dialecti Thebaidicæ, Sahidicæ, ſeu ſuperioris Egypti," Oxon. large folio. In an elaborate diſſertation prefixed to this work, Dr. Woide treats of the Coptic verſion of the Old Teſtament; of the Sahidic verſion of the Old Teſtament; and of the original texts from which thoſe verſions were made. In his opinion both the verſions were made from the Greek; they expreſs the phraſes of the verſion of the LXX.; and moſt of the additions, omiſſions, and tranſpoſitions, which diſtinguiſh the LXX. from the Hebrew, are diſcoverable in both the Coptic and the Sahidic verſion. In a ſecond ſection the author treats of the Coptic verſion of the New Teſtament, and Wilkins's edition of it; of the Sahidic verſion of the New Teſtament; and of the antiquity of the verſions of the Old and New Teſtament in both dialects. And in a third ſection, Dr. Woide gives an account of the verſions, in both dialects, of the apocryphal books of the Old and New Teſtament. From his obſervations and account, we may conclude, that the Coptic and Sahidic are diſtinct and independent verſions; that the Coptic inclines more to the Alexandrian or Weſtern edition, than the Sahidic; that no remarkable coincidence is to be found between the Coptic or Sahidic verſion and the Vulgate; and that we have no reaſon to ſuſpect the former to have been altered or made to conform to the latter; and that the age of the Sahidic verſion is not yet aſcertained. Dr. Woide ſuppoſes, that it was made in the ſecond century; and in proof of this opinion, he alleges three arguments. The firſt argument, deduced from the uſe made of an Egyptian verſion by St. Anthony, who is ſaid by St. Athanaſius to have been ignorant of the Greek language, and yet to have conſtantly read the Scripture, has been mentioned under the preceding

article. His second argument is deduced from a Sahidic MS. which is probably of the second century, and which contains various passages both of the Old and New Testaments, coinciding with some of the fragments of the Sahidic versions. His third argument is founded on an apparent coincidence of some passages in the fragments, with a manuscript containing two books of the fabrication of the Gnostics, and evidently written in the second century. It appears then, if no objections can be made to these arguments, that proofs may be alleged of a higher antiquity in favour of the Sahidic version than can be produced in favour of any other version of the New Testament; and it must of course be of the greatest importance in the criticism of the Greek Testament. At the same time it must be acknowledged, that the oldest historical evidence for the high antiquity of an Egyptian version is that of Epiphanius and Theodoret; the former quoted by Semler in his "Apparatus ad Novi Testamenti interpretationem," p. 64.; the latter by Wilkins, in the "Prolegomena" to his Coptic New Testament, p. 6. From an examination of the various readings furnished by the above-mentioned fragments, it appears, that the story of the adulteress, John viii. 1—12. is not among them; in the Acts of the Apostles, ch. xx. 28. the Sahidic version coincides with those Greek MSS. which have κυρ.ου, not θεω, in 1 Tim. iii. 16. they coincide with those which read O instead of θεος: and 1 John ch. v. has the sixth and eighth verses; but the seventh, which contains the testimony of the three heavenly witnesses, is absent. We have an account of the Sahidic version of the New Testament in "Friderici Münteri Commentatio de indole versionis N. T. Sahidicæ, &c." Hafniæ, 1789, 4to. to which are annexed some fragments of the New Testament from manuscripts in the possession of cardinal Borgia. Some fragments of the Sahidic version of the gospels of St. Matthew and St. John have been likewise published by Mingarelli in his "Ægyptiorum codicum reliquiæ, Venetiis in bibliotheca Namiana asservatæ," Bonon. 1785, 4to. MSS. or rather fragments of MSS. of the Sahidic version of the New Testament are preserved in the libraries of Rome, Paris, Oxford, Berlin, and Venice.

Bibles, *Ethiopic*. The Ethiopians have also translated the Bible into their language. Chrysostom, cited by Michaelis, says, that the Ethiopians had in his time a version of the Bible; but his evidence is unsatisfactory. Ludolf, in his history of Ethiopia, relates, that the Scripture was translated into that idiom of the Ethiopic language, which was at that time more peculiar to the inhabitants of Tigré, from the Greek version of the LXX, according to a certain copy used in the church of Alexandria, which the innumerable various readings that are inserted in the English Polyglott Bible from one of the same copies, plainly prove. As for the author, and time of the translation, he is unable to ascertain either; but thinks it most probable that it was begun at the time when the Habessines, or Abyssinians, were converted, or soon after, and that it was gradually perfected. Mr. Bruce, in his "Travels," vol. i. p 490, says, that the Abyssinian copy of the Holy Scriptures was, in Mr. Ludolf's opinion, translated by Frumentius, a bishop in the 4th cemtury, who first preached Christianity in Ethiopia; but Ludolf has left the matter undecided. See Hist. of Ethiopia, p. 262 ed. 1682. Mr. Bruce himself inclines to this opinion. They divide the Old Testament, says Ludolf, containing 46 books, into four principal parts, and mix the apocryphal with the canonical. Walton, (Proleg. xv. p. 100.) says, that Gaulmin had an ancient MS. of the whole Ethiopic Old Testament, which was deposited in the royal library of Sweden. Mr. Bruce informs us, (vol. i. p. 489.) that he brought with him a copy of the Ethiopic version of the O. T. which he has deposited in the British Museum: but it does not appear that he brought a copy of any part of the New. Indeed, he says, (vol. i. p. 493.) that copies of the whole N. T. are in that country very scarce; that, except in the churches, he had never seen a single MS. which comprehended all the parts of it; and that even the transcripts of the Gospels were in the hands only of men of the first distinction. The Ethiopic version of the N. T. contains the whole of it, divided, according to Ludolf, into four separate parts, viz. the Gospels, the Acts, the fourteen Epistles of St. Paul, and the seven Catholic Epistles. The Apocalypse is added as an appendix, and entitled "Abukalamsis." Scaliger refers the Ethiopic version to the time of Justinian, at which period he dates the conversion of the Abyssinians: but Walton refers it to a much earlier period, and not far distant from the times of the Apostles. Whoever was the translator of it, it appears to have been taken immediately from the Greek: from the frequent confusion of words which found alike in the Greek, but which have not been confounded by any other translator, and from its agreement in many of its readings with the Alexandrine MS. and with the quotations of Origen. Neither of these circumstances can appear extraordinary, as it was natural for the inhabitants of Abyssinia to procure their copies of the Greek Testament from Egypt. The translation of the Gospels is much superior to that of the Epistles. This version was first published at Rome, in 1548 and 1549, under the pontificate of Paul III. but the editors, who were natives of Ethiopia, had a very imperfect MS. of the Acts, the chasms of which they were obliged to supply from the Vulgate. To this purpose, Ludolf observes, that the Acts of the Apostles, for the most part, were translated at Rome, out of the Latin and Greek, for want of the Ethiopic original. This original seems to have been the source from which our editions of the Ethiopic version of the N. T. have flowed; and it is probably preserved in the Vatican, though it has not yet been described. Walton reprinted this Roman edition in the London Polyglott; but his copy, being in some places illegible, the editors filled up the deficiencies according to their own judgment, so that the Roman edition retains the same value, as if no other were extant. The Latin translation was made by Dudley Loftus, and corrected by Castell; but it is of little worth, and has led Mill, and other collectors of various readings, into error. A more accurate Latin translation of the Ethiopic version has been published by professor Bode, under the following title, "Novum Testamentum ex versione Ethiopici interpretis in Bibliis polyglottis Anglicanis editum ex Ethiopicâ lingua in Latinum translatum," Brunsvigiæ. 1752, 1755. 2 toms. 4to. The best extracts from the Ethiopic version, says Michaelis, are and must be uncertain, because we have no accurate impression of the version itself; however, his editor (Dr. Marsh) observes, that if the Ethiopic version was made immediately from the Greek, and in an early age; if its readings coincide with the quotations of Origen, and the Greek MSS. of the Alexandrine edition, it seems to be entitled to the same privileges, as other versions of equal antiquity. The principal objection applies not so much to the version itself, as to our printed text, which is probably incorrect, as not being the result of a collation of different MSS. But the same objection may be made to the old Syriac version, in which, though various MSS. have been used since the original edition of Widmanstad, the alterations that have been made deserve rather the name of corruptions than of improvements. Of all the books of the O. T. there never was any printed, but the Psalms and the Song of Solomon, in the Ethiopic language at Rome, in 1513; at Cologn, in 1518, and since that time, with

with corrections and emendations, by Walton, in the London Polyglott.

Bibles, *Armenian*. There is a very ancient Armenian version of the whole Bible, done from the Greek of the LXX. by some of their doctors, about the time of St. Chrysostom. See Armenian *version*. The first printed edition of the Armenian version was published in the 17th century by Uscan, bishop of Erivan; because the Bible was at that time become so scarce in Armenia, that a single copy cost 1200 livres. Hence a council of Armenian bishops assembled in 1662, ordered the Bible to be printed in Europe. Accordingly, three distinct editions were printed at Amsterdam; the first in 1666, containing both the O. and N. T. in 4to. a second, in 1668, including only the N. T. in 8vo., and a third, in 1698, in 12mo. The two first were printed under the direction of Uscan; but the last is the most beautiful edition. A complete description, particularly of the first of these editions, is given in Le Long. Bib. sacra, ed. Masch. P. II. vol. i. p. 173—176. 180. A list of Armenian MSS. of the N. T. is given in Dr. Boerner's edition of this work, P. i. p. 280, or vol. i. p. 138, of the Paris edition of 1723; see also vol. i. p. 76, of the Catalogus MSS. Bib. Regiæ, and note 11 to § 3. chap. vii. of Marsh's Michaelis. La Croze and G. Whiston have accused the editor of the above-mentioned edition of having corrupted, in some places, the Armenian text. It is certain, however, says Michaelis, that 1 John v. 7. was not in his MS.; for Sandius declares, that he had seen the MS. from which the Amsterdam edition was printed, and that it wanted that verse. Sandius, in the place referred to by Michaelis, speaks of one ancient MS. which he had seen, in possession of the bishop of the Armenian church, and which had been collated at Amsterdam, in which this passage did not occur. It is possible, however, and even probable, that Uscan had more than one MS. and the words of Sandius do not imply the contrary. Nevertheless, we have positive evidence, that Armenian MSS. written before the time of the council at Cis, in 1307, have not this verse. In like manner, John v. 4. is wanting in the Armenian MS. but inserted in Uscan's edition; and La Croze observes, that Uscan himself acknowledges, in his preface, that he had altered some passages from the Vulgate; not, as he candidly allows, with an intention to deceive, but from ignorance and superstition.

Bible, *Georgian*. The Georgian version was first printed at Moscow, in 1743, fol. and a description of it is given by the learned Eichorn, in his "Allgemeine Bibliothek," or Universal History of Biblical Literature, vol. i. p. 153—169. From the description it appears, that the Georgian text was altered from the Slavonian, in the edition of Moscow, and it would therefore be of little value in the criticism of the N. T. Two MSS. of the Georgian version of the Gospels are preserved in the Vatican. See Le Long. Bib. Sacr. tom. i. p. 140. ed. Paris, 1723.

Bibles, *Persian*. Some of the Fathers seem to say, that all the Scripture was formerly translated into the language of the Persians; but we have nothing now remaining of the ancient version, which was, certainly, done from the Septuagint. The Persian Pentateuch, printed in the London Polyglott is, without doubt, the work of Rabbi Jacob, a Persian Jew, surnamed Tavosus, Tavusius, or Tusius, from the city Tus, where the Jews had a famous academy. It was translated from the Hebrew text, for the use of the Jews, who lived in Persia, and printed in the Hebrew character, with the Hebrew text, and with the version of Onkelos and Saadias, at Constantinople, in 1551. From the collation of this, with other versions, we may deduce a satisfactory explanation of the famous prophecy of Jacob concerning the advent of the Messiah, unperverted by the glosses of the Rabbins. We have likewise two Persic versions of the four Gospels, of which the most ancient, and that which is of course the most valued by the learned, is printed in the London Polyglott, accompanied with a Latin translation by Dr. Sam. Clarke, and notes by Dr. Thomas Greaves, contained in the appendix. This Persic version of the four Gospels, which is the only part of the N. T. hitherto printed, was taken from a MS. in the possession of Dr. Pococke, and written in the year 1341, as appears by a declaration annexed to it. A new Latin translation has been published by professor Bode, at Helmstadt, in 1750, 1751, with a preface containing historical and critical remarks on the Persic version. Dr. Greaves has very justly observed, that the Persic is a translation of the Syriac, for it sometimes retains even Syriac words, and subjoins a Persic interpretation; and in other places confounds the meaning of words, that have a similar sound only in the Syriac. This is likewise probable in itself; for the Christians, who lived scattered in the Persian empire, made use of Syriac as the language of the church, and as the language of literature; and it was common for the Persians to study in the schools of Syria, especially at Edessa. The principal use then of the Persic version is in discovering the false readings that have crept, since that period, into the Syriac. It might be added, that the Persic omits passages, that are wanting in no MS. or version except the Syriac; as Matth. xxvii. 46. Mark. vii. 34. There is another Persic version of the Gospels, which Abraham Wheeloc began to print in 1652, and which was finished after his death by Pierson, in 1657. It was published in London, and three MSS. were used by the editors. Walton, in his "Prolegomena," xvi. 9. p. 102, informs us, that he knew of only three MSS. of the Persic Gospels, one in the possession of Dr. Pococke, which he used, and the other two in the libraries of Oxford and Cambridge, different from the other, and less ancient. If this be the case, Wheeloc must have used MSS. containing distinct versions, and his text must be of a mixed nature, and of less value in that respect, as well as in point of antiquity, than that of the Polyglott. Wheeloc, or rather Pierson, whose name is prefixed to the second title page, was of opinion, that this Persic version was made from the Greek; but Renaudot believed it to have been taken from the Syriac. Walton mentions two Persian versions of the Psalms, that were made in the 17th century from the vulgar Latin.

Bibles, *Gothic*. It is generally said, that Ulphilas, a Gothic bishop, who lived in the fourth century, made a version of the whole Bible, for the use of his countrymen. Philostorgius (Hist. Eccles. l. ii. c. 5.) asserts, that Ulphilas omitted the book of Kings, from an apprehension, that the martial spirit of his nation might be roused by the relation of the Jewish wars; yet this opinion has been confuted by Knittel, in his learned commentary, § 255. Michaelis, who was once a strenuous advocate for the opinion, that this was a Frankish version, has since changed his mind, and in the last edition of his Int. to N.T. vol. ii. p. 130. ed. Marsh, expresses his conviction that it was Gothic. For an account of the author, see Ulphilas; and to the account already given of this version under the article Argentius *Codex*, we shall here subjoin the following particulars. From the martyrology of Nicetas, preserved by Simeon Metaphrastes, it appears, that this version was made immediately from the Greek. Besides, independently of this evidence, it is natural to conclude, that a native Cappadocian, who was bishop of a nation in the neighbourhood of Constantinople, and was sent ambassador to the Greek emperor, would translate from the original Greek, with which he was much bet-

ter acquainted than with the Latin verſion, from which ſome writers have erroneouſly ſuppoſed his verſion was taken. Moreover, from a paſſage quoted by Blanchini in the "Prolegomena," to the firſt volume of his "Evangeliarium quadruplex," p. 8. from a MS. preſerved at Breſcia, containing the old Latin verſion of the Goſpels, we may infer, that the Gothic verſion was known in Italy, and that a diſtinction was made between it and the Italian. Of this important verſion we have few remains. The principal of theſe are contained in the *Codex* ARGENTEUS; which has the four Goſpels, though not without conſiderable chaſms. It was firſt printed in Gothic letters, at Dort, in 1665, 4to.; and reprinted at Amſterdam, in 1684, (Michaelis); and another edition was printed in Latin letters, at Stockholm, accompanied with the Iſlandiſh, Swediſh, and Latin vulgate. In 1750, it was printed at Oxford, by Lye, after the corrections and emendations of archbiſhop Benzel; and in 1752 and 1755, the learned Ihre publiſhed two ſmall eſſays, under the title of "Ulphilas illuſtratus," in which the erroneous paſſages of the former editions are correctly printed in Latin letters, accompanied with a Latin tranſlation, and notes.

BIBLES, *Muſcovite, Ruſſian*, or *Slavonian*. The Ruſſian or Slavonian verſion was taken from the Greek by two brothers, Methodius and Cyril, natives of Theſſalonica, and apoſtles of the Slavonians, who lived in the 9th century. According to the account given by Poletika, a learned perſon of Ruſſia, and formerly Greek tranſlator to the holy ſynod, in anſwer to inquiries propoſed by Michaelis, it appears, that the holy ſynod ordered a complete copy of the Bible to be taken, in 1499, which is preſerved in the library of that Synod; but from the ſame teſtimony it appears, that MSS. of the New Teſtament are extant from the 11th to the 14th century, ſome on vellum, others on paper, which are alſo preſerved at Moſcow, in the library of the holy ſynod. The oldeſt known edition is that of Prague, publiſhed by Francis Scorina, in 1519; but Poletika is not certain whether it contains the Bible complete. It was reviſed in 1570, altered in ſeveral paſſages from an ancient MS. written in the time of the grand duke Wladimir, given to Garabunda, ſecretary to the duchy of Lithuania, and uſed in the edition of the Bible, printed at Oſtrog, in 1581, at the expence of Con. Baſil, duke of Oſtrog, for the common ſervice of all Chriſtians who ſpoke the Slavonic language. Other editions were printed at Moſcow, in 1663, 1751, 1756, 1757, and 1766, in folio, in 1759 in large 8vo. and in 1783, in 4to. It was alſo printed at Kiow, in 1758, folio; and at Supraſl in Poland, in ſmall folio. A copy of the edition of 1581, and another of that of 1663, both which are ſcarce, are preſerved in the univerſity library of Gottingen. A particular edition of the Acts of the Apoſtles, and the Epiſtles, was printed in 1653. The paſſage 1 John v. 7. is found neither in the Oſtrog edition, the ancient MSS. nor in thoſe editions of the Acts and Epiſtles, which are prior to 1653. That of 1653 contains it; that of 1663 has it in the margin, and that of 1751, and other modern editions, in the text. Poletika thinks this interpolation was made in the time of the patriarch Nicon, in 1653, when an edition was publiſhed of the Acts and Epiſtles. A very excellent deſcription of the Slavonian verſion has been communicated to the public by Dobrowſky, a very learned critic in the "Neue Orientaliſche Bibliothek," vol. vii. p. 153—167. From this work the following particulars, relating to this verſion, are extracted, by Marſh, in his edition of Michaelis' notes to ch. vii. § 37. The Slavonian verſion is very literally tranſlated from the Greek, the Greek conſtruction being frequently retained where it is contrary to the genius of the Slavonian; and reſembles, in general, the moſt ancient MSS. In the Goſpels it agrees with the Codex Stephani n more frequently than with any other Greek MS. In the catholic epiſtles it agrees, in general, with the Codex Alexandrinus, and frequently in the Revelation. In the Acts and in the Epiſtles of St. Paul, it agrees, in general, with the moſt ancient MSS. but ſometimes with one, ſometimes with another, yet moſt frequently with Wetſtein's Codex E. Of the readings adopted by Grieſbach in the text of his Greek Teſtament, the Slavonian verſion has at leaſt three-fourths. Where the united evidence of ancient MSS. is againſt the common printed reading, the Slavonian verſion agrees with the ancient MSS. It has not been altered from the Vulgate, as ſome have ſuppoſed, though the fact is in itſelf almoſt incredible. It varies from the text of Theophylact, in as many inſtances as they agree; and their coincidence is to be aſcribed, not to an alteration from Theophylact, but to the circumſtance, that both Theophylact and the authors of the Slavonian verſion uſed the Greek edition. The Slavonian verſion has few or no readings peculiar to itſelf, or what the critics call "lectiones ſingulares."

BIBLES, *Spaniſh*. There are two tranſlations of the Bible into this language; one done by the Jews, from the Hebrew, and firſt printed at Ferrara, in 1553, and at Amſterdam, in 1661; the other by Caſſiodore Reyna, printed at Baſil, in 1569. A corrected edition of it was printed at Amſterdam, in 1602, and at Frankfort, in 1622. This tranſlation was made from the Hebrew, or rather from the verſion of Pagninus, and the New Teſtament from the Greek. There is a tranſlation of the N.T. in Spaniſh done by Francis Enzinas, and dedicated to Charles V. of which there are ſeveral editions; and another different Spaniſh tranſlation of the N.T. printed in 1596.

BIBLES, *Italian*. There are four Italian verſions: the firſt towards the cloſe of the 13th century, by James de Voragine, archbiſhop of Genoa, who tranſlated the whole Bible into Italian, from the Vulgate; which ancient verſion is quite loſt; the ſecond by Brucciolus, in 1530, who tranſlated the Bible from the Hebrew, or rather from the verſion of Pagninus, and dedicated it to Francis I. king of France; the third by Malhermi, a Venetian and Benedictine monk, abbot of St. Michael de Lemo, tranſlated from the vulgar Latin towards the end of the 15th century; the firſt edition of which was publiſhed in 1471; one of them, in 1477, reviſed by friar Martin, a Dominican; and afterwards printed at Venice in 1541; and the 4th by Diodati, a Proteſtant, which is much eſteemed, and has been often printed. This edition, which was conformable to the French edition of Geneva, was firſt publiſhed in 1607, and again a ſecond time in 1641. The New Teſtament was tranſlated by father Zachary, a Dominican friar of Florence, and printed apart at Venice, in 1542. An Italian edition of the Epiſtles and Goſpels was printed in 1583.

BIBLES, *French*. The moſt ancient tranſlation of the Bible into French is that of Guiars de Moulins, a canon of St. Peter d'Aire, in the dioceſe of Touraine, who was employed in tranſlating the hiſtorical books of the O. and N. T. from the year 1291 till 1294. Of this tranſlation there are ſeveral editions in the Paris library. Some hiſtorians affirm, that Charles V. king of France, cauſed the Bible to be tranſlated into French by Nicholas Oreſme, ſuperior of the houſe of Navarre, and doctor of Paris. Theſe, and ſome other tranſlations of parts of the Bible, are extant in MS. in the Paris library. The firſt French Bible was printed by order of Charles VIII. and dedicated to him, and conſequently before the year 1498; being the tranſlation of Guiars de Moulins. The New Teſtament was printed in French by Colins, printer of Paris, in 1523. But the

the first edition of the whole Bible, translated from the vulgar text into French, was printed, in 1550, at Antwerp, by Martin Lempereur, with privilege from Charles V. The first edition of this Bible, in 1530, is in the Paris library; and the second, in 1534, which is larger, is extant in the libraries of St. Germain des Prez, and of St. Genevieve. These two editions precede that of Robert Olivetan, the first published by the Protestants, in 1535. The translation above-mentioned was printed the third time at Antwerp, in 1540, and is preserved in the Jesuits' library of the college of Lewis le Grand. This translation was revised by the divines of Louvain, and was the foundation of all the French Bibles, since published either by the Catholics or Protestants. The first is that of Robert Olivetan, a kinsman of Calvin, who has copied the Antwerp translation, and merely corrected such passages as differed from the Hebrew text. A new edition was given by Calvin, which comes nearer to the vulgar Latin; and of this Bible many editions were published between the years 1550 and 1561. In 1560 was published a new edition of the Bible, revised by Theodore Beza. In the following year another French translation of the Bible, from the Italian version of Diodati, was published, and held for some time in estimation by the Calvinists. In 1588, the Geneva translation was again corrected, and rendered more conformable to the Hebrew and Greek text. This was revised by Messrs. Desmarets, ministers of Groningen, and printed with notes at Amsterdam, in 1669. In the year 1555, Sebastian Castalio published another French translation of the Bible from the Latin, the style of which is affected and obscure.

A reformation of the French Geneva Bible, by Renatus Benedict, professor of divinity in the college of Navarre, was published in 1566. This was condemned by a brief of Gregory XIII. in 1575. A new edition was undertaken some time after, altogether conformable to the Latin, and free from the errors of the Calvinists, by the doctors of Louvain, who followed the old Antwerp translation, and that of Olivetan, which they corrected: which was printed by privilege from the king of Spain, and under the sanction of the license of the press at Antwerp, in 1578; at Lyons, in 1585; and in several other places. The subsequent Bibles were for some time copies of the Louvain edition, with some corrections; such were that of Peter Besse, printed at Paris, in 1608, and that of Peter Frison, printed at Paris, in 1620. Corbin's Bible, printed in 1641, and approved by the doctors of Poictiers, recedes more than the rest from the Bible of Louvain, and adheres more closely to the literal sense of the text of the vulgar Latin. A new edition of the version of the doctors of Louvain, revised and corrected agreeably to the text of the ancient Vulgate, was published by father Veron, in 1647, and dedicated to the clergy of France. The translation of Abbot de Marolles, is done from the Greek text, or rather from the version of Erasmus, and was first published in 1649, again in 1653, and a third time in 1655. The edition of the N. T. called the edition of Mons, was published in 1667, under the name of Jasper Migeot, printer at Mons. Father Amelot's translation of the N.T. was first printed at Paris, in 1666. Godeau's translation was printed at Paris, in 1668. The whole Bible was also translated by Isaac de Maitre, of Sacy, from the Vulgate, and partly published in his life, and afterwards continued by Peter Thomas, lord of Fosse. Du Quesnel's translation of the N. T. differs little from that of Mons, otherwise than by being more conformable to the vulgar Latin. Father Bonhours has also published a translation of the N.T. and many others have in later times translated either the whole or various parts of the Bible.

Bibles, *German*. Luther's translation of the Bible into German, was done with the assistance of Melancthon, and others of his disciples, the Old Testament from the Hebrew, and the New from the Greek, in 1524, and the publication of it, in several succeeding editions, very much contributed to the progress of the reformation. This was soon followed by a German translation by Jerom Emser, a Catholic, who in his notes criticises that of Luther; and by another translation, done by John of Dietenbergh, from the vulgar Latin, in opposition to that of Luther. Luther's edition, reformed by the Zuinglians and Calvinists, in various editions, was published at Newstad in 1558, and at Herborn in 1595, to the dissatisfaction of the Lutherans. The German translation of Paul Eber, a Lutheran, was printed at Wittenberg in 1564; and German translations were also printed by Leon Juda, and John Piscator, both Calvinists. A new translation in German, by Jasper Ulenberg, a Catholic, not to mention many others, was printed at Cologn in 1630, and was much used in Germany.

Bibles, *Flemish*. The Catholics in the Netherlands had several Flemish translations of the Bible in the 16th century. One was printed in 1548, which was translated by Nicholas Van Winghe, who says that he followed a Flemish translation printed in Holland 70 years before, i. e. long before the reformation. This Bible was revised by the doctors of Louvain, and printed afterwards at Antwerp in 1599, and often since. The Protestants in the Low Countries had for a long time only a translation made after the German Bible of Luther, till in pursuance of an order issued by the synod of Dort, in 1618, they had a new translation printed in 1637, exactly conformable to the Hebrew text of the Old, and the Greek of the New Testament. The Arminians, dissatisfied with this, made another Dutch translation from the Greek, which was printed at Amsterdam in 1680.

The northern nations, who embraced the doctrines of Luther, have no other translations of the Bible besides those done in the vulgar tongue after the German of Luther. The Swedish translation was made by Laurence Petri, archbishop of Upsal, a disciple of Luther, and printed at Stockholm in 1646. The Danes have also one in their language, published first in 1524, and since revised and reprinted in 1633. There is also a translation of the Bible in the Iceland tongue, which some pretend to be the ancient language of the Norwegians or Goths: and another Finland translation in 1648. The Laplanders have also the Psalms, and some other books of the Bible, translated into their own language. In the Polish language, the Socinians have a Bible printed in 1563, and they have likewise a Polish Bible in Lithuania, printed in 1652, done from the Greek and Hebrew by Simon Budni. Sands also mentions a translation of the New Testament by Martin Czechovius, a Socinian, printed with notes in 1577. Pope Gregory XIII. employed the Jesuit Vicki to make a new translation of the Bible in the Polish language, which was printed at Cracow in 1599, with the approbation of Clement VIII. The Bohemians have a Bible in their language, with notes, printed in Germany from 1579 till 1601. The Hungarians have a translation done by George Caldi, a Jesuit, and printed at Vienna in 1626. They have also another more ancient, printed at Frankfort in 1608, and at Oppenheim in 1612.

Bibles, *Indian*. A translation of the Bible into the North American Indian language, by Elliott, was published in 4to. at Cambridge, in 1685.

Bibles, *Saxon*. After the Saxon inhabitants of this country were converted to Christianity, we have reason to believe that they soon had the whole Bible in the characters of their own country, and that the four Gospels in the same

ſame language were read in their religious aſſemblies. The whole ſcripture is ſaid by ſome to have been tranſlated into the Anglo-Saxon by Bede, about the year 701; though others contend that he only tranſlated the Goſpels; and others aſcribe to him only the goſpel of St. John.

We have certain books, or parts of the Bible, by ſeveral other tranſlators; as, 1. The Pſalms, by Adelm, biſhop of Shireborn, contemporary with Bede, about the year 706; though by others this verſion is attributed to king Alfred, who lived near two hundred years after, and who is ſaid by Mr. Fox to have tranſlated both the Old and New Teſtament into his native language; and by others to have tranſlated the greateſt part of the New Teſtament: but the authority on which theſe aſſertions is founded is too precarious to claim any great degree of confidence. On equally uncertain authority it has been ſaid, that the whole Bible was tranſlated into the Saxon language in the reign of Athelſtan. Bale, however, "Script. Brit." cent. 2. c. 27, cites the teſtimony of Malmeſbury to this purpoſe; and archbiſhop Uſher refers this to the year 930. Some books of the Bible were tranſlated by Eadfried, or Egbert, biſhop of Lindisfarne, about the year 680, according to the conjecture of Mr. Selden. A celebrated verſion of the four Goſpels in the Saxon language, ſaid to be made by one Aldred, a prieſt, is reported to have been found in the celebrated code of biſhop Eadfried. Adelm is ſaid to have written a letter to Eadfried, extant in "Wharton's Auctarium Hiſt. Dogm. Uſſerii," p. 351; in which he exhorts him, for the common benefit and uſe of all people, to put the ſcriptures into the vulgar language, which Butler, in his book againſt the vulgar tranſlation, ſays he did. And archbiſhop Uſher, in his "Hiſt. Dogm." c. 5. informs us, that the Saxon tranſlation of the Evangeliſts, done by Eadfried, without diſtribution of chapters, was in the poſſeſſion of Mr. Rob. Bowyer. In the Cotton library is a book of the four Goſpels, ſaid by Wharton, in his "Anglia Sacra," part. i. p. 695, to be written by biſhop Eadfried himſelf, and which had been adorned with pictures, gold, and jewels, by Ethelwoldf, biſhop of Wincheſter. Eadfried, or Egbert, died in 721. But ſome have doubted the exiſtence of ſuch an Anglo-Saxon MS. A verſion of the Pſalms in Anglo-Saxon was publiſhed by Spelman in 1640. 2. The Evangeliſts, ſtill extant, done from the ancient Vulgate, before it was reviſed by St. Jerom, by an author unknown, and publiſhed by Matth. Parker in 1571. This was printed from a MS. now in the Bodleian library, under the direction of archbiſhop Parker, by John Fox the martyrologiſt, with the following title, "the Goſpels of the fowre Evangeliſts, tranſlated in the olde Saxons' tyme out of the Latin into the vulgare toung of the Saxons, and now publiſhed for teſtimonie of the ſame;" at London, by John Daye, 1571. This edition has a preface by John Fox, and is dedicated to queen Elizabeth. Another edition of this verſion was publiſhed at Dort in 1665, by Dr. Thomas Marſhall, who tells us that he could aſcertain neither its author nor age. An old Saxon verſion of ſeveral books of the Bible, was made by Elfric, abbot of Malmeſbury, and afterwards, viz. in 995, archbiſhop of Canterbury; ſeveral fragments of it were publiſhed by Will. Lilly, or W. L'Iſle, in 1638, the genuine copy by Edm. Thwaites, in 1699, at Oxford.

Wm. L'Iſle obſerves, on occaſion of this publication, that if that good ordinance firſt enacted by God, Deut. x. 5. for the preſervation of the book of the law, by keeping a copy of it in the ark, had been continued, and ſtandard Bibles had been preſerved in our cathedral churches, as it has been ſince appointed by king Alfred, we might now have ſhewed the whole book of God, or the entire Old and New Teſtament in Saxon, which was the Engliſh of thoſe times, tranſlated both by that king, and the archbiſhop of Canterbury, Elfric. Elfric tranſlated the Pentateuch, Joſhua, Judges, Ruth, four books of Samuel, entitled in Latin, liber regum, a fifth book called Verba Dierum, or Chronicles, the Pſalter, three books of Solomon, viz. Proverbs, Eccleſiaſtes, the chief of all ſongs, the books of Wiſdom and Eccleſiaſticus, the prophets Iſaiah, Jeremiah, Ezekiel, Daniel, the twelve Prophets, Ezra, Job, Tobias, Eſther, Judith, and Maccabées. Hence we may conclude, with little doubt, that the books of the New Teſtament were before tranſlated into Saxon, and commonly read in that language. The Pentateuch, Joſhua, and Judges, of Elfric's tranſlation, are preſerved, ſays Uſher, in Cotton's library; where is alſo a Pſalter, with ſeveral hymns of the Old and New Teſtament, with the Apoſtles' and Athanaſian creed, with an Engliſh interlineary tranſlation. The book appears, by a note at the end of it, to have been written in the year 1049. The Anglo-Saxon verſion, above-mentioned, is divided into ſections, over each of which is placed a rubric, directing when it ſhould be read; and this circumſtance ſhews, that at this time the Holy Scriptures were read in the public ſervice of the church in a language which the people underſtood. Various readings from this verſion of the four Goſpels were firſt quoted by Mill (Proleg. § 1462.), who took them from the papers of Marſhall. With reſpect to its antiquity, the learned are not agreed: ſome have referred it to the ſixth or ſeventh century, ſince Bede died A. D. 735, but others, more generally, to ſome part of the eighth century. For an account of the MSS. of the Anglo-Saxon verſion, ſee Le Long. Bibl. Sacr. tom. i. p. 422, 423. ed. 1723; and for a complete catalogue of Anglo-Saxon MSS. in general, Wanley's Appendix to Hickes's Theſaurus, publiſhed at Oxford in 1705, folio. Lewis's Hiſt. Eng. Tranſl. of the Bible, p. 5. &c.

Bibles, *Engliſh*. The firſt Engliſh Bible we read of was that tranſlated by J. Wickliffe, about the year 1370, according to ſome, and 1380, according to others: but never printed, though there are MS. copies of it in ſeveral public and private libraries. The MS. of the Old Teſtament ending with the ſecond book of the Maccabees, in St. John's college Oxford, is ſaid to have been written by Wickliffe himſelf. This circumſtance, though expreſſed on the top of the leaf before Geneſis, is very doubtful. This tranſlation was made from the Latin Bibles then in common uſe, not becauſe Wickliffe thought the Latin to be the original, or of the ſame authority with the Hebrew and Greek text, but becauſe he did not underſtand thoſe languages well enough, to tranſlate from them. He likewiſe choſe to tranſlate word for word, as had been before done in the Anglo-Saxon tranſlation, without obſerving the idioms of the ſeveral languages, ſo that this tranſlation is in ſome places not very intelligible to thoſe who do not underſtand Latin. Before the invention of printing, tranſcripts were obtained with difficulty, and copies were ſo rare, that the price of one of Wickliffe's Engliſh New Teſtaments appears, from the regiſtry of William Alnewick, biſhop of Norwich, in 1429, to have been four marks and forty pence, or 2l. 16s. 8d. This tranſlation gave ſuch offence, that a bill was brought into the houſe of lords, 13 Ric. II. A. D. 1390, for ſuppreſſing it. But by the oppoſition of the duke of Lancaſter, the king's uncle, the bill was thrown out of the houſe. Wickliffe's followers were encouraged, by this favourable circumſtance, to reviſe the tranſlation of their maſter, or rather to make another not ſo ſtrict and verbal, but more free and accommodated to the ſenſe. The MS. copies of this tranſlation are more rare than thoſe of the other; but they are found in the Bodleian library, and in other libraries both of Oxford and Cambridge. J. de Treviſa, vicar of Berkley in Glouceſterſhire, who died

about the year 1398, is also said to have translated the whole Bible; but if this be true, it does not appear that any copies of his translation are now remaining. It is probable, that Trevisa merely translated certain sentences of the Bible, that occur in his writings, and some of which are said to have been painted upon the walls of the chapel in Berkley castle. Another English translation has been erroneously ascribed to Reginald Peacock, bishop of Chichester, A.D. 1450, in consequence of his having translated some passages of Scripture, cited in his works. Rolle, an hermit of Hampole in Yorkshire, who translated the Psalms about the year 1340, is supposed by Weever, in his "Funeral Monuments," p. 151, to have been the translator of the New Testament, which translation was in reality Wickliffe's. Richard Fitz-Ralph, archbishop of Armagh, is said to have translated the Bible into Irish. He died in 1360. Dr. James, relying on a vague declaration of sir Thomas More, in his account of the constitutions of Arundel, asserts, that the Bible hath been twice translated into English; and that one of these translations is much more ancient (some hundred years) than Wickliffe's. But Lewis has shewn this to be a mistake. (Hist. Eng. Transl. p. 43.) The zealots of those times were alarmed by these English translations; and in order to prevent their increase, they urged the necessity of restoring the use of Latin Bibles; and to this purpose Chaucer represents the religious as collecting and depositing them in their libraries, and thus withdrawing them from secular priests and curates, and thus hindering them from preaching the gospel to the people. In 1357, when some secular priests were sent from the diocese of Armagh in Ireland, to study divinity at Oxford, they were obliged soon to return, because they were not able to purchase a Bible. Æneas Sylvius, afterwards pope Pius II. observed in 1458, concerning the Italian priests, that they did not seem to have ever so much as read the New Testament; and Robert Stephens, speaking of the Sorbonists, says, that when they are asked in what place of the New Testament any thing was written, they replied, that they had read it in Jerom, or in the Decrees, but what the New Testament was they did not know. (See Hody de Bibl. Textibus, p. 464.) Indeed, at that time, if copies of the Bible had been more frequent, the clergy were generally so ignorant as not to be able to read or understand Latin. The Latin Bibles were not only scarce, but much corrupted by the carelessness of transcribers, and the interference of presumptuous critics. In 1457, Wickliffe's followers were become so numerous, and copies of his English translation of the New Testament so common, that an English Bible was sold for 20s., whereas the price of a portuise, or breviary, was 6 marks. After the art of printing was introduced into England, Latin, Hebrew, and Greek Bibles, and particularly copies of the New Testament, became much more common; and accordingly a vicar of Croydon in Surry, is said to have expressed himself to this purpose, in a sermon preached at Paul's cross about this time: "We must root out printing, or printing will root out us."

Bible, *Tindal's*. For the first printed English translation of the Scriptures we are indebted to William Tindal, who, having formed a design of translating the New Testament from the original Greek into English, removed to Antwerp in Flanders, for this purpose. Here, with the assistance of the learned John Fry, or Fryth, burnt for heresy in Smithfield, in 1552, and a friar, called William Roye, who suffered death on the same account in Portugal, he finished it, and in the year 1526, it was printed either at Antwerp or Hamburgh, without a name, in a middle sized 8vo. volume, and without either calendar, concordances in the margin, or table at the end. Tindal annexed a pistil at the close of it, in which he "desyred them that were learned to amende if ought were found amysse." Le Long calls this "the New Testament translated into English, from the German version of Luther;" but for this degrading appellation he seems to have no other authority besides a story related by one Cochlæus (in Actis Martini Lutheri ad an. 1526, p. 132.), with a view of depreciating Tindal's translation. Many copies of this translation found their way into England; and to prevent their dispersion among the people, and the more effectually to enforce the prohibition published in all the dioceses against reading them, Tonstall, bishop of London, purchased all the remaining copies of this edition, and all which he could collect from private hands, and committed them to the flames at St. Paul's cross. The first impression of Tindal's translation being thus disposed of, several other numerous editions were published in Holland, before the year 1530, in which Tindal seems to have had no interest, but which found a ready sale, and those which were imported into England, were ordered to be burned. On one of these occasions, sir Thomas More, who was then chancellor, and who concurred with the bishop in the execution of this measure, inquired of a person, who stood accused of heresy, and to whom he promised indemnity on consideration of an explicit and satisfactory answer, how Tindal subsisted abroad, and who were the persons in London that abetted and supported him; to which inquiry the heretical convert replied, "It was the bishop of London who maintained him, by sending a sum of money to buy up the impression of his Testament." The chancellor smiled, admitted the truth of the declaration, and suffered the accused person to escape. The people formed a very unfavourable opinion of those who ordered the word of God to be burned, and concluded, that there must be an obvious repugnance between the New Testament, and the doctrines of those who treated it with this indignity. Those who were suspected of importing and concealing any of these books, were adjudged by sir T. More to ride with their faces to the tails of their horses, with papers on their heads, and the New Testaments, and other books which they had dispersed, hung about their cloaks, and at the standard in Cheapside to throw them into a fire prepared for that purpose, and to be fined at the king's pleasure.

When Tonstal's purchase served only to benefit Tindal, and those who were employed in printing and selling successive editions of his Testament, and other measures for restraining their dispersion seemed to have little or no effect, the pen of the witty, eloquent, and learned sir Thomas More, was employed against the translator; and the bishop granted him a licence, or faculty, dated March 7, 1527, to have and to read the several books which Tindal and others published; and at his desire sir Thomas composed a dialogue, written with much humour, and designed to expose Tindal's translation, which was published in 1529. In this dialogue he alleges, among other charges, that Tindal had mistranslated three words of great importance, viz. the words priests, church, and charity; calling the first seniors, the second congregation, and the third love. He also charges him with changing commonly the term grace into favour, confession into knowledging, penance into repentance, and a contrite heart into a troubled heart. The bishop of London had, indeed, in a sermon, declared, that he had found in it no less than 2000 errors, or mistranslations; and sir Thomas More discovered above 1000 texts by tale, falsely translated. In 1530, a royal proclamation was issued, by the advice of the prelates and clerks, and of the universities, for totally suppressing the translation of the scripture, *corrupted* by William Tindal. The proclamation set forth, that it was not necessary to have the scriptures in the English tongue, and in the hands of the common

people; that the diſtribution of them, as to allowing or denying it, depended on the diſcretion of their ſuperiors; and that, conſidering the malignity of the time, an Engliſh tranſlation of the Bible would rather occaſion the continuance, or increaſe of errors, than any benefit to their ſouls. However, the proclamation announced the king's intention, if the preſent tranſlation were abandoned, at a proper ſeaſon, to provide that the Holy Scriptures ſhould be by great, learned, and catholic perſons, tranſlated into the Engliſh tongue, if it ſhould then ſeem convenient. In the mean time, Tindal was buſily employed in tranſlating from the Hebrew into the Engliſh the five books of Moſes, in which he was aſſiſted by Miles Coverdale. But his papers being loſt by ſhipwreck in his voyage to Hamburgh, where he deſigned to print it, a delay occurred, and it was not put to preſs till the year 1530. It is a ſmall 8vo. printed at different preſſes, and with different types. In the preface he complained, that there was not ſo much as one *i* in his New Teſtament, if it lacked a tittle over its head, but it had been noted, and numbered to the ignorant people for an hereſy, who were made to believe, that there were many thouſand hereſies in it, and that it was ſo faulty as to be incapable of amendment or correction. In this year he publiſhed an anſwer to ſir Thomas More's dialogue, containing his reaſon for the changes which he had introduced into his tranſlation. The three former editions of Tindal's Engliſh New Teſtament being all ſold off, the Dutch bookſellers printed a fourth in this year, in a ſmaller volume and letter. In 1531, Tindal publiſhed an Engliſh verſion of the prophet Jonah, with a prologue, full of invective againſt the church of Rome. Strype ſuppoſes that before his death he finiſhed all the Bible but the Apocrypha, which was tranſlated by Rogers; but it ſeems more probable that he tranſlated only the hiſtorical parts. In 1534, was publiſhed a fourth Dutch edition, or the fifth in all, of Tindal's New Teſtament, in 12mo. In this ſame year, Tindal printed his own edition of the New Teſtament in Engliſh, which he had diligently reviſed and corrected; to which is prefixed a prologue; and at the end are the piſtils of the Old Teſtament, cloſing with the following advertiſement, "Imprinted at Antwerp, by Marten Emperour, anno M. D. XXXIV." Another edition was publiſhed this year, in 16to. and printed in a German letter. Hall ſays, in his Chronicle, printed during the reign of Henry VIII. by Richard Grafton, the benefactor and friend of Tindal; "William Tindal tranſlated the New Teſtament, and firſt put it into print; and he likewiſe tranſlated the five books of Moſes, Joſhua, Judicum, Ruth, the books of Kings, and books of Paralipomenon, Nehemiah, and the firſt of Eſdras, and the prophet Jonas; and no more of the Holy Scriptures." Upon his return to Antwerp, in 1531, king Henry VIII. and his council, contrived means to have him ſeized and impriſoned. After long confinement he was condemned to death by the emperor's decree in an aſſembly at Augſburg; and in 1536, he was ſtrangled at Villefort, near Bruſſels, the place of his impriſonment, after which his body was reduced to aſhes. He expired, praying repeatedly and earneſtly, "Lord, open the king of England's eyes." Several editions of his Teſtament were printed in the year of his death. Tindal had little or no ſkill in the Hebrew, and therefore he probably tranſlated the Old Teſtament from the Latin. The knowledge of languages was in its infancy; nor was our Engliſh tongue arrived at that degree of improvement, which it has ſince attained; it is not, therefore, ſurpriſing, that there ſhould be many faults in this tranſlation which need amendment. This, indeed, was a taſk, not for a ſingle perſon, but requiring the concurrence of many, in circumſtances much more favourable for the execution of it than thoſe of an exile. Nevertheleſs, although this tranſlation is far from being perfect, few firſt tranſlations, ſays Dr. Geddes (Proſpectus, p. 88.), will be found preferable to it. It is aſtoniſhing, ſays this writer, how little obſolete the language of it is, even at this day; and in point of perſpicuity, and noble ſimplicity, propriety of idiom, and purity of ſtyle, no Engliſh verſion has yet ſurpaſſed it.

Bible, *Coverdale's*. In 1535 the whole Bible, tranſlated into Engliſh, was printed in folio, and dedicated to the king by Miles Coverdale, a man greatly eſteemed for piety, knowledge of the Scriptures, and diligent preaching; on account of which qualities king Edward VI. advanced him to the ſee of Exeter. In his dedication and preface, he obſerves to this purpoſe, that, as to the preſent tranſlation, it was neither his labour nor his deſire to have this work put into his hand; but "when others were moved by the Holy Ghoſt to undertake the coſt of it," he was the more bold to engage in the execution of it. Agreeably, therefore, to deſire, he ſet forth this "ſpecial" tranſlation, not in contempt of other men's tranſlations, or by way of reproving them, but humbly and faithfully following his interpreters, and that under correction. Of theſe, he ſaid, he uſed five different ones, who had tranſlated the Scriptures not only into Latin, but alſo into Dutch. He further declared, that he had neither wreſted nor altered ſo much as one word for the maintenance of any manner of ſect, but had with a clear conſcience purely and faithfully tranſlated out of the foregoing interpreters, having only before his eyes the manifeſt truth of the Scripture. But becauſe ſuch different tranſlations, he ſaw, were apt to offend weak minds, he added, that there came more underſtanding and knowledge of the Scripture by theſe ſundry tranſlations, than by all the gloſſes of ſophiſtical doctors; and he therefore deſires, that offence might not be taken, becauſe one tranſlated "ſcribe," and another "lawyer," one "repentance," and another "penance," or "amendment." This is the firſt Engliſh Bible allowed by royal authority; and alſo the firſt tranſlation of the whole Bible printed in our language. It was called a "ſpecial" tranſlation, becauſe it was different from the former Engliſh tranſlations; as Lewis has ſhewn (Hiſt. Eng. Tranſl. p. 98.) by comparing it with Tindal's. It is divided into ſix tomes, adorned with wooden cuts, and furniſhed with Scripture references in the margin. The laſt page has theſe words: "Prynted in the yeare of our Lorde M.D.XXXV. and fyniſhed the fourth day of October." Of this Bible there was another edition in a large 4to. 1550, which was re-publiſhed, with a new title, 1553; and theſe, according to Lewis, were all the editions of it. Coverdale, in this edition of the Engliſh Bible, prefixed to every book the contents of the ſeveral chapters, and not to the particular chapters, which was afterwards the caſe; and he likewiſe omitted all Tindal's prologues and notes. Soon after this Bible was finiſhed, in 1536, lord Cromwell, keeper of the privy-ſeal, and the king's vicar-general and vicegerent in eccleſiaſtical matters, publiſhed injunctions to the clergy by the king's authority, the ſeventh of which was, that every parſon, or proprietary of any pariſh church within this realm, ſhould, before the firſt of Auguſt, provide a book of the whole Bible, both in Latin and in Engliſh, and lay it in the choir, for every man that would, to look and read therein; and ſhould diſcourage no man from reading any part of the Bible either in Latin or Engliſh, but rather comfort, exhort, and admoniſh every man, to read it, as the very word of God, and the ſpiritual food of a man's ſoul, &c.

Bible, *Matthewe's*, or *Matthews's*. In 1537, another edition of the Engliſh Bible was printed by Grafton and Whit-

Whitchurch, at Hamburgh, as some think, or, as others suppose, at Malborow, or Marpurg in Hesse, or Marbeck in the duchy of Wittemberg, where Rogers was superintendant. It bore the name of Thomas Matthewe, and it was set forth with the king's most gracious licence. Mr. Wanley is of opinion, that, to the end of the book of Chronicles, this edition is Tindal's translation; and from thence to the end of the apocrypha, Coverdale's: but Lewis (p. 107.) thinks it probable that the prophecy of Jonah should be excepted, which Tindal finished in his life-time, and which is the same in this edition, and in Coverdale's Bible of 1535. Mr. Wanley also observed, that the whole New Testament was Tindal's. Bale says, Rogers translated the Bible into English, from Genesis to the end of Revelation, making use of the Hebrew, Greek, Latin, German, and English (i. e. Tindal's) copies. This book contained Tindal's prologue and notes; and, as Heylin says (Hist. Ref. fol. 20.), it was no other than the translation of Tindal and Coverdale somewhat altered. The name of Matthewe is allowed to have been fictitious, for reasons of prudence; one of which was, that the memory of Tindal had become odious to many. It may well be admitted that John Rogers, a learned academic, and the first who was condemned to the flames in the reign of queen Mary, was employed by Cranmer to superintend this edition, and to furnish the few emendations and additions that were thought necessary. This must have been the general persuasion in 1555, as the condemning sentence preferred by Fox (Acts, &c. vol. iii. 125.), is "against Rogers, priest, alias called Matthew." Cranmer presented a copy of this book to lord Cromwell, desiring his intercession with the king for the royal licence, that it might be purchased and used by all. There are extant two letters (Strype's life of Cranmer, p. 5.) from the archbishop, on the subject of lord Cromwell's intercession, expressing warm approbation and acknowledgement. "I doubt not," says he, "but that hereby such fruit of good knowledge shall ensue, that it shall well appear hereafter what high and excellent service you have done unto God and the king; which shall so much redound to your honour, that, besides God's reward, you shall obtain perpetual memory for the same within this realm."—"This deed you shall hear of at the great day, when all things shall be opened and made manifest." In the year 1538, an injunction was published by the vicar-general of the kingdom, ordaining the clergy to provide, before a certain festival, one book of the whole Bible, of the largest volume in English, and to set it up in some convenient place within their churches, where their parishioners might most commodiously resort to read it. A royal declaration was also published, which the curates were to read in their several churches, informing the people, that it had pleased the king's majesty to permit and command the Bible, being translated into their mother-tongue, to be sincerely taught by them, and to be openly laid forth in every parish church. But the curates were very cold in this affair (says Lewis, p. 108.), and read the king's injunctions and declarations in such a manner, that scarcely any body could know or understand what they read. Johnson (Hist. Account, &c. in bishop Watson's Collection, p. 94.) adds, that they also read the word of God confusedly; and that they bade their parishioners, notwithstanding what they read, which they were compelled to read, "to do as they did in times past, and to live as their fathers, the old fashion being the best." Fox observes (Acts, &c. vol. ii. 516.), that the setting forth of this book much offended Gardiner and his fellow bishops, both for the prologues, and especially because there was a table in the book chiefly about the Lord's supper, the marriage of priests, and the mass, which there was said not to be found in scripture. Strype, however, says, (Life of Cranmer, p. 64.), it was wonderful to see with what joy this book was received, not only among the more learned, and those who were noted lovers of the reformation, but generally all over England, among all the common people; and with what greediness God's word was read, and what resort there was to the places appointed for reading it. Every one that could, bought the book, and busily read it, or heard it read: and many elderly persons learned to read on purpose. During a vacancy in the see of Hereford it was visited by Cranmer, who enjoined the clergy to procure, by the 1st of August, a whole Bible in Latin and English, or, at least, a New Testament in these languages; to study every day one chapter of these books, conferring the Latin and English together, from the beginning to the end; and not to discourage any layman from reading them, but encourage them to it, and to read them for the reformation of their lives and knowledge of their duty. In the course of the year 1538, a quarto edition of the New Testament, in the vulgate Latin, and Coverdale's English, bearing the name of Hollybushe, was printed, with the king's licence, by James Nicolson. Of this another more correct edition was published in 1539, in 8vo., and dedicated to lord Cromwell. In 1538, an edition in 4to. of the New Testament, in English, with Erasmus's Latin translation, was printed, with the king's licence, by Redman. In this year it was resolved to revise Matthewe's Bible, and to print a correct edition of it. With this view Grafton went to France, where the workmen were more skilful, and the paper was both better and cheaper than in England, and obtained permission from Francis I. at the request of king Henry VIII. to print his Bible at Paris. But, notwithstanding the royal licence, the Inquisition interposed, and issued an order, dated December 17, 1538, summoning the French printers, their English employers, and Coverdale the corrector of the work, and prohibiting them to proceed; and the impression, consisting of 2500 copies, was seized, confiscated, and condemned to the flames. Some chests, however, of these books, escaped the fire, by the avarice of the person who was appointed to superintend the burning of them; and the English proprietors, who had fled on the first alarm, returned to Paris, as soon as it subsided, and not only recovered some of these copies, but brought with them to London the presses, types, and printers, and, resuming the work, finished it in the following year.

Bible, *Cranmer's*, or the *Great*. As soon as the papal power was abolished in England, and the king's supremacy settled by parliament in 1534, Cranmer was very assiduous in promoting translations of the Holy Scriptures into the vulgar tongue; well knowing how much the progress of the reformation depended upon this measure. Accordingly, he moved in convocation, that a petition should be presented to the king for leave to procure a new translation of the Bible. This motion was vigorously opposed by Gardiner, bishop of Winchester, and his party: but Cranmer prevailed. The arguments for a new translation, urged by Cranmer, and enforced by queen Anne Bullen, who had then great interest in the king's affections, were so much considered by him, that, notwithstanding the opposition, public and private, on the part of Gardiner and his adherents, Henry gave orders for setting about it immediately. To prevent any revocation of the order, Cranmer, whose mind was intent on introducing a free use of the English Scriptures by faithful and able translators, proceeded without delay to divide an old English translation of the New Testament into

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nine or ten parts, which he caufed to be tranfcribed into paper-books, and to be diftributed among the moft learned bifhops, and others; requiring that they would perfectly correct their refpective portions, and return them to him at a limited time. When the affigned day came, every man fent his appropriate portion to Lambeth, except Stokefly, bifhop of London. This laudable defign of the archbifhop failed; but the bufinefs was executed by other perfons, whom he countenanced and encouraged, as we have already ftated in the preceding articles. In April 1539, Grafton and Whitchurch printed the Bible (called the "Great Bible,") in large folio, "cum privilegio ad imprimendum folum." A beautiful frontifpiece, defigned by Holben, and particularly defcribed and exhibited in an engraving by Lewis, p. 122, &c. was prefixed to it: and in the text, thofe parts of the Latin verfion, which are not found in the Hebrew or Greek, are inferted in a fmaller letter; fuch, for inftance, as the three verfes of the 14th pfalm, which are the 5th, 6th, and 7th, in the tranflation of the Englifh liturgy, and the controverted words, 1 John v. 7, 8.; and a mark is ufed to denote a difference of reading between the Hebrew and Chaldee, afterwards explained in a feparate treatife. In this edition Matthewe's Bible was revifed, and feveral alterations and corrections were made in the tranflation, efpecially in the book of Pfalms. Tindal's prologues and notes, and the notes added by others, in the edition of 1537, were wholly omitted. Pointing hands, placed in the margin and in the text, fhew the paffages on which thefe notes were to have been written. Johnfon (ubi fupra, p. 76.) calls this third edition of the Scriptures the Bible in the large or great volume, afcribes it to the year 1539, and fuppofes it to have been the fame which Grafton obtained leave to print at Paris. He fays, that Miles Coverdale compared the tranflation with the Hebrew, mended it in many places, and was the chief director of the work. Agreeably to this, Coverdale, in a fermon at Paul's crofs, defended his tranflation from fome flanderous reports which were then raifed againft it, confeffing "that he himfelf now faw fome faults, which, if he might review the book once again, as he had twice before, he doubted not he fhould amend; but for any herefy, he was fure that there was none maintained in his tranflation." This is related by Dr. Fulk, who was one of Coverdale's auditors. A fecond edition of this Bible feems to have been printed either this or the next year, by Edward Whitchurch; but the copy is imperfect and has no date.

In the courfe of the year 1539, another Bible was printed by John Byddell, called "Taverner's Bible," from the name of its conductor, Richard Taverner, who was educated at Chriftchurch, Oxford, patronifed by lord Cromwell, and probably encouraged by him to undertake the work, on account of his fkill in the Greek tongue. This is neither a bare revifal of the Englifh Bible juft defcribed, nor a new verfion; but a kind of intermediate work, being a correction of what is called "Matthews's Bible," many of whofe marginal notes are adopted, and many omitted, and others inferted by the editors. It is dedicated to the king. After his patron's death, Taverner was imprifoned in the Tower for this work; but he had the addrefs to reinftate himfelf in the king's favour. Wood (Hift. et Ant. Univ. Oxon. fol. 1674, l. ii. p. 264.) gives a particular account of Taverner; attributes his imprifonment to the influence of thofe bifhops who were addicted to the Romifh religion; and informs us, that his verfion was read in churches by royal authority. In November 1539, the king, at the interceffion of Cranmer, appointed lord Cromwell to take fpecial care that no perfon, within the realm, fhould attempt to print any Englifh Bible for five years, but fuch as fhould be admitted by lord Cromwell; and affigns this reafon for the prohibition, that the Bible fhould be confidered and perufed in one tranflation in order to avoid the manifold inconveniences to which human frailty might be fubject from a diverfity of tranflations, and the ill ufe that might be made of it. In the year 1540, two privileged editions of the Bible, which had been printed in the preceding year, iffued from the prefs of Edward Whitchurch. Lewis mentions three other impreffions of the "Great Bible," which appeared in the courfe of this year; two printed by Whitchurch, and one by Petyt and Redman. Cranmer wrote a preface for the editions of the year 1540, from which we learn the opinions and practice of thofe times. In May of this year, the curates and parifhioners of every parifh were required, by royal proclamation, to provide themfelves with the Bible of the largeft volume before the feaft of All-Saints, under the penalty of 40*s.* for every month during which they fhould be without it. The king charged all ordinaries to enforce the obfervance of this proclamation; and he apprized the people, that his allowing them the Scriptures in their mother-tongue was not his duty, but an evidence of his goodnefs and liberality to them, of which he exhorted them not to make any ill ufe. In May 1541, one edition of Cranmer's Bible was finifhed by Richard Grafton; who, in the November following, completed alfo another Bible of the largeft volume, which was fuperintended, at the king's command, by Tonftal, bifhop of Durham, and Heath, bifhop of Rochefter.

In confequence of the king's fettled judgment, "that his fubjects fhould be nurfed in Chrift by reading the Scriptures," he again, on the 7th of May, publifhed a brief, or decree, for fetting up the Bible of the great volume in every parifh church throughout England. However, this decree appears to have been very partially and reluctantly obferved; and the bifhops were charged, by a writer in 1546, with attempting to fuppref the Bible, under pretence of preparing a verfion of it for publication within feven years. After the death of Cromwell in 1540, the bifhops inclined to popery gained ftrength; and the Englifh tranflation was reprefented to the king as very erroneous and heretical, and deftructive of the harmony and peace of the kingdom. In the convocation, affembled in Feb. 1542, the archbifhop, in the king's name, required the bifhops and clergy to revife the tranflation of the New Teftament, which, for that purpofe, was divided into fourteen parts, and portioned out to fifteen bifhops; the Apocalypfe, on account of its difficulty, being affigned to two. Gardiner clogged this bufinefs with embarraffing inftructions; and Cranmer clearly perceiving the refolution of the bifhops to defeat the propofed tranflation, procured the king's confent to refer the matter to the two univerfities, againft which the bifhops protefted; but the archbifhop declared his purpofe to adhere to the will of the king his mafter. With this conteft the bufinefs terminated; and the convocation was foon after diffolved. The Romifh party prevailed alfo in parliament, which enacted a law that condemned and abolifhed Tindal's tranflation, and allowed other tranflations to remain in force, under certain reftrictions. After the paffing of this act, Grafton, the king's printer, was imprifoned; nor was he releafed without giving a bond of 300l. neither to print nor fell any more Englifh Bibles, till the king and the clergy fhould agree on a tranflation. In 1544, the Pentateuch was printed by John Day and William Seres; and in 1546, the king prohibited by proclamation having and reading Wickliffe's, Tindal's, and Coverdale's tranflations, and forbad the ufe of any other than what was allowed by parliament.

liament. From the hiſtory of Engliſh tranſlations, during the reign of Henry VIII. we learn, that the friends to the reformation conducted themſelves with zeal and prudence in the great work of introducing and improving Engliſh tranſlations of the Bible; that they encountered many difficulties from the dangerous inconſtancy of a deſpotic prince, and from the inveterate prejudices of a ſtrong Romiſh party; and that the Engliſh ſcriptures were ſought after and read with avidity by the bulk of the people.

Upon the acceſſion of Edward VI. the ſevere ſtat. 34 & 35 Henry VIII. c. 1. was repealed, and a royal injunction was publiſhed, that not only the whole Engliſh Bible ſhould be placed in churches, but alſo the paraphraſe of Eraſmus in Engliſh to the end of the four Evangeliſts. It was likewiſe ordered by this injunction, that every parſon, vicar, curate, &c. under the degree of a bachelor of divinity, ſhould poſſeſs the New Teſtament, both in Latin and Engliſh, with the paraphraſe of Eraſmus upon it; and that the biſhops, &c. in their viſitations and ſynods ſhould examine them, how they had profited in the ſtudy of the Holy Scriptures. It was alſo appointed that the epiſtle and goſpel of the maſs ſhould be read in Engliſh; and that on every Sunday and holiday, one chapter of the New Teſtament in Engliſh ſhould be plainly and diſtinctly read at matins, and one chapter of the Old Teſtament at even-ſong. But, in the year 1549, when the book of common prayer, &c. was finiſhed, what nearly reſembles our preſent cuſtom was enjoined, that after reading the Pſalms in order at morning and evening prayer, two leſſons, the firſt from the Old Teſtament, and the ſecond from the New Teſtament, ſhould be read diſtinctly with a loud voice. During the courſe of this reign, that is, in leſs than 7 years and 6 months, eleven impreſſions of the whole Engliſh Bible were publiſhed, and ſix of the Engliſh New Teſtament; beſides an Engliſh tranſlation of the whole New Teſtament, paraphraſed by Eraſmus. The Bibles were reprinted, according to the preceding editions, whether Tindal's, Coverdale's, Matthewe's, Cranmer's, or Tavernier's; that is, with a different text, and different notes. But it is doubted by the writer of the preface to king James's tranſlation, whether there were any tranſlation, or correction of a tranſlation, in the courſe of this reign.

In 1562, the "Great Bible," viz. that of Coverdale's tranſlation, that had been printed in the time of Henry VIII. and alſo in the time of king Edward, was reviewed by archbiſhop Parker, and reprinted for the uſe of the church; and this was to ſerve till [illegible] by his grace was ready for publication. See *Biſhop's* BIBLE.

BIBLE, *Geneva*. Many of the principal reformers having been driven to Geneva, during the perſecutions of queen Mary's reign, they publiſhed, in 1557, an Engliſh New Teſtament, printed by Conrad Badius; the firſt in our language which contained the diſtinctions of verſes by numerical figures, after the manner of the Greek Teſtament, which had been publiſhed by Robert Stephens in 1551. R. Stephens indeed, publiſhed his figures in the margin; whereas the Geneva editors prefix theirs to the beginning of minute ſubdiviſions with breaks, after our preſent manner. When queen Elizabeth paſſed through London from the Tower to her coronation, a pageant was erected in Cheapſide, repreſenting Time coming out of a cave, and leading a perſon clothed in white ſilk, who repreſented Truth, his daughter. Truth had the Engliſh Bible in her hand, on which was written "Verbum veritatis." Truth addreſſed the queen, and preſented her with the book. She kiſſed it, held it in her hands, laid it on her breaſt, greatly thanked the city for their preſent, and added, that ſhe would often and diligently read it. Upon a royal viſitation in 1559, the Bible, and Eraſmus's paraphraſe, were reſtored to churches; and articles of enquiry were exhibited whether the clergy diſcouraged any from reading any part of the Scriptures. "Miniſters were alſo enjoined to read every day one chapter of the Bible at leaſt; and all who were admitted readers in the church were daily to read one chapter at leaſt of the Old Teſtament, and another of the New, with good adviſement, to the encreaſe of their knowledge."

During this year, the exiles at Geneva publiſhed the book of Pſalms in Engliſh, with marginal notes, and with a dedication to the queen, dated February 10. In 1560, the whole Bible in 4to. was printed at Geneva by Rowland Hare; ſome of the refugees from England continuing in that city for this purpoſe. The tranſlators were biſhop Coverdale, Anthony Gilby, William Whittingham, Chriſtopher Woodman, Thomas Sampſon, and Thomas Cole; to whom ſome add John Knox, John Bodleigh, and John Pullain; all zealous Calviniſts, both in doctrine and diſcipline: but the chief and the moſt learned of them were the three firſt. Profeſſing to obſerve the ſenſe, and to adhere as much as poſſible to the words of the original, and in many places to preſerve the Hebrew phraſeology, after the labour and ſtudy of two years and more, day and night, they finiſhed their tranſlation, and publiſhed it; with an epiſtle dedicatory to the queen, and another, by way of preface, to their brethren of England, Scotland, and Ireland. Beſides the tranſlation, the editors of the Geneva Bible noted in the margin the diverſities of ſpeech and reading, eſpecially according to the Hebrew; they inſerted in the text, with another kind of letter, every word that ſeemed to be neceſſary for explaining any particular ſentence; in the diviſion of the verſes, they followed the Hebrew examples, and added the number to each verſe; they alſo noted the principal matters, and the arguments, both for each book and each chapter; they ſet over the head of every page ſome remarkable word or ſentence, for helping the memory; they introduced brief annotations for aſcertaining the text, and explaining obſcure words; they ſet forth with figures certain places in the books of Moſes, of the Kings, and Ezekiel, which could not be made intelligible by any other deſcription; they added maps of divers places and countries, mentioned in the Old and New Teſtament; and they annexed two tables, one for the interpretation of Hebrew names, and the other containing all the chief matters of the whole Bible. Of this tranſlation, there were above 30 editions in folio, 4to., or 8vo., moſtly printed by the queen's and king's printer, from the year 1560 to 1616. Editions of it were likewiſe printed at Geneva, Edinburgh, and Amſterdam. To ſome editions of the Geneva Bible, e.g. to thoſe of 1599 and of 1611, is ſubjoined Beza's tranſlation of the New Teſtament, engliſhed by L. Tompſon. (See *Rhemiſh* BIBLE.) Dr. Geddes (Gen. Anſwer, &c. p. 4.) gives an honourable teſtimony to the Geneva tranſlation; and heſitates not in declaring, that he thinks it in general better than that of king James's tranſlators.

BIBLE, *Biſhop's*. In the year 1568, the Bible, propoſed by [illegible] before, was [illegible]. This edition, according to Le Long, was undertaken by royal command; and it is mentioned by Strype, to the honour of the archbiſhop, that he had reſolution to perform what Cranmer, as oppoſed by the biſhops of his days, had in vain endeavoured to accompliſh. In this performance, diſtinct portions of the Bible, at leaſt 15 in number, were allotted to ſelect men of learning and abilities, appointed, as Fuller ſays, by the queen's commiſſion; and, accordingly, at the concluſion of each part, the edition of 1568 has the initial letters of each man's name to the end of the firſt epiſtle to the Corinthians; e.g. at the end of the Pentateuch.

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W.E. for William, bishop of Exeter, whose allotment ended there; at the end of Ruth, R. M. for Richard Menevensis, or bishop of St. David's, to whom pertained the second allotment; and so of the rest. But it still remains uncertain, who, and whether one or more, revised the rest of the N. T. Eight of the persons employed were bishops; whence the book was called the "Bishop's Bible," and the "Great English Bible." The archbishop employed other critics to compare this Bible with the original languages, and with the former translations; one of whom was Laurence, a man famous in those times for his knowledge of Greek, whose castigations the bishop's Bible followed exactly. His grace also sent instructions concerning the method which his translators were to observe; and recommended the addition of some short marginal notes, for the illustration or correction of the text. But the particulars of these instructions are not known. The archbishop, however, directed, reviewed, and finished the whole; which was printed and published in 1568, in a large folio size, and with a beautiful English letter, on royal paper; and embellished with several cuts of the most remarkable things in the O. and N. T. and Apocrypha, maps cut in wood, and other draughts engraven on copper. It has many marginal references and notes, and many useful tables. It has numerous insertions between brackets, and in a smaller character; which are equivalent to the italics afterwards used by James's translators. Dr. Geddes is of opinion, (Letter to the bishop of London, p. 33.) that italic supplements were first used by Arias Montanus, who died in 1598. The several additions from the vulgar Latin, inserted in the "Great Bible," are omitted; and verse 7 of 1 John v. which was before distinguished by its being printed in a different letter, is here printed without any distinction; and the chapters are divided into verses. In the following year, 1569, it was again published in large 8vo. for the use of private families. This Bible was reprinted in 1572, in large folio, with several corrections and amendments, and several prolegomena; this is called "Matthew Packer's Bible." With regard to this Bible, Lewis (p. 61.) observes, that the editions of it are mostly in folio and 4to., and that he never heard but of one in 8vo.; for which he supposes this to be the reason, that it was principally designed for the use of churches. In the convocation of the province of Canterbury, which met in April, 1571, a canon was made, enjoining the church-wardens to see, that the Holy Bible be in every church in the largest volumes, if convenient; and it was likewise ordered, that every archbishop and bishop, every dean and chief residentiary, and every archdeacon, should have one of these Bibles in their cathedrals and families. This translation was used in the churches for forty years; though the Geneva Bible was more read in private houses. For king James's opinion of it, see *King James's* BIBLE.

BIBLE, *Rhemish*. After the translation of the Bible by the bishops, two other private versions had been made of the New Testament; the first by Laur. Tomson, under-secretary to sir Francis Walsingham, made from Beza's Latin edition, together with the notes of Beza, published in 1576, in 8vo. and afterwards in 1599, varying very little from the Geneva Bible; the second, by the papists at Rheims, in 1582, in 4to. called the "Rhemish Bible," or "Rhemish Testament." These finding it impossible to keep the people from having the scriptures in the vulgar tongue, resolved to give a version of their own, as favourable to their cause as might be. It was printed on a large paper, with a fair letter and margin. One complaint against it was, its being translated from the vulgate Latin, and retaining a multitude of Hebrew and Greek words untranslated, for want, as the editors express it, of proper and adequate terms in the English to render them by; as the words *azymes*, *tunike*, *rational*, *holocaust*, *prepuce*, *pasche*, &c. whence Fuller called it, in his quaint manner, "a translation which needed to be translated," and Fuller says that "by all means they laboured to suppress the light of truth, under one pretence or other." They added large annotations, to shew, as they say, the studious reader, in most places pertaining to the controversies of those times, both the heretical corruptions, and false deductions, and also the apostolic traditions, the expositions of the holy fathers, the decrees of the Catholic church, and most ancient councils Some have said, that it was printed in a most costly manner, in order to put it out of the power of common people to purchase it; but if any of the laity secretly procured one of these Rhemish Testaments, he durst not own that he had read it, without previously obtaining from his superior a licence for this purpose. Many of the copies were seized by the queen's searchers, and confiscated; and Th. Cartwright was solicited by secretary Walsingham to refute it; but after a good progress made therein, archbishop Whitgift prohibited his farther proceedings therein, as judging it improper the doctrine of the church of England should be committed to the defence of a puritan, and appointed Dr. Fulk in his place, who refuted the Rheimists with great spirit and learning. Cartwright's refutation was also afterwards published in 1618, under archbishop Abbot, together with the Rhemish translation. This procedure was much more agreeable to the true spirit of protestantism, than the act of seizing and burning the copies; "argument being the only weapon (says the truly excellent primate Newcome), which should be wielded to defend Christianity, or any mode of professing it." Other editions were printed at Antwerp, in 1600, and in 12mo. at the same place, in 1630, and at Paris, in 4to. in 1633. Within 30 years after their New Testament, the Roman Catholics published a translation of the Old, at Doway, hence called the "Doway Bible," in two 4to. volumes, the former in 1609, the other in 1610, from the Vulgate, with annotations. It is said that the translators were William Allyn, afterwards cardinal, Gregory Martin, and Richard Bristow; and that the annotator was Thomas Worthington. But some (Le Long. 418.) ascribe the version of the New Testament chiefly to William Raynold.

BIBLE, *King James's*. The last English Bible was that which proceeded from the Hampton-court conference, in 1603, where many exceptions being made to the Bishop's Bible, king James gave order for a new one; not as the preface expresses it, for a translation altogether new, nor yet to make of a bad one a good one, but to make a good one better, or of many good one best. On the second day of this conference, Dr. Reynolds, the speaker of the Puritans, moved his majesty, that a new translation of the Bible might be undertaken; because those which were allowed in the reigns of Henry VIII. and Edward VI. were corrupt, and such versions as were extant were not answerable to the truth of the original. It has been observed by learned men with regard to the translators in the reign of Henry VIII. that they followed Erasmus and Sebastian Munster too closely; of the Geneva version, that it was formed too faithfully on the model of Beza; and of the Bishop's Bible, that it was not sufficiently exact, but full of errors, because its conductors departed from the Hebrew, and trod too exactly in the footsteps of the Greek. In reply to Dr. Reynolds, the king said, that he had never yet seen a Bible well translated into English; though he considered the Geneva translations as the worst. On the suggestion of Bancroft, bishop of London, he forbad marginal notes; some of the Geneva

notes having been, in his opinion, "very partial, untrue, seditious, and favouring too much of dangerous and traitorous conceits." In 1604, the king commissioned fifty-four learned men of the two universities, and of other places, to confer together; so that nothing should pass without a general consent, in order to make a new and more correct translation of the Bible. Such of these as survived till the commencement of the work were divided into six classes. Ten were to meet at Westminster, and to translate from the Pentateuch to the end of the second book of Kings. Eight, assembled at Cambridge, were to finish the rest of the historical books, and the Hagiographa. At Oxford, seven were to undertake the four greater prophets, with the lamentations of Jeremiah, and the twelve minor prophets. The epistles of St. Paul, and the remaining canonical epistles, were allotted to another company of seven, at Westminster. Another company of eight, at Oxford, were to translate the four gospels, the Acts of the Apostles, and the Apocalypse. Lastly, another company of seven, at Cambridge, had assigned to them the Apocrypha, including the prayer of Manasseh. The king prescribed certain rules, which the translators were required carefully to observe. The Bishop's Bible was to be the standard, from which as few deviations as possible were to be allowed; the names of the prophets, and the holy writers, with the other names in the text, were to be retained as near as possible to their vulgar use; the old ecclesiastical words were to be retained, as the word "church," which was not to be translated "congregation," &c.; of words admitting diversi significations, those were to be retained which had been most commonly used by the most eminent, or most ancient fathers, being agreeable to the propriety of the place, and the analogy of faith; the division of the chapters was to remain with as little alteration as possible; no marginal notes were to be introduced, except for the explanation of Hebrew or Greek words, which could not without circumlocution be duly expressed; quotations were to be annexed in the margin, for the purpose of referring from one scripture to another; every particular person of each company was to take the same chapter or chapters, and having separately translated his appropriate part, all were to meet, to compare what they had done, and to agree as to that which should remain; when any part was finished by the company, it was to be referred to the rest for their serious and judicious consideration; if any doubt or difference occurred, it was to be settled at a general meeting; with respect to places of special obscurity, the opinion of learned persons was to be obtained by letters addressed to them for this purpose; and skilful persons were requested to transmit any observations that might be of use to the company, either at Westminster, Cambridge, or Oxford; the directors in each company were to be the deans of Westminster and Chester, for that place, and the king's professors in the Hebrew and Greek, in each university: and the following translations, if they agreed better with the text than the Bishop's Bible, were to be used, viz. Tindal's, Matthewe's, Coverdale's, Whitchurch's, or the Great Bible, printed in 1539 and 1540, by Whitchurch and Grafton, and the Geneva Bible. The king also intimated his pleasure, that three or four of the most eminent and grave divines of the university, assigned by the vice-chancellor, upon conference with the rest of the heads, should be overseers of the translations, as well Hebrew as Greek. The translation was begun in the spring of 1607, and the completion of it occupied almost three years. When the whole was finished, and three copies of it were sent to London, one from Cambridge, a second from Oxford, and a third from Westminster, two were chosen from the joint companies which had assembled at those places, to review and polish it. The two from the Cambridge companies were Mr. John Bois, fellow of St. John's college, and Mr. Andrew Downes, professor of Greek. These daily met their fellow-labourers in Stationers' hall, London; where, in nine months, they completed their task, and received, each of them, by the week 30l. from the Company of Stationers, whereas, "before they had nothing." The whole was, at last, reviewed by Bilson, bishop of Winchester, and Dr. Myles Smyth, afterwards bishop of Gloucester, who prefixed arguments to the several books; and the latter was ordered to write the preface. This edition of the Bible, with the preface and a dedication to the king, was first published in London, in the year 1611; and is commonly called "King James's Bible." Several editions of it were published in 4to. and in 8vo.; and particularly one by R. Barker, in 1613. In some editions of this Bible, betwixt 1638 and 1685, an alteration is introduced in Acts vi. 3. where, instead of "*We* may appoint," is inserted "*Ye* may appoint," which has been charged on the Independents. But as the first Bible in which it was observed is that printed at Cambridge by Buck and Daniel, in 1638, it is probably an error of the press, without any design to favour any particular party. In 1660, a beautiful edition of this Bible in folio, with chorographical cuts, engraven by Ogilby, was printed at Cambridge, by John Field; and another edition was printed in 8vo. at Amsterdam, in 1664, by John Canne, a leader of the English Brownists, with marginal notes, shewing Scripture to be the best interpreter of Scripture. The editor has prefixed a preface; and the Apocrypha is omitted. A very fine edition of this Bible was published in a large folio, in 1701, under the direction of Dr. Tenison, archbishop of Canterbury, with chronological dates, and an index, by bishop Lloyd, and tables of scripture measures by bishop Cumberland; but this edition abounds with typographical errors. After this translation, all the other versions dropped, and fell into disuse, except the Epistles and Gospels in the Common Prayer Book, which were still continued, according to the Bishop's translation, till the alteration of the liturgy in 1661, and the Psalms and Hymns, which are to this day as in the old version.

About the time when king James resolved on a new translation of the Bible, another translation was finished by Mr. Ambrose Usher, elder brother of the learned primate of Armagh of the same name. It was never printed; but is preserved in MS. in 3 vols. 4to. in the library of Trinity college at Dublin. In 1764, Mr. Anthony Purver published a new translation of the Bible, at London, in 2 vols. folio. We have also had several translations of the New Testament, (see TESTAMENT) and of particular books and parts of the Old and New Testament, the principal of which will be noticed in their proper places.

Learned persons have entertained very different opinions concerning the accuracy and value of the translation, made by order of king James, and now in common use. Bishop Newcome, the late much respected primate of Ireland, has given an abstract of these opinions. Selden recommends it as the "best translation in the world." The committee for religion in the time of Cromwell, A.D 1656, whilst they pretended to discover some mistakes in it, allowed it to be the "best extant;" Walton, in his "Prolegomena," highly commends it; and Poole, in his "Synopsis, &c." says, that "in this royal version occur very numerous specimens of great learning and skill in the original language, and of an uncommon acumen and judgment." In the "Bibliotheca Literaria," A.D 1723, it is observed, that "it made its way by general consent and approbation, without the interposition of authority to enforce it. A sure argument that it is generally esteemed the best we have; though it has still many con-

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ſiderable faults, and very much needs another review." Dr. Wells, in his general preface to the O. T. profeſſes to correct it, "either where it does not give the true ſenſe of the original, or where the true ſenſe is not well expreſſed," according to the modern idiom. The author of an "Eſſay for a New Tranſlation of the Bible, &c." 1727, after ſpeaking in praiſe of this verſion, recommends the attempt to give a more exact tranſlation than any that has hitherto appeared; and he adds, "it were indeed to be wiſhed, that thoſe who are in power did employ men of true learning, and ſolid piety, free from bigotry and blind zeal, in ſo noble and neceſſary a work." "Innumerable inſtances," ſays Blackwall in his "Sacred Claſſics," might be made (in the Engliſh Bible) of faulty tranſlations of the divine original; which either weaken its ſenſe, or debaſe and tarniſh the beauty of its language." He alſo obſerves, that "a new tranſlation can give no offence to people of ſound judgment and conſideration; becauſe every body, converſant in theſe matters, and unprejudiced, muſt acknowledge, that there was leſs occaſion to change the old verſion into the preſent, than to change the preſent into a new one."—"Such an accurate and admirable tranſlation, proved and ſupported by ſound criticiſm, would quaſh and ſilence moſt of the objections of pert and profane cavillers, which chiefly proceed from their want of penetration and diſcernment of the connection of the argument, and their ignorance of the manner and phraſe, of the divine writings. It would likewiſe remove the ſcruples of many pious and conſcientious Chriſtians."—"A new diviſion of the ſacred books into chapters, ſections, and periods, might be ſo contrived and managed as to make a new edition very commodious and beautiful; which would overbalance all inconveniences which ſuperſtition and weakneſs could pretend might ariſe from alterations, and make a victorious and ſpeedy way to the favour and full approbation of the world." There is hardly one chapter in the N. T., ſays this author, that is not faultily divided, in conſequence of which, the connection and meaning of particular paſſages are rendered confuſed and obſcure; whilſt the ſtyle is materially injured. "It is, with pleaſure and juſt veneration," he continues, "to the memory of our learned and judicious tranſlators, that I acknowledge their verſion in the main, to be faithful, clear, and ſolid. But no man can be ſo ſuperſtitiouſly devoted to them, but muſt own that a conſiderable number of paſſages are weakly and imperfectly, and not a few falſely, rendered. And no wonder; for ſince their time there have been great improvements in the knowledge of antiquity, and advancements in critical learning, &c." "If ever" (ſays Dr. Waterland, Scripture Vindicated), "a proper time ſhould come for reviſing and correcting our laſt Engliſh tranſlation, which, though a very good one, and upon the whole ſcarce inferior to any, yet is undoubtedly capable of very great improvements, &c." Doddridge, Weſley, Wynne, Pilkington, Purver, Worſley, Prieſtley, &c. &c. expreſs themſelves to the ſame purpoſe. "To confirm and illuſtrate the holy ſcriptures," ſays the eminently ingenious and learned biſhop Lowth (Viſitation Sermon at Durham, 1758), "to evince their truth, to ſhew their conſiſtence, to explain their meaning, to make them more generally known and ſtudied, more eaſily and perfectly underſtood by all; to remove the difficulties, that diſcourage the honeſt endeavours of the unlearned, and provoke the malicious cavils of the half-learned: this is the moſt worthy object that can engage our attention; the moſt important end to which our labours in the ſearch of truth can be directed. And here I cannot but mention that nothing would more effectually conduce to this end, than the exhibiting of the holy ſcriptures themſelves to the people in a more advantageous and juſt light, by an accurate reviſal of our vulgar tranſlation by public authority. This hath often been repreſented; and, I hope, will not always be repreſented in vain." The late archbiſhop Secker delivers ſimilar ſentiments in his "Latin ſpeech intended to have been made at the opening of the Convocation in 1761, printed at the end of his charges;" London, 1769, p. 363. To the ſame purpoſe are the declarations of Dr. Durell, in his "Critical Remarks on Job, &c." Oxf. 1772. pref. p. 6.; of biſhop Lowth, in his "Prelim. Diſſ. to Iſaiah," 4to. Lond. 1778, p. 69.; of Dr. White, in his "Reviſal of the Engliſh Tranſlation of the O. T. recommended," Oxf. 1779, p. 8, 9, &c. &c. Dr. Kennicott, Green, and Blayney, excellent judges on this ſubject, have concurred in the ſame opinion, of the neceſſity and utility of either a new tranſlation or a reviſal of the old one. The late Dr. Geddes, in his "Proſpectus of a new Tranſlation of the Holy Bible," 4to. Glaſg. 1786, p. 2. expreſſes himſelf in the following language. "The higheſt eulogiums have been made on the tranſlation of James I., both by our own writers, and by foreigners; and indeed, if accuracy, fidelity, and the ſtricteſt attention to the letter of the text, be ſuppoſed to conſtitute the qualities of an excellent verſion, this, of all verſions, muſt, in general, be accounted the moſt excellent. Every ſentence, every word, every ſyllable, every letter and point, ſeem to have been weighed with the niceſt exactitude, and expreſſed, either in the text or the margin, with the greateſt preciſion. Pagninus himſelf is hardly more literal; and it was well remarked by Robertſon, above 100 years ago, that it may ſerve for a lexicon of the Hebrew language, as well as for a tranſlation. It is, however, confeſſedly, not without its faults. Beſides thoſe that are common to it with every verſion of that age, ariſing from faulty originals, and Maſoretic prepoſitions:" it has its own intrinſic and peculiar blemiſhes, which Dr. Geddes enumerates. From a ſuperſtitious attention to render the Hebrew and Greek into literal Engliſh, its authors adopted modes of expreſſion which are abhorrent from the Engliſh idiom; and perhaps from that of all other modern tongues. There is alſo a manifeſt want of uniformity in the mode of tranſlating, which is owing to the variety of perſons employed. The books called apocrypha are, in Dr. Geddes's opinion, generally tranſlated better than the reſt of the Bible; for which one reaſon may be, that the tranſlators of them were not cramped by the fetters of the Maſora. The tranſlators of this verſion miſtook the true meaning of a great many words and ſentences by depending too much on modern lexicons, and by paying too little attention to the ancient verſions. For various reaſons they incumbered their verſion with a load of uſeleſs Italics; often without the leaſt neceſſity, and almoſt always to the detriment of the text. Like other tranſlators of their day, they were too much guided by theological ſyſtems, and ſeem, on ſome occaſions, to have allowed their religious prejudices to have gotten the better of their judgment. Beſides, through the conſtant fluctuation and progreſs of living languages, there are many words and phraſes, in the vulgar verſion, now become obſolete, of which modern writers have ſelected a great variety. The conſtruction alſo is leſs grammatical than the preſent ſtate of our language ſeems to allow; and the arrangement of the words and ſentences is often ſuch as produces obſcurity and ambiguity. Dr. Campbell, in his preface to "The Four Goſpels tranſlated;" Dr. Symonds, in his "Obſervations on the Expediency of reviſing the preſent Engliſh verſion of the Four Goſpels, and of the Acts of the Apoſtles;" Mr. Wakefield, in his "Tranſlation of the N. T.;" and Mr. Ormerod, in his "Short Specimen for an Improvement in ſome parts of the preſent Tranſlation of the O. T.;" unite in recommending

ing a revisal of our present translation. Dr. Symonds, in particular, examines the grounds of an opinion advanced by Lowth, in his "English Grammar," p. 93, and also by many others, which is, that the vulgar translation of the Bible is the best standard of the English language. Distinguishing between the terms *one* of the standards, and the *best* standard, which are very different, he allows that the plain and simple turn of expression, resulting from the choice of old English words, may entitle our version to the former appellation, and yet many other circumstances must be united to confirm its claim to the latter. Accordingly, he suggests the following inquiries: "Are the words and phrases, employed by our translator, generally placed in their proper order? Are they so arranged as to preclude all obscurity and ambiguity? Do we always find the antecedent to which the relatives refer? Hath a right attention been paid to the modes and times of verbs? And is there a due propriety observed in the use of particles, upon which the clearness of a sentence chiefly depends?" The want of conformity to these rules, or to the greater part of them, will not allow our version of the Bible to lay claim to the appellation of the *best* standard of our language. Many other opinions of very respectable writers, decidedly in favour of an improved version of the Bible, might be added to those that are above cited. Objections, however, have been urged against it, by Dr. Vicesimus Knox, in his "Essays Moral and Literary," and also by others; and they have been examined and obviated by the late primate of Ireland, Dr. Newcome, who avows his opinion, that nothing would be more beneficial to the cause of religion, or more honourable to the reign and age in which it was patronised and executed, than an improved English version of the Scriptures.

It has been said, that a new version of the Bible is quite unnecessary. But although our English translation, or any translation extant, contains all things necessary to salvation, yet in common language a measure is said to be necessary, when it is highly expedient. Let any competent scholar study the Bible in the original languages, and then pronounce whether our authorized version is not capable of amendment and improvement, in numberless places, many of which must be considered as very important. If every part of Scripture be intended to answer some important purpose, as it certainly is, or it would not have been given to us, every part ought to be put into the hands of [illegible] as possible from obscurity and error. Some mistakes, among many that may be deemed small, are so considerable as to deprive Christianity of much solid evidence, and furnish the Sceptic with his most formidable weapons. Whilst it is acknowledged that our present version contains every thing necessary to salvation, it may be alleged that if this be a sufficient reason for not correcting those faulty passages which admit of correction, it would be a sufficient reason for throwing them out of it altogether. But as our heavenly Father has been pleased to favour his creatures with additional light, it would ill become us to permit any of this light to be obscured, or to pretend that it is not wanted. If, according to the concessions of some of the objectors to a new version, the faith and practice of illiterate persons are sometimes affected by the present version, and if, in some instances, its obscurity would be removed; religion is a matter of such great concern as to demand from those who watch over its interests, that even these defects should be rectified. It is dangerous to retain any known errors in our national version; they operate differently on different minds; nor is it easy to estimate their degree or effects. The opinions and conduct not only of the unlearned, but of the learned themselves, who do not carefully examine the Scriptures, have in fact been strongly influenced in matters of acknowledged importance, by corrupt readings or mistranslations of a very few texts.

It has again been objected, that a new translation is an extremely dangerous attempt; that nothing would more immediately tend to shake the basis of the establishment; and that it would be imprudent to shock the minds of some very devout and well-meaning people, by an innovation which they could not help considering as an insult on heaven. A measure of this kind would tend to shake the faith of thousands, to whom it were impossible to demonstrate the necessity of a change, or the principles on which it was conducted. Persons of this class would lose their veneration for the old version, without acquiring sufficient confidence in the new: and the benefits must be great indeed, that can compensate even for the remotest possibility of such an evil. To this mode of objecting it has been replied, that it does not immediately affect the merits of the question, but it arraigns the prudence of introducing a correct version, as a measure from which dangerous effects, and not solid advantages, will be apt to arise on the whole. Whatever tends, it has been said, to the perfection of an establishment, would not shake it, but give it splendour, strength, and security. An accurate version would reflect the highest honour on our national church, and may be ranked in an eminent degree among those measures, which would fix it on a basis as firm as truth, virtue, and Christianity. Such a work would be as natural a subject for the praise of all Protestant countries, as king James's Bible was for the honourable testimony born to it by the synod of Dort. It ought also to be recollected, that after Coverdale's translation had received the sanction of authority, the Bibles of Matthewe, Cranmer, Taverner, archbishop Parker, and James I. were all *innovations* in their day; and yet that, considered as different versions, they produced no civil or ecclesiastical commotion, no violent agitation in the minds of men, resembling those which are now apprehended and predicted. Besides, a translation by authority ought to supersede all others from its intrinsic excellence; and it would of course supersede them by the frequency, correctness, and cheapness of its editions, as king James's did that of Geneva, notwithstanding the preference given to it by the Calvinists. Moreover, it is hard to conceive, how the faith of thousands can be shaken by removing stumbling-blocks, instead of retaining them. Absurd belief and corrupt practice arise from an ignorance of the Scriptures; not from the best human inducements and assistances to search and understand them. It is the nature of truth, and especially of divine truth, to captivate those who contemplate it, in proportion as the veil is withdrawn, and its genuine features appear. If ill-founded prejudices should exist among the people, their teachers should seriously labour to remove them. These prejudices are such, as far as they exist, which might be easily removed, or which would not deserve to be regarded. Besides, the public mind might be prepared for it, and disposed to acquiesce in it by previous and frequent recommendations of it on the part of ecclesiastics, who derive weight from their rank, and, which is the highest of all ranks, says a primate of Ireland, from their reputation. A repeated discussion of the topics, that involved the necessity, expediency, and utility of a new version, in discourse, in the pulpit, and from the press, and the concurrence of the best, the wisest, the most learned, and the greatest, in the recommendation, patronage, and conduct of an amended version, would give the bulk of the community as great a confidence in it as they ever reposed in any preceding one.

Some, indeed, may say, "Let us introduce no change; for we cannot tell what further change may be required of us." Had this kind of lukewarm and timid reasoning been

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regarded, neither the reformation, nor the revolution, could have taken place; and we ſhould have been ſtill ſubject to Romiſh ſuperſtition, and to deſpotic power. It is certainly not leſs the part of wiſdom and magnanimity to give up what is wrong, than reſolutely to maintain what is right.

It has been further argued, that the preſent tranſlation derives an advantage from its antiquity, greatly ſuperior to any which could ariſe from a correction of its inaccuracies. Hence it would follow, that the verſions of Tindal, Wickliffe, and Jerom, riſe in excellence. But no age or preſcription can authoriſe error; and it is obſtinacy to defend in any verſion, however ancient or venerable, what cannot be rationally defended. Although it be deſirable that the grave ancient caſt ſhould prevail in an Engliſh tranſlation of the Bible, a tranſlation may nevertheleſs become too antiquated; and in fact our own Bible retains words and forms of ſuch remote uſe, that ſome of them are not underſtood, even by intelligent readers, and many of them are rather harſh and uncouth, than venerable and majeſtic.

But it has been ſaid, that the preſent tranſlation ought to be retained in our churches, on account of its intrinſic beauty and excellence. The language, though ſimple and natural, is rich and expreſſive. Even in the literal tranſlation of the Pſalms, there are paſſages exquiſitely beautiful and irreſiſtibly tranſporting; and where the ſenſe is not clear, nor the connection of ideas obvious at firſt ſight, the mind is ſoothed, and the ear raviſhed with the powerful yet unaffected charms of the ſtyle. Theſe beauties, it is alleged, on the other hand, are found, in an equal, or partly in a ſuperior degree, in our firſt verſion; and muſt be more or leſs found in every verſion of the Hebrew Scriptures, that is not a mere paraphraſe. King James's tranſlators found it in their prototype; the diction and phraſeology they borrowed from their predeceſſors in tranſlation. What is beautiful, what is excellent, what is melodious and raviſhing in the preſent verſion, ſhould unqueſtionably be retained by all future tranſlators; but is there any reaſon for retaining its corruptions, its miſtranſlations, its obſcurities, and its other acknowledged imperfections?

The correcting tranſlators, it will be again urged, differ among themſelves. Differences muſt neceſſarily ariſe among interpreters of the Scriptures. King James's tranſlators often diſagreed as individuals; and adopted in a body what ſeemed to be moſt agreeable to the ſound rules of interpretation. Let a like number of able judges decide, on the ſame principles, between biblical critics of the preſent age. But the new tranſlators recede too far from the common verſion. This, however, in a new verſion, is not neceſſary, nor would it be proper; whilſt they recede from its errors and imperfections; they ſhould retain its general diction and manner, nor ever allow themſelves to deviate from it without a ſatisfactory reaſon.

It has been further intimated, by thoſe who are averſe from a new verſion, that ſuch as wiſh for additional information may have recourſe to thoſe authors, who have explained obſcure and erroneous paſſages. But have all Chriſtians, who meet with difficulties, time and ability to conſult theſe writers? Or if they had, is it in any reſpect decent or fit that the public Scriptures, confeſſed to want aſſiſtance, ſhould be ſuffered to depend for ſupport on theſe extraneous props? The national Bible is the great record of our religion; it is this which the Deiſt attacks, and this muſt ſupply us with our defence.

The objectors proceed with obſerving, that no tranſlation, even of a ſingle book, has yet appeared, preferable on the whole, to the received one. Let it be conſidered, however, that the attempts of individuals neceſſarily labour under great comparative imperfections; and yet theſe ſhould be promoted by the natural patrons of ſacred learning, and parts of the Scriptures ſhould be aſſigned to ſuch as are beſt qualified for the honourable taſk of tranſlating and explaining them; becauſe theſe private verſions and expoſitions will form a moſt uſeful ground-work for a reviſed verſion of the whole Bible by public authority.

After all, it will be ſaid by ſome, who are convinced that our preſent Bible ſhould be reviſed, that this is not a proper time for the undertaking; and that we ſhould wait till, by the further increaſe of light, and progreſs of improvement, we ſhall be able to carry the work to a greater degree of perfection, and, if poſſible, make future reviſals unneceſſary. This argument may be always urged; becauſe religious knowledge will increaſe in proportion as human learning improves, and as new light is obtained from verſions and MSS. that are already known, and that may yet be diſcovered, duly examined, and compared. "But ſhall we, in the mean time, prolong the difficulties of the Chriſtian, and the fancied triumph of the Infidel? The miſtakes already diſcovered are well worthy of correction. Should others of importance be brought to light in the next or ſubſequent generation, let them alſo be corrected. The true rule in this caſe is, to reviſe as often as reviſion is neceſſary. To defer this longer is an injury to religion; to put it off till it can be done in ſuch a way as to preclude the neceſſity of future reviſals, is in fact to put it off for ever." "The taſte of the age for ſound logic, ſound criticiſm, and ſound philoſophy, has acquired ſufficient ſtrength to triumph over their oppoſers."

In favour of an improved verſion of the Bible, for national uſe, it has been argued, that ſuch a tranſlation becomes neceſſary by the unavoidable fluctuation of living languages. The ſtyle of Wickliffe's verſion, and of Tindal's, very widely differs in the courſe of 148 years; and the Engliſh language underwent alſo a great change between the publication of Tindal's Bible and that of king James's, in an interval of 81 years. Since the year 1611, when the preſent verſion firſt appeared, our language has acquired a great degree of copiouſneſs, of elegance, of accuracy, and perhaps of ſtability. Many words and phraſes which occur in the reviſed verſion are become unintelligible to the generality of readers; and many, which are intelligible, are ſo antiquated and debaſed, as to excite diſguſt among the ſerious, and contempt and deriſion among libertines. Pilkington (Remarks on ſeveral paſſages of Scripture, Camb. 8vo. 1759); Purver (Tranſlation of the Bible); Dr. Symonds (Obſervations on the expedieney of reviſing the preſent Engliſh verſion, &c. Camb. 4to. 1789); Dr. Wells (Pref. to Comment on the O. T.); Dr. Campbell (Four Goſpels tranſlated from the Greek, 4to. Lond. 1789); and Dr. Geddes (Proſpectus); have ſelected many words and phraſes that require correction, and that admit of obvious improvement. The ſtyle of a biblical verſion is a matter of importance; both as it invites the peruſal of a book which the Spirit of God inſpired, and as it influences the national language and taſte. Whatever merit be allowed to the verſion now in uſe, with regard both to its interpretations as well as its ſtyle, it muſt be allowed that, ſince the period in which it was executed, the biblical apparatus has been much enriched by the publications of polyglotts; of the Samaritan pentateuch; of ancient and modern verſions; of lexicons, concordances, critical diſſertations, and ſermons; books of eaſtern travels; diſquiſitions on the geography, cuſtoms, and natural hiſtory of the Eaſt; accurate tables of chronology, coins, weights, and meaſures. Many Hebrew and Samaritan MSS.; many early printed editions of the Hebrew Scriptures, have been collated by Kennicott and

and De Rossi; the eastern languages, which have so close an affinity with the Hebrew, have been industriously cultivated at home and abroad; the Masoretic punctuation is now ranked among useful assistances, but no longer implicitly followed; and the Hebrew text itself is generally allowed to be corrupt in many places, and therefore capable of emendation by the same methods which are used in restoring the integrity of all other ancient books. With such an accession of helps, with light poured in from every part of the literary world, with such important principles, and with the advancement of critical skill to apply them, it is natural to conclude that many mistakes and absurdities may be removed from the present version, and that the precision, beauty, and emphasis of the original, may be communicated to it in various places. The present state of the Hebrew text in its reference to a new version of the O. T. has been already represented in the commencement of this article: and that of the text of the New Testament will be the subject of a future article; see TESTAMENT.

Dr. Newcome, in his "Attempt towards an improved version, &c. of the Minor Prophets," published in 1785, proposed a variety of rules for conducting a new translation of the Bible. These have been since corrected and enlarged (ubi infra); and in order to render this article, the subject of which is highly important and interesting, as complete and as satisfactory to biblical readers as our limits will allow, we shall here subjoin the most material parts of them. The learned prelate proposes, in the first place, that a plan, resembling the regulations prescribed to king James's translators, should be deliberately adjusted by a large committee of judicious and learned men. A more select committee, well acquainted with the original tongues in which the Bible is written, should then be appointed by proper authority, who should invite every scholar to contribute his remarks; who should have their respective parts assigned them: and who, after the performance of their allotted tasks, should amicably unite in advancing the whole to its proper degree of perfection. The *first* of his rules is, that a translation of the Bible should express every word in the original by a literal, verbal, or close rendering, where the English idiom admits of it. This rule admits of some few exceptions; but it excludes unnecessary deviation from the grammatical form of the original words; unnecessary paraphrase, which enervates the force of the original, disguises its manner, and sometimes suggests a wrong idea; sentential renderings; and such as are defective. The *second* rule directs the translator, where the English idiom requires a paraphrase, to endeavour so to form it as to comprehend the original word or phrase; and to express the supplemental part in Italics, except where harshness of language results from the adoption of this method. The *third* rule recommends, in cases where a verbal translation cannot thus be interwoven, the substitution of one equivalent to it, and which implies the reading in the original; but the idiom in the text should be literally rendered in the margin. By observing the second and third rules, the utmost fidelity to the original will be shewn, which is the primary duty of a biblical translator; the customs and manners of the eastern nations will be explained; the peculiar genius of the original languages will be exhibited; and the reader unskilled in them will be best enabled to interpret for himself. The *fourth* rule requires, that the language of a biblical translation should be pure, or conformable to the rules of grammar. The *fifth* rule directs, that propriety should be a prevailing character in the words and phrases of a biblical translation; that is, they should have the sanction of use and the signification given to them should be warranted by the best speakers and writers. In order to preserve the venerable turn of our present version, some few exceptions may be allowed under this general rule. The *sixth* rule enjoins the translators to retain the simplicity of the present version; for which purpose they should exclude foreign words, and the pomp and elegance of modernised diction. The *seventh* rule inculcates perspicuity. The *eighth* rule recommends the same original word, and its derivatives, according to the different leading senses, and also the same phrase, to be respectively translated by the same corresponding English word or phrase; except where a distinct representation of a general idea, or the nature of the English language, or the avoiding of an ambiguity, or elegance of style, or harmony of sound, requires a different mode of expression. In conformity to this rule, it is proposed, that translators should previously agree on the rendering of certain words and phrases. Accordingly, the original word "Jehovah," which expresses the self-existence of the deity, and which, so far from being barbarous, is a grand and magnificent term, should be retained:—that it should be considered, by the help of concordances, whether the same word can always be rendered in the same manner; and that when an English word suits every place, it should invariably be used:—that if the original word cannot always admit of the same rendering, of which many examples occur, the different renderings may be reduced to as few as possible, and those the fittest which the English language affords:—that different words, which have the same, or nearly the same sense, should be distinguished in translating them, when the English tongue furnishes distinct and proper terms:—and that parallel passages should be rendered in the same words. The *ninth* rule requires that the collocation of words should never be harsh and unsuited to an English ear. The *tenth* rule recommends to translators of the Bible a suitable degree of beauty and elegance. This beauty, in its prevailing character, must be easy and natural, simple and severe; free from laboured ornament and artful variety of phrase. The style, like that of the original, must be raised in the poetical parts, but not inflated, and plain in the historical parts, but not abject. "Let nothing," says Dr. Symonds (ubi supra), "be admitted into the text, which we cannot read with pleasure, as well as with advantage." In the *eleventh* rule it is required, that dignity should characterize a version of the Bible. The opposite extreme results from the introduction of debased and offensive terms or phrases; of which some are degraded by familiar use, others are colloquial and vulgar Anglicisms; and modern phraseology, as such, is undignified in a translation of the Bible. The *twelfth* rule prescribes energy as another characteristic of a biblical translation. This quality is obtained, in a great degree, by simplicity and propriety in the terms that are selected to represent the peculiar notions conveyed by the sacred writers, and by expressing the clauses contained in the original with due conciseness. The forcible style of the Scriptures is enfeebled by epithets and paraphrase; nor does their majesty more disdain the defect of ornament, than the excess of it. A version of the Bible will derive much force by retaining those Hebraisms which the English language easily admits, or to which an English ear is now accustomed. Obscure Hebraisms, such as weaken the signification of the original, and those which misrepresent its meaning, should be avoided. In the *thirteenth* rule it is recommended to continue the old ecclesiastical terms, such as repentance, mystery, elect, predestinated, &c. which are now part of our theological language, and of which explanations perpetually occur. Rule *fourteenth*. Metaphors are, in general, to be retained. By observing this rule, the genius of a language, and the nature and customs of a country, will often ap-

Rule *fifteenth*. Proper names ſhould remain as they are now written in thoſe places where they are moſt correctly repreſented. Rule *ſixteenth*. The beſt known geographical terms ſhould be inſerted in the text; and thoſe of the original in the margin; e. g. Syria, marg. Aram; Ethiopia, marg. Cuſh. Rule *ſeventeenth*. The language, ſenſe, and punctuation of our preſent verſion ſhould be retained, unleſs when a ſufficient reaſon can be aſſigned for departing from them. Rule *eighteenth*. The critical ſenſe of paſſages ſhould be conſidered, and not the opinions of any denomination of Chriſtians whatever; ſo that the tranſlators ſhould be philologiſts, and not controverſialiſts. Rule *nineteenth*. Paſſages already admitted into the common verſion, but which are allowed to be marginal gloſſes, or about the authenticity of which critics have reaſon to be doubtful, ſhould be placed in the text between brackets. Rule *twentieth*. In the beſt editions of the Bible, the poetical parts ſhould be divided into lines anſwering to the metre of the original; or ſome other method ſhould be uſed to diſtinguiſh them from proſe. But if it ſhould be thought adviſable to exclude the poetical diſtribution from our Bibles, and confine it to the proluſions of the ſcholar, ſome proper mark of diſtinction for metrical pauſe, as the Hebrew Rebhiang or two horizontal points placed over a word, may be admitted into the authorized impreſſions of the Old Teſtament; or, at leaſt, the contents prefixed may advertiſe the reader of the paſſages generally allowed to aſſume the tone and form of poetry. Rule *twenty-firſt*. Of dark paſſages, which exhibit no meaning as they ſtand in our preſent verſion, an intelligible rendering ſhould be made on the principles of ſound criticiſm. Under this head of ſound criticiſm, Newcome includes that which is conjectural, the ſober uſe of which he frequently recommends. But it admits of doubt, whether conjecture can ever be authorized in a tranſlation which is intended for general uſe; for if it be exerciſed on ſlight occaſions, it muſt be in ſome degree ſuperfluous; if on material ones, it muſt ever be indeciſive. The learned prelate, however, lays down the following canons for this kind of criticiſm. Never ſuppoſe that the text is corrupted without the moſt cogent and convincing reaſons. Never have recourſe to conjectural criticiſm, until every other ſource has been tried and exhauſted. Let all corrections be conſiſtent with the text, and with one another. Inſert no correction, however plauſible or even certain, in the text, without warning the reader, and diſtinguiſhing it by a proper note. For other inſtructions, more immediately deſigned for the editor of ſuch a new verſion, we refer to the author himſelf; as well as to his appendix, for a liſt of the various editions of the Bible, together with an account of the libraries public or private, in which they are to be found. Another more complete liſt of this kind is prefixed to biſhop Wilſon's Bible. See Lewis's Tranſlations of the Bible, 8vo. 1739. Johnſon's Hiſtorical Account of the ſeveral Engliſh tranſlations of the Bible, in biſhop Watſon's Collection of Theological tracts, vol. iii. p. 60—100. Newcome's Hiſtorical View of the Engliſh Biblical Tranſactions, &c. 8vo. Dublin, 1792.

Bibles, *Welch*. There was a Welch tranſlation of the Bible made from the original in the time of queen Elizabeth, in conſequence of a bill brought into the houſe of commons for this purpoſe in 1563. The act 5 Eliz. c. 28. reciting, that in Wales the people were popiſhly inclined, and very ignorant, put the direction of this work into the hands of the biſhops of Hereford, St. David, Bangor, Landaff, and St. Aſaph, who were to inſpect the tranſlation, and take care that ſuch a number ſhould be printed as would provide every cathedral, collegiate, and pariſh-church, and chapel of eaſe, within their reſpective dioceſes, where Welch was commonly ſpoken, with one copy. It was printed in folio, in 1588. Another verſion, which is the ſtandard tranſlation for that language, was printed in 1620. It is called Parry's Bible. An impreſſion of this was printed in 1690, called Biſhop Lloyd's Bible. Theſe were in folio. The firſt octavo impreſſion of the Welch Bible was made in 1630.

Bibles, *Iriſh*. The New Teſtament having been tranſlated into Iriſh by William Daniel, archbiſhop of Tuam, Bedell, who was advanced to the ſee of Kilmore and Ardagh, in 1629, firſt procured the Old Teſtament to be tranſlated by one King; but the tranſlator being ignorant of the original languages, and having done it from the Engliſh, the biſhop himſelf reviſed and compared it with the Hebrew, the Septuagint, and the Italian verſion of Diodati. He ſupported Mr. King to the utmoſt of his ability, whilſt he was engaged in this work; and when the tranſlation was finiſhed, he would have printed it in his own houſe, and at his own charge, if the troubles in Ireland had not prevented it. The execution of his benevolent deſign was alſo impeded in conſequence of the notice that was given of it to the lord lieutenant and the archbiſhop of Canterbury, who thought it diſgraceful for a nation to have a Bible publiſhed, which had been tranſlated by ſuch a deſpicable perſon as King. However, the tranſlation eſcaped the hands of the rebels, and it was afterwards, viz. in 1685, printed at the expence of the Hon. Robert Boyle.

Bibles, *Gaelic*. The Bible was tranſlated and publiſhed by the Society in Scotland for promoting Chriſtian knowledge, in the Gaelic language, for the uſe of their ſchools, and of the people in the Highlands, at different periods, and in detached portions, as the funds of the ſociety allowed. In 1767, the New Teſtament in Gaelic was publiſhed by itſelf; and in various ſucceſſive years, and in ſeparate volumes, the ſeveral books of the Old Teſtament were publiſhed. In 1796, the firſt edition of the New Teſtament being exhauſted, the ſociety publiſhed another, conſiſting of 20,000 copies. And as ſome of the firſt printed volumes of the Old Teſtament have been ſo much reduced in number, as to be inſufficient to ſupply the urgent demands of the Highlands in general, and of the Society's own ſchool in particular, a new edition of 20,000 copies has been lately undertaken (in 1803), at an expence of 2284l. 16s. defrayed by voluntary ſubſcription. An act of charity, highly important and laudable, as the perſons, for whoſe accommodation it is deſigned, amount to no leſs than 335,000; of whom, it is computed, that 300,000 underſtand no other language than the Gaelic, or at leaſt cannot comprehend a book written, or a continued diſcourſe ſpoken, in any other.

Bible-Doctors, in *Eccleſiaſtical Hiſtory*, a denomination by which the Schoolmen of the twelfth and thirteenth centuries were diſtinguiſhed, who made the Scriptures the chief ſubject of their ſtudies, and text of their lectures. However, in the courſe of the thirteenth century, the holy Scriptures, together with thoſe who ſtudied and explained them, fell into great neglect and even contempt. The Bible-Doctors were ſlighted as men of little learning or acumen; they had few ſcholars, and were not allowed an apartment, or a ſervant to attend them, or even a ſtated time for reading their lectures, in any of the famous univerſities of Europe. The illuſtrious Roger Bacon inveighed very bitterly againſt this abuſe; and his excellent friend, Robert Grouthead, biſhop of Lincoln, wrote a pathetic letter to the regents in theology in the univerſity of Oxford, on this ſubject; earneſtly intreating them to lay the foundations of theological learning in the ſtudy of the Scriptures, and to devote the morning hours to lectures on the Old and New Teſtaments.

But

But all these remonstrances and exhortations had little or no effect.

BIBLIA, or BIBLIA *petraria*, in a military sense, denotes a machine used by the ancients for throwing stones or darts.

BIBLIANDER, THEODORE, in *Biography*, whose true name was *Buchman*, a learned protestant divine, was born in 1504, at Bischoffzell near St. Gall, in Switzerland. He officiated as professor of divinity at Zurich from 1532 to 1560, when he was declared emeritus, or past service, not because he was incapable of executing his office, but because he had advanced opinions that deviated from the standard of orthodoxy with regard to the doctrine of predestination. He died of the plague, at Zurich, in 1564. He was well acquainted with the oriental languages, and published, in 1550, an edition of the Koran; the text of which, Bayle says, he corrected by a collation of the Arabic and Latin copies; and he added marginal notes, pointing out and refuting its absurdities. But others say, that this edition is faulty, and dispute Bibliander's skill in the oriental languages. To this edition he subjoined the lives of Mahomet and his successors, and prefixed an apology, by way of preface, which gave great offence by maintaining the lawfulness and utility of a free perusal of books adverse to true religion. He also wrote several other books on theological subjects, some of which are printed, and others remain in MS. in the library at Zurich. He likewise finished the Bible of Leo Juda, called the "Zurich Bible," and printed in 1543, and translated from the Hebrew into Latin the last 8 chapters of Ezekiel, Daniel, Job, Ecclesiastes, the Canticles, and the last 48 Psalms. Gen. Dict.

BIBLIOGRAPHIA, a branch of *archæographia*, employed in the judging and perusing of ancient manuscripts, whether written in books, paper, or parchment. The sense of it is now extended, and it signifies a work intended to give information concerning the first, or best editions of books; and the ways of selecting and distinguishing them properly. In short, it is used for a *notitia*, or description of printed books, either in the order of the alphabet of the times when printed, or of the subject-matters. In which sense, bibliographia amounts to much the same with what is otherwise called *bibliotheca*.

Literary journals afford also a kind of bibliographia.

BIBLIOMANCY, a kind of divination performed by means of the Bible. This amounts to much the same with what is otherwise called *sortes biblicæ*, or *sortes sanctorum*. See SORTES. It consisted in taking passages of Scripture at hazard, and drawing indications thence concerning things future; as in Augustin's *tolle et lege*. It was much used at the consecration of bishops. F. J. Davidius, a Jesuit, has published a bibliomancy, under the borrowed name of *Veridicus Christianus*.

BIBLIOMANIA, an extravagant passion for books, to a degree of madness; or a desire of accumulating them beyond all reason and necessity.

BIBLIOTHECA, from βιβλος, *book*, and θηκη, *repository*, from τιθημι, *I lay up*, properly signifies a library, or repository of books. See LIBRARY. It is also used for a compilation of all that has been written on a certain subject; or a digestion of all the authors who have treated of it. In this sense, we have historical bibliothecæ, as that of Diodorus Siculus; mythological bibliothecæ, as that of Apollodorus; theological and sacred bibliothecæ, as those of Ravanellus, &c. It is also used for a catalogue of the books in a library; such are the *bibliotheca Colbertiana*, *bibliotheca Cordesiana*, *bibliotheca Thuanea*, *bibliotheca Bigneniana*, *bibliotheca du Boisiana*, &c.

L'Abbe has published a *bibliotheca* of *bibliothecæ*, or a catalogue of the names of those who have written bibliothecæ, which has since been continued and improved under another title by Tessier, from 800 writers to the number of no less than 2500. Schrammius has also published a *programma* on the writers of theological bibliothecæ.

BIBLIOTHECA is a name given to the books of the Old and New Testament, in respect of their excellency, and sufficiency for the uses of the Christian life; and it is also a title given to divers journals, or periodical accounts in French of new books.

BIBLIOTHECA *Patrum*, or *of the Fathers*, is a collection of the writings of the lesser fathers, printed in one or more volumes. The first of this kind was published at Paris by Marg. de la Bigne in 1576.

BIBLIOTHECARIAN, a library keeper, otherwise called *librarian*.

The word is also used for the author of a bibliotheca, or a catalogue of books.

In this sense, P. L'Abbe has given a bibliotheca, or catalogue of bibliothecarians. Gesner, Lipenius, Struvius, Fabricius, &c. are celebrated bibliothecarians.

BIBLIOTHEQUE MUSICALE. See MUSICAL *Library*.

BIBLIS, in *Entomology*, a species of PAPILIO, with black dentated wings, and a band of sanguineous spots on the posterior ones. It is a native of America, and called *papilio hyperia* by Cramer. Gmelin. *Obs.* This must not be confounded with *papilio biblis* of Cramer, which is a very different insect, and seems to be a variety of *papilio penthesilea* of Fabricius.

BIBLIS *Fons*, in *Ancient Geography*, a celebrated fountain of Ionia, situate E.S.E. of Miletus. It is mentioned by Pausanias and Ovid.

BIBLISTS, *biblistæ*, an appellation given by some Romish writers to those who profess to adhere to Scripture alone as the sole rule of faith, exclusive of all tradition and the supposed authority of the church. In which sense, all protestants are, or ought to be, biblists. Biblists, among Christians, answer nearly to Caraites or Textuaries among the Jews. The Christian doctors were divided, towards the close of the twelfth century, into two classes; viz. the biblici, and the scholastics: the former were called *doctors of the sacred page*, because they explained the doctrines of Christianity in their manner by the sacred writings; however, their reputation declined, and the scholastic theology prevailed in all the European colleges till the time of Luther. See BIBLE-*Doctors*.

BIBLUS, in *Botany*, an aquatic plant in Egypt, called also *papyrus*; of the skin whereof the ancient Egyptians made their paper. See PAPYRUS, and PAPER.

Hence also the Greeks gave the denomination βιβλος to books made of it. See BIBLE.

BIBLUS, in *Ancient Geography*, a river in the island of Naxia.

BIBONA, a place of Gallia Aquitanica, in the route from Burdigala to Segodum.

BIBORA RIVER and BAY, in *Geography*, lie to the east of Cartago bay, on the main land of Honduras, about N. lat. 14° 20'. W. long. 83° 45'.

BIBRA, BEBRA, or BIEBRA, a town of Germany, in the circle of Upper Saxony, in Thuringia, 10 miles west of Naumburg, and 8 south of Querfurt.

BIBRACTE, in *Ancient Geography*, a citadel of the Ædui, according to Strabo, but according to Cæsar, a fortified town of Gaul, the capital of which was large and populous, now desolate; about 4 miles to the north-west of Autun, and called Beureét, Bevray, and Bray.

BIBRAX, BIBVRE, a town of Belgica, in Gaul, in the country of the Rhemi, north-west of Durocortorum. This town was attacked with great fury by the other Belgic nations, because it had declared for Cæsar. Cæs. Bel. Gal. l. 2. c. 7.

BIBRICH, in *Geography*, a town of Germany, in the circle of the Upper Rhine, and principality of Naſſau Saarbruck Uſingen, 3 miles S.S.W. of Wiſbaden.

BIBROCI, in *Ancient Geography*, an ancient people of Britain, who are ſuppoſed to have occupied the ſouth-eaſtern part of Berkſhire, from the Lodden on the weſt to the Thames on the eaſt. Theſe people undoubtedly came from that part of Gaul, where the town Bibrax was ſituated, and their name leads us to the diſcovery of their origin, as well as of the place of their reſidence in this iſland. It is not certainly known when this colony of the Bibroci left their native country, and ſettled in Britain, though it is probable that it was not long before Cæſar's invaſion, to whom, perhaps, they were engaged to ſubmit by the influence and example of their friends and countrymen in Gaul. As the Bibroci were but a ſmall nation, they ſeem to have been ſubdued by ſome of their neighbours before the invaſion of Claudius, and therefore they are no further mentioned in hiſtory. The name of the hundred of Bray, on the Thames, near Maidenhead, is evidently derived from the name of theſe ancient inhabitants; as the ancient Bibracte, in France, now bears the name of Bray.

BICALCARATUS, in *Zoology*, a ſpecies of Pavo, of a brown colour, with the head ſlightly creſted, and two ſpurs on each leg. Gmelin. This is *pavo Chinenſis* of Briſſon; *l' eperonnier* of Buffon; *petit paon de Malacca* of Sonnerat; *peacock pheaſant* of Edwards; and *iris peacock of* Latham.

This ſplendid bird is a native of China; in point of ſize it rather exceeds the common pheaſant, and has a blackiſh bill, with the baſe of the upper mandible red from the noſtrils; the irides are yellow; creſt ſmall, though compoſed of ſome pretty long feathers, and of a dull brown colour; the face is naked; ſides of the head white; neck brown, ſtriated acroſs with duſky; upper parts of the back, ſcapulars, and wing-coverts dull brown, dotted with pale brown, and yelloviſh; and near the end of each feather a rich and gloſſy purple ſpot, changeable to green, to blue, or gold, in different points of view; lower part of the back and rump brown, ſpotted with white, and body beneath brown, ſtriated tranſverſely with black; upper tail coverts longer than the tail, and each marked with a fine purple ſpot near the end, encircled with black and orange; legs and claws brown. This is the deſcription of the male. The female is one third ſmaller; head, neck, and upper parts brown; head ſmooth; feathers on the upper parts marked with a dull blue ſpot, encircled with dull orange; and the legs have no ſpurs.

BICARI, in *Geography*, a river of Sicily, which runs into the Termini, 2 miles weſt of Sclafani.

BICARINATA, in *Zoology*, a ſpecies of Lacerta, with compreſſed tail of moderate length, and carinated above; on the back four rows of carinated ſcales. This is of a greyiſh colour, and inhabits South America and India. Gmel. &c.

BICAUDALIS, in *Anatomy*, an appellation given by ſome anatomiſts to a muſcle of the external ear, uſually denominated the *retrahens*, or *retrahentes auris*, which ſee.

Bicaudalis, in *Ichthyology*, a ſpecies of Ostracion, of a triangular form, with two ſub-caudal ſpines, and ten rays in the dorſal fin. Gmelin. There is a ſuppoſed variety of this fiſh found in India, and deſcribed by Artedi, in which the body is entirely covered with ſpots and tubercles.

BICE, or Bise, among *Painters*, a blue colour, prepared from the *lapis Armenus*, formerly brought from Armenia, but now from the ſilver mines in Germany. Phil. Tranſ. N° 179. p. 26. Doſſie, v. i. p. 95. Bice is ſmalt reduced to a fine powder by levigation. See Smalt.

The word comes from the barbarous Latin *biſus*, or *biſius*; and that, perhaps, from the French *bis*, *grey*, *griſius*; whence *biſius panis*. Vide Du-Cange, Gloſſ. Lat. tom. i. p. 565. Skin. Etym. in voc.

Bice bears the beſt body of all bright blues, uſed in common work; but is the paleſt in colour. It works indifferently well; but inclines a little to be ſandy, and therefore requires good grinding on a very hard ſtone, and ſhould be waſhed before it is uſed. It lies beſt near the eye of any blue now in uſe, except ultramarine. Its goodneſs lies in the brightneſs and coolneſs. It was formerly uſed in oil, and more frequently in water colours; but it is now much out of uſe. We have alſo a green bice, made of the blue, with the addition of orpiment; and ſeveral compoſitions of indigo and verditer, with chalk and other cheap ſubſtances, are ſold under the name of bice.

Bice, in the *Mythology of the Hindoos*, the name of one of their Caſts, proceeding from Brahma, the immediate agent of the creation, under the ſupreme power. It derives its appellation from the belly or thighs, and denotes nouriſhment, and it was deſtined by its founder to provide the neceſſaries of life by agriculture and traffic.

BICEPS, from *bis* and *caput*, in *Anatomy*, is a name common to ſeveral muſcles, which conſiſt of two diſtinct portions, called heads. Thoſe which are commonly known at preſent by that appellation are the following.

Biceps *flexor cubiti*. The longer portion, or head, of this muſcle, ariſes by a tendon from the upper part of the glenoid cavity of the ſcapula; it then paſſes through the ſhoulder joint, and deſcends in the groove in the upper part of the os brachii, afterwards the fleſhy fibres begin to be attached to it. The ſhorter portion ariſes tendinous and fleſhy from the coracoid proceſs of the ſcapula, in common with the coraco-brachialis muſcle; a little below the middle of the os brachii, the heads unite and form a bulky muſcle, the fibres of which terminate below in a ſtrong roundiſh tendon, which is inſerted into a tubercle, at the upper end of the radius, at that part which is next to the ulna. At the commencement of the lower tendon of this muſcle, an aponeuroſis is ſent off from it, which ſoon expands into the faſcia of the fore-arm.

The uſes of this muſcle are numerous, and the conſideration of them affords a good demonſtration of the impropriety of denominating a muſcle from any ſingle office which it may ſerve, as it tends to limit our ideas of its utility. The action of this muſcle tightens the faſcia of the fore-arm; it turns the hand ſupine; it bends the joint of the elbow; it raiſes the arm towards the ſhoulder; and occaſionally it brings the bones of the ſhoulder to the arm.

Biceps *flexor cruris*. The long portion, or head, of this muſcle ariſes, in common with the ſemi-tendinoſus, from the upper and back part of the tuberoſity of the os iſchium; the ſhort portion ariſes from the linea aſpera on the back part of the thigh-bone. Theſe two portions having conjoined, produce a ſtrong tendon a little above the external condyle of the os femoris, which forms the outer ham ſtring, and which is attached to the upper part or head of the fibula. The chief uſe of this muſcle is to bend the leg upon the thigh, and when it is brought into that ſituation, to turn the leg outwards.

BICESTER, in *Geography*, a market-town of Oxfordſhire, England, is ſituated in a valley on the banks of a ſmall river, which falls into the Charwell, at Iſlip. It is a large reſpectable town, divided into two parts, called Market-end, a pariſh, and King's-end, a hamlet. This place and its vicinity have been poſſeſſed by the Romans, as its name implies; and many Roman coins, and other memorials of that people, have been diſcovered here and at Alceſter, or Old Cheſter, at different times. The embankments at the latter place are nearly obliterated by the plough; but from the name, and the antiquities that have been found, it ſeems evidently

deeply to have been a Roman ſtation. "Alchcſter, Al-cair, or Cair-Allect," ſays Dr. Plott, "was a walled town that ſtood in the north-eaſt parts of Oxfordſhire, built, as may be collected from many probabilities, by Caius Allectus, one of the thirty tyrants, who, by ſlaying his dear friend and emperor Carauſius, obtained the ſole government of Britain."

The Oxford canal paſſes through Lower Reyford, near this town, and conveys many articles of trade to and from it. Here are a large weekly market on Fridays, and ſix fairs annually, beſides two annual marts in ſpring and autumn for the ſale of ſheep and cattle. The town has a well-eſtabliſhed charity ſchool for 30 boys; and a charity, called the feoffees. This is endowed with lands, of about 120l. yearly rent, which is applied towards the relief of decayed tradeſmen. The principal manufactory of this town is common ſlippers; and it is ſuppoſed that there are more made here than in any other town in England. Many females are employed in lace-making. The church is a large handſome building, with a loftу tower, and ornamented with many coſtly monuments. Here is a handſome meeting-houſe for the diſſenters. The parith of Market-end, and hamlet of Kings-end, contain 410 houſes and 1946 inhabitants. Plott's Hiſtory of Oxfordſhire. Camden's Britannia.

BICHE, Biche de Guiane, in *Zoology*, a name aſſigned by one French writer (des March. Voy.) to the *Braſilian maſk* of Pennant, *moſchus Americanus* of Gmelin.

Biche *des Bois* is alſo the name of *cervus Mexicanus* (Gmel.) in Barrer. Fr. équin. 151.

BICHET, a corn meaſure, containing about a Paris *minot*, chiefly uſed in Burgundy and the Lyonnois.

Bichet denotes alſo a certain quantity of land, as much as may be ſown by a bichet of corn.

BICHNI, in *Geography*, a town of Perſia, in the province of Erivan, 30 miles N.N.E. of Erivan.

BICHON, in *Zoology*, the name given by Buffon to *canis melitæus* of Ray.

BICHONNOWY, in *Geography*, a town of Ruſſia, in the government of Mohilef, ſeated on the Dnieper, 32 miles ſouth of Mohilef. N. lat. 53° 20′. E. long. 30° 50′. This is one of the diſtricts of the government, called alſo Staroi Bykhof, or Biechov Starov.

BICINCTA, in *Entomology*, a ſpecies of Apis, deſcribed by Schranck Inſ. Auſtr. It is black and villous; mouth and abdomen gloſſy, with two white belts on the latter. Inhabits Upper Auſtria.

Bicincta, a ſpecies of Vespa, of a black colour, with a ſpotted thorax, and two yellow bands on the abdomen. A ſmall inſect, and inhabits the Cape of Good Hope. Fabricius.

Bicincta, a ſpecies of Tenthredo, with a black body; belts on the abdomen, vent, mouth, and ſhanks yellow. A native of Europe. Fabricius. Abdominal yellow belts two, from which it is ſpecifically named *bicintta*.

Bicincta, a ſpecies of Musca *(Syrphus)*, found in the north of Europe. It is black; antennæ elongated; ſides, dots, and two abdominal belts yellow. Linn. Fn. Suec. &c.

Bicincta, a ſpecies of Scolia, of a black colour, and hairy; abdomen with two yellow bands; wings blueiſh black. A native of America. Fabr. Gmel. &c. This inſect is *ſphex radula* of Sulzer.

BICINIUM, from *bis* and *cano*, *I ſing*, in *Church Muſic*, the ſinging of two, either together or alternately. In which ſenſe, the word ſtands oppoſed to *monody*.

BICKAGER, in *Geography*, a town of Norway, 70 miles S.S.W. of Drontheim.

BICKANEER, Bicaneer, or Beykaneer, a town of Hindooſtan, the capital of a circar or diſtrict of the ſame name in Marwar, the north diviſion of Agimere. This country is ſandy and deſert, and in great want of water. Of this country little is known; it is governed by a rajah, and inhabited by Rajpoots. The town is ſituated about 42 miles weſt of Nagore, and 80 W.N.W. of Agimere. N. lat. 27° 12′. E. long. 74°.

BICKERN *of an Anvil*, the pike, or beak-iron.

BICLINIUM, from *bis* and κλίνη, *bed*, in *Antiquity*, two beds about a table; or, as ſome ſay, rather a bed whereon two perſons lay to eat.

BICKERTON's Island, in *Geography*, a name given by Capt. Edwards, in 1791, to an iſland in the South ſea, near the Friendly iſlands, called by the natives Lattai, and diſcovered by Maurelle in 1781. It conſiſts chiefly of a vaſt conical mountain, the ſummit of which appeared to be burnt, but the ſides were covered with trees; and it is ſurrounded with a lower border, which is very fertile, and affords freſh water. This iſland ſupplies cocoa-nuts and bananas. S. lat. 18° 47′ 20″. W. long. 174° 48′.

BICOCCA, a town of Italy, in the duchy of Milan, near which the French were defeated by the Imperialiſts in 1552; 2 miles N.E. of Milan.

BICOLOR, in *Conchology*, a ſpecies of Donax, with an ovate ſhell marked with elevated ſtriæ, which decuſſate a few tranſverſe ones; rufous, with a white ray on one ſide. Gualt. Gmel. &c.

Bicolor, a ſpecies of Pinna found in the Red ſea. This kind is thin, inflected at the lateral margin; yelloweſh, with black brown rays, and a few longitudinal ſtriæ. Chemnitz. This ſhell is thorny, elongated, with curved ſtriæ at the curved margin; the largeſt end rotundated.

Bicolor, in *Entomology*, a ſpecies of Apis that inhabits Denmark. The thorax villous and ferruginous; abdomen black and immaculate. Fabricius.

Bicolor, is alſo an Indian ſpecies of Apis, of a black colour, with the abdomen hairy; fulvous above, and ſnowy-white beneath. Fabricius. This bears ſome reſemblance to apis centuncularis, but is larger.

Bicolor, a ſpecies of Attelabus found in Europe. It is of a black colour, with the thorax and wing-caſes reddiſh; ſcutel, thighs, and ſhanks at the baſe, and tip black. Linnæus Fn. Suec.

Bicolor, a ſpecies of Buprestis, with pointed wing-caſes, of a braſſy-green colour, with a yellow ſpot; breaſt and abdomen yellow. Fabricius. Inhabits South America.

Bicolor, a ſpecies of Cantharis, of a yellow colour, with half of the wing-caſes blue. Thunberg. Inhabits the Cape of Good Hope.

Bicolor, a ſpecies of Carabus that inhabits North America. It is black above, and ferruginous beneath. Fabricius.

Bicolor, a ſpecies of Cerambyx that inhabits Cayenne. This is ferruginous; thorax with two ſpines and tubercles; wing-caſes beyond the middle, with the abdomen black. Fabricius.

Bicolor, a ſpecies of Chrysomela, of a braſſy-green above, and violaceous beneath. Fabricius. Inhabits Alexandria.

Bicolor, a ſpecies of Cicada *(Cercopis)*, of a griſeous colour, with the upper part of the thorax ſanguineous. Linn. Muſ. Leſk. A native of Europe.

Bicolor, a ſpecies of Cryptocephalus (*Erotylus*). This inſect is of a black colour, and braſſy above. Fabricius. A native of New Holland.

Bicolor, a ſpecies of Curculio found in America. This

This is of a black colour, with a rufous thorax and wing-cases. Fabricius.

Bicolor, a species of Dermestes, of an oblong form and black colour; beneath testaceous; wing-cases striated. Fabricius. Inhabits Germany.

Bicolor, a species of Elater, of a brownish ferruginous colour; head and thorax brown; wing-cases striated. Inhabits Europe. Linn. Mus. Lesk.

Bicolor, a species of Gryllus (*Locusta*,) described by Linnæus. It is griseous, apterous, with the hinder thighs rufous beneath.

Bicolor, an African species of Ichneumon, of a ferruginous colour; tip of the abdomen, breast, and end of the upper wings black. Gmelin.

Bicolor, a species of Lampyris (*Pyrochroa*), of a sanguineous colour, with the posterior end violaceous. Fabricius. This is *Cantharis bicolor* of Amœn. acad. It inhabits America, and has the antennæ flattened.

Bicolor, a species of Leptura, of a pale ferruginous colour, with the eyes, wing-cases, wings, and upper part of the vent black. Swederus Nov. Act. Stockh.

Bicolor, a species of Leptura (*Donacia*) that inhabits Europe. It is of a golden colour, with the upper part of the thorax, and the wing-cases green; the latter striated with impressed dots; posterior thighs dentated. Gmelin, &c.

Bicolor, a species of Lytta, of a testaceous colour; wing-cases black at the tip. Geoffroy. Inhabits France.

Bicolor, a species of Mordella, described by Forster (Nov. Inf.). It is of a black colour; wing-cases testaceous, with the tip and band in the middle black. Very small. Inhabits England.

Bicolor, a species of Nitidula found in Europe. This insect is ferruginous, with black wing-cases, having a ferruginous band at the base, and a spot of the same colour near the apex. Fabricius.

Bicolor, a species of Phalæna (*Bombyx*) found in Saxony. The wings are white, with a large yellow spot, with black marks. Fabricius.

Bicolor, a species of Scarabæus, with the thorax very slightly armed, and on the head a single tubercle; wing-cases black; abdomen rufous. Fabricius.

Bicolor, a species of Silpha, of a brown colour, with rufous legs. Linn. &c. A native of Europe.

Bicolor, a species of Sphex that inhabits New Holland. This is of a black colour; head, abdomen at the tip, and wings yellow; the latter brown at the tip. Gmel. This insect was first described by Fabricius from a specimen in the collection of sir Joseph Banks, under the specific name *bicolorata*.

Bicolor, a species of Staphylinus, of a black colour, with the antennæ, wing-cases, and legs ferruginous. Linn. A native of Europe.

Bicolor, a species of Tenthredo, of a blueish black, with the abdomen and base of the wings yellow; a band of black. Schrank. Inhabits Austria.

Bicolor, a species of Vespa that inhabits China; and in size and appearance resembles the common wasp. It is yellowish; antennæ above, crown, thorax, and vent brown. Fabricius, &c.

Bicolor, in *Ichthyology*, a species of Gobius, found in the Mediterranean sea. It is of a brown colour, with all the fins black. Brün. pisc.

Bicolor, in *Ornithology*, a species of Alcedo, of a green colour, and golden rufous beneath; a black and white waved band on the breast; wings and tail spotted with white. Gmelin. This bird is a native of Cayenne. Buffon calls it *Martin pêcheur vert et roux de Cayenne*; pl. enl.; and Latham the *rufous and green kingfisher*. Length eight inches; bill black; legs reddish; breast of the female not banded.

Bicolor, a species of Fringilla, that inhabits the woods of Jamaica and Bahama islands, and is called by English writers the *Bahama sparrow*. The head and breast are black; back, wings, and tail, greenish. Gmelin. The length of this bird is four inches; its note very monotonous. Brisson calls it *Chloris Bahamensis*; and Buffon *Verdinere*.

Bicolor, a species of Lanius, of a blue colour; white beneath; frontlet black. Linn. &c. This is *Loxia Madagascarina* of Linn. Syst. Nat. edit. 12; *Lanius Madagascariensis cæruleus* of Brisson; *Pie-grieschc bleu de Madagascar* of Buffon; and *Blue shrike* of Latham. It is about six inches and a half in length, and, as the synonyms imply, is a native of Madagascar.

The bill, head, margin of the quill-feathers, two middle tail-feathers, and exterior margin of the four next blue; legs and claws black. Female, sordid white beneath.

Bicolor, a species of Loxia found in the East Indies. Gmelin very briefly describes it as being of a fuscous colour, and red beneath. This is *Fringilla rubra minor* of Brisson; *Brunor* of Buffon; *Little brown bullfinch* of Edwards; and *Orange-breasted grosbeak* of Latham. There is likewise a variety of this kind of a brownish colour, white beneath, and chin inclining to brownish. About three inches and a quarter in length; bill whitish; legs fuscous.

Bicolor, a species of Muscicapa, of a black colour; front, space round the eyes, throat, rump, spurious wings, band on the greater wing-coverts, tip of the tail, and under parts of the body, white. Gmelin. Buffon calls this *Gobe mouche à ventre blanc de Cayenne*; and Edwards and Latham *Black and white fly-catcher*. A variety of this bird is white, except the hind part of the head, and neck, rump, wings, and tail, bill, and legs, which are black. The female is of an uniform grey colour. Inhabits the moist meadows of Guiana.

Bicolor, a species of Picus, called by Latham, after Buffon, the *Encenada woodpecker*; *Epeiche ou pic varié de Encénada*, Buffon. This is varied with greyish and white; head crested, white on the sides; quill-feathers brown, spotted with white. Gmelin, &c.

The length of this beautiful bird is about six inches; bill lead colour; irides white; plumage brownish-grey and white finely blended; above, the colours are intermixed transversely, and beneath in a perpendicular direction; crest on the sides intermixed with crimson; sides of the head white, verging to brown; legs lead colour. The female has no crest, and is entirely brown.

Bicolor, a species of Trochilus, of a smaragdine-golden colour, with the head and throat blue. Gmelin. This is of the middle size, and inhabits Guadaloupe. It is *Colibri* Nr. 2. of Fermin. Surin.; *Saphir-emeraude* of Buffon; and *Sapphire* and *emerald humming-bird* of Latham.

Bicolor, a species of Turdus, of a brown colour, tinged with green; abdomen and vent white. This inhabits the Cape of Good Hope; and is ten inches long. Buffon calls it *Merle brun du cap de bonne espérance*; and Latham the *White-rumped thrush*.

BICOLORA, in *Entomology*, an African species of Phalæna (*Noctua*). Wings yellow, with a broad brown posterior margin.

BICOLORATA, a species of Phalæna (*Geometra*) with the wings blueish and striated; anterior black at the tip, and spotted with white. Inhabits Surinam. Cramer, &c.

Bicolorata, a species of Scarabæus (*Melolontha*) found at the Cape of Good Hope. It is glabrous green, beneath

beneath testaceous, legs tipped with gold. Fabricius, &c.

BICOLORATA, a species of PHALÆNA (*Geometra*) with blackish dentated wings; first pair black at the tips, with white spots. A large insect, and inhabits Surinam. Fa-

BICORDATA, a species of CICADA (*Rumatra*), with black wing-cases, testaceous, and line in the middle, with [illegible] yellow. Scopoli. Inhabits Carniola, on the nettles.

BICORDATUS, in *Natural History*, a species of [illegible], having the crown doubled. Leske apud Klein, [illegible]

BICORNIS, in *Anatomy*, is a name which has been given to some muscles.

BICORNIS, from *bis*, and *cornu*, *horn*, in *Botany*, plants whose anthers have the appearance of two horns. The term Ehrenf. supposes [illegible] order of plants of the Fragmenta Methodi Naturalis of Linnæus.

BICORNIGER, in *Mythology*, an appellation of Bacchus, who is [illegible] represented with horns, as symbols of the rays of the sun, [illegible] of the virtue which he imparts to wine. The Arabians gave this name to Alexander the Great, either to express his having added the eastern to the western empire, or in allusion to medals on which he is represented with horns, under a pretence that he was the son of [illegible]

BICORNIS, MUSCULUS, in *Anatomy*, is an appellation formerly given to those muscles usually denominated Extensores carpi radiales; which see.

BICORNIS, or *Tricornis pollicis manus*, are terms formerly applied to designate the three exterior muscles of the thumb.

BICORNIS, in *Entomology*, a species of SCARABÆUS, with two horns on the thorax; a recurved, single-toothed horn on the head, and rufous wing-cases. Aubert. Jablonsky. Inhabits South America; of a middle size among the horned kind of Scarabæi.

BICORNIS, a species of HIDPA, with pectinated antennæ; thorax and wing-cases brassy-green; head two-horned. Inhabits North America. Fabricius.

BICORNIS, a species of CURCULIO, with acutely dentated thighs, and two teeth on the head. Fabricius. Inhabits New Zealand, and is varied with brown and cinereous.

BICORNIS, a species of CASSIDA that inhabits South America. It is of a cyaneous blue colour, with a truncated spine on the anterior angle of the wing-cases. Linn. Fabr. &c.

BICORNIS, a species of MANTIS, found in South America, and it is said also in India. The thorax is smooth; head bigarbite and tubulate. Linn. &c. The legs are [illegible]

BICORNIS, a species of APIS, with two horns in front; head black; abdomen bifasciate and rufous. A native of Europe. Fabricius.

BICORNIS, a species of ANASSA, with two horns on the abdomen. Linnæus. Found in the woods of Surinam.

BICORNIS, in *Natural History*, a species of PLANARIA, [illegible] body obtuse at both ends, of a greyish white colour, dotted with black; and two very short divergent tubes on the tail-part. Gmelin. This is *Fasciola punctata* of Müller.

BICORNIS, a species of ACTINIA, found in the North sea. The disc is semi-spherical-oval, and glabrous with two horns. Müll. Zool. Dan.

BICORPORLA *figura*, from *bis*, and *corpus*, *body*, in *Astronomy*, those signs of the zodiac which have two bodies, or consist of two figures. Such are gemini, or the twins; also pisces, or sagittarius, consisting of a man and a horse.

BICOSTELLA, in *Entomology*, a species of PHALÆNA (*Tinea*) found in Europe. This is cinereous, with a brown stripe on the anterior wings; feelers advanced; antennæ downy. Linn. Fabr. &c.

BICQUELIY, in *Geography*, a town of France, in the department of the Meurte, and chief place of a canton, in the district of Toul, 1½ league south of Toul.

BICUCULLATA, in *Botany*. See FUMARIA.

BICUSPIDES, *dentes molares*, in *Anatomy*, are the two small grinders, which are next the front teeth. See TEETH.

BIDA COLONIA, BLEEDA, in *Ancient Geography*, a town of Africa, mentioned by Ptolemy, and situated in the interior part of Mauritania Cæsariensis, S.W. of Iconium. See BLEEDA.

BIDACHE, in *Geography*, a town of France, in the department of the Lower Pyrenées, and chief place of a canton, in the district of Uftoritz, 5 leagues east of Bayonne. The town contains 2,017 inhabitants, and the canton 9,706. Its territorial extent is 212½ kilometres, and it has 9 communes. N. lat. 41° 31'. W. long. 10 .

BIDAL, or BIDALE, in our *Ancient Customs*, denotes the invitation of friends to drink ale at some poor man's house, who, in consideration hereof, expects some contribution for his relief. See ALE.

BIDALDI, an ancient kind of foot-soldiers mentioned by the French historians, armed with two darts.

Hence the origin of the word, which seems to be a corruption for "bidardi," or "á binis dardis." They are also called *bidarii*, *bidaus*, *bideaux*, *bidants*, and *pitants*.

BIDASSOA, or VIDASOA, in *Geography*, a river which rises in the Pyrenées, and runs into the bay of Biscay between Andaye and Fontarabia, separating France from Spain. This river was for a long time a subject of dispute between France and Spain, each country laying an exclusive claim to it; but in the 15th century Louis XII. of France, and Ferdinand, king of Spain, agreed, that it should be common between the two nations, and that the duties paid by those who pass from Spain to France should belong to the latter, and of those who pass the contrary way to the former. Buffon observes, that the inhabitants of the environs of this river have ears of an uncommon size.

BIDBURG, a town of the Netherlands, in the duchy of Luxemburg, containing two parish churches, and a convent; 11 leagues N.N.E. of Luxemburg.

BIDDEFORD, or BIDEFORD, an ancient sea-port, market, and borough town of Devonshire, England, is situated near the southern coast on the eastern and west in banks of the river Torridge, which is of considerable breadth here, and at spring tides rises to the height of eighteen feet. The greater part of the town is built on the declivity of a steep eminence, and many of the houses being compiled of timber, brick, cobb, or mud walls, present rather a mean appearance. Bideford does not appear to be noticed in the Domesday survey, but soon after the conquest it was bestowed with Kilkampton in Cornwall, on Richard de Grenville, a Norman knight, who accompanied the conqueror into England, and was ancestor to the illustrious family of the Grenvilles, who for upwards of five hundred years continued proprietors of the lordship. Some of this family have greatly signalized themselves in the public events of England; and the names of two, sir Richard Grenville and sir Bevil Grenville, are honourably noticed in the historical annals of this country. This town, though described as a borough in a

charter of Edward I. and afterwards repreſented in ſeveral parliaments, ſeems to have been greatly reduced at the time when Leland viſited it, for he merely mentions the river and the bridge. Camden, however, ſpeaks of it as "remarkable for its populouſneſs." At the time of the latter antiquary. Bideford aſſumed a commercial conſequence, and carried on ſome trade with America and Newfoundland. Queen Elizabeth granted it a charter of incorporation, which veſted the government in a mayor, five aldermen, ſeven capital burgeſſes- a recorder, town-clerk, and two ſerjeants at mace. By this charter the inhabitants are empowered to hold a weekly market, and three annual fairs. Another charter was however obtained in 1610, which confirmed the former, and granted the townſmen ſome additional powers and liberties. The patronage and reſidence of ſir Richard Granville and ſir Walter Raleigh proved highly favourable to Bideford; for after theſe worthy knights had diſcovered Virginia and Carolina, they returned to, and ſettled here. In the time of the civil wars, the inhabitants of this place declared themſelves very early in favour of the parliament; but their ſucceſs did not prove equal to their zeal, for in attempting to relieve Exeter, they experienced a ſevere and total defeat, and immediately reſigned Bideford, Barnſtaple, and their appendages, to the royaliſts.

In the year 1646, Bideford was ravaged by a plague, which appears to have been occaſioned by the landing of a cargo of Spaniſh wool: an article which at that period conſtituted a principal part of the trade of the town. The credulity and ſuperſtition that characterized the Engliſh in the ſeventeenth century are ſtrikingly exemplified by an occurrence which happened here in 1682. Three poor females were accuſed of witchcraft, and ſo direct and poſitive was the evidence adduced againſt them, at ſeveral examinations before the magiſtrates, that they were committed to Exeter gaol, and ſoon afterwards tried, and executed for their alleged crime.

About the middle of the laſt century, the export trade of Bideford to Newfoundland was ſo conſiderable, that only two other ports in the kingdom employed an equal number of veſſels, and in the export trade only one port excelled it. During the unwiſe adminiſtration, and injurious wars of queen Anne's reign, theſe commercial tranſactions materially ſuffered, and the French privateers obtained ſo many valuable prizes from Bideford bay, that it was emphatically termed the *Golden bay*. The number of veſſels now belonging to this port is almoſt one hundred; theſe vary in burthen from twenty to two hundred and fifty tons, and are chiefly employed in the conveyance of coal and culm; in the exportation of oak bark to Ireland and Scotland; in the herring trade, and in the importation of fiſh from Newfoundland. The quay is conveniently ſituated near the centre of the town, and the body of the water at high tides will bring up veſſels of 500 tons burthen. The chief manufacture of this place is that of coarſe brown earthenware, which is made with clay brought from Fremington near Barnſtaple. The price of this is only two ſhillings and ſixpence per ton. The bridge at Bideford, built of ſtone, conſiſts of twenty-four irregular arches, and was conſtructed about the middle of the fourteenth century. It is 677 feet in length, and was conſtructed at the expence of ſir Theobald Granville, knt. and at the inſtigation of the biſhop of the dioceſe, who granted indulgences to ſuch perſons as gave money in aid of the work. The church, a ſpacious building, was erected in the form of a croſs about the middle of the fourteenth century. A houſe of induſtry has lately been erected here; and a free ſchool, and free grammar ſchool are ranked among the charitable foundations of the town. The market-place is ſpacious, and the town-hall is a large convenient building with two priſons beneath it. In the pariſh of Bideford are 606 houſes and 2987 inhabitants. This town is 211 miles S.W. from London.

Thomas Stucley, a deſcendant of the celebrated chaplain to Oliver Cromwell, was a native of Bideford, and was diſtinguiſhed for many eccentricities of character. John Shebbeare M.D. an author of ſome eminence, was alſo born here in the year 1709.

About five miles eaſt of this town is Tawſtock, the ſeat of ſir Bourchier Wrey, Bart. This place is mentioned by different authors as remarkable for embracing at one view "the beſt manor, beſt manſion, fineſt church, and richeſt rectory in the county." Biſhop's Tawton, near Tawſtock, is ſaid to have been the firſt ſeat of the biſhop of this dioceſe. Watkins's Hiſtory of Bideford. Maton's Tour through the weſtern Counties. Prince's Worthies of Devonſhire. Beauties of England and Wales, vol. iv.

BIDDEFORD, a port of entry and poſt-town of America, in York county, and diſtrict of Mayne, on the ſouth-weſt ſide of Saco river, on the ſea-coaſt, 14 miles S. W. from Portland, 24 N.E. from York, and 105 from Boſton. It contains 1018 inhabitants, and the county-courts are held here and at York. N. lat. 43° 26′. W. long. 70° 25′. The bay of Biddeford lies at the mouth of the river Saco, and has Black point for the N.E. point, and cape Porpoiſe for the S.W. point.

BIDDING, is uſed for proclaiming or notifying; alſo for offering a price for goods put up by auction.

BIDDING *of the beads*, a charge or warning which the pariſh prieſt gave to his pariſhioners at certain ſpecial times, to ſay ſo many pater-noſters, &c. on their beads.

Biſhop Burnet (Hiſt. Ref. vol. ii. p. 20.) has preſerved the form, as it was in uſe before the reformation, which was this: after the preacher had named and opened his text, he called on the people to go to their prayers, telling them what they were to pray for; "Ye ſhall pray (ſays he) for the king, for the pope, for the holy catholic church, &c." When this was done, all the people ſaid their beads in a general ſilence, and the miniſter kneeled down and likewiſe ſaid his: they were to ſay a pater-noſter, an ave-maria, Deus miſereatur noſtri, domine ſalvum fac regem, gloria patri, &c., and then the ſermon proceeded.

BIDDLE, JOHN, in *Biography*, a diſtinguiſhed perſon among the Socinians, and reckeond the father of the Engliſh ſect bearing this denomination, and lately aſſuming that of Unitarians, was born at Wotton-under-Edge in Glouceſterſhire, in 1615; and after a previous grammatical education, in the courſe of which he exhibited ſpecimens of his talents and improvement, admitted, in 1632, a ſtudent of Magdalen-Hall, in the univerſity of Oxford. Here he acquired great reputation for learning and prudence, both as a ſtudent and a tutor: and having taken his degrees of bachelor of arts in 1638, and of maſter of arts in 1641, he was, in this latter year, recommended by the principal perſons in the univerſity to the magiſtrates of Glouceſter, and appointed by them maſter of the free ſchool of St. Mary de Crypt, in that city. In this office he completely anſwered the expectations of his conſtituents, and gave great ſatisfaction to the parents of the young perſons who were entruſted to his care. But he did not long enjoy, without moleſtation, the advantages of this ſituation; for he was led, by a diligent ſtudy of the ſcriptures, to adopt notions that were deemed heretical, concerning the Trinity, and more particularly to deny the deity of the Holy Spirit. Failing to give ſatisfaction to the magiſtrates, before whom he was ſummoned, by his confeſſion in 1644, he drew up a more explicit account and defence

defence of his ſentiments on this ſubject in a tract, entitled "Twelve arguments, drawn out of the ſcriptures, wherein the commonly received opinion touching the deity of the Holy Spirit is clearly and fully refuted." A copy of this treatiſe, which he had ſhewn to ſome of his friends, having been, by the treachery of an acquaintance, delivered to the magiſtrates of the city, and to the parliament committee then reſiding there, he was committed, in December 1645, to the common gaol. He was releaſed, however, on giving ſecurity for his appearance when called for. Six months after he had obtained his liberty, he was ſummoned to appear before the parliament at Weſtminſter, and examined by a committee. As he in their preſence diſclaimed of the commonly received opinion concerning the divinity of the Holy Spirit, he was committed to the cuſtody of one of the officers, and kept in that ſtate of reſtraint for five years. In the mean while, his book, entitled "Twelve arguments, &c." was publiſhed, and being declared blaſphemous againſt the divinity of Chriſt, the houſe, in 1647, ordered it to be burnt by the common hangman. In the following year, the author, perſiſting in his opinions, and avowing his ſenſe of their importance, publiſhed two other tracts of a ſimilar nature; one entitled, "A confeſſion of Faith touching the holy Trinity, according to the ſcripture;" and another entitled, "The teſtimonies of Irenæus, Juſtin Martyr, Tertullian," and of ſeveral other early writers, relating to the ſame ſubject. Theſe books excited an alarm, and were the means of procuring a ſevere ordinance of parliament, iſſued in May 1648, at the ſolicitation of the Aſſembly of divines, who acted in this inſtance in a manner that entails diſgrace on their memory, and denouncing the penalty of death againſt thoſe who held opinions contrary to thoſe that were eſtabliſhed reſpecting the Trinity, and ſome other doctrines, accounted blaſphemies and hereſies; and ſevere penalties on thoſe who differed in leſſer matters. By this infamous and execrable decree the fate of Biddle ſeemed to be inevitable. But he eſcaped in conſequence of a diſſenſion in parliament, ſupported by a party in the army, to whoſe caſe this ordinance would have extended. After the death of the king, the Independents acquired influence, and introduced a kind of general toleration, under which Biddle was allowed to go to Staffordſhire, where he was hoſpitably received by a juſtice of the peace, who, at his death, left him a legacy. From this retired aſylum, however, he was remanded by preſident Bradſhaw to cloſer confinement, in which ſtate he continued for ſeveral years, under an imputation of blaſphemy and hereſy, which deprived him of all ſociety, and reduced him to ſuch lamentable indigence, that his whole ſupport for a conſiderable time was a draught of milk morning and evening. The only divine who viſited him, during this period, was Mr. Peter Gunning, afterwards biſhop of Ely. In theſe circumſtances he obtained temporary relief by being employed in correcting the preſs for a Greek Septuagint, printed in London by Roger Daniel; and in 1651, he regained his liberty by the general act of oblivion, publiſhed by the parliament in this year. Of this liberty he availed himſelf, by inſtituting a Sunday's lecture for reading and expounding the ſcripture, and thus propagating his opinions. The Preſbyterian miniſters were rendered uneaſy by his zeal and ſucceſs, more eſpecially as they could derive no aſſiſtance for reſtraining him from the ſecular power. Not ſatisfied with the opportunities he enjoyed of diſſeminating his ſentiments from the pulpit, and in the intercourſe of private friendſhip, he had again recourſe to the preſs, and in 1654, publiſhed his "Twofold Scripture catechiſm;" one larger and more comprehenſive, and the other more brief, for the uſe of children. For this publication he was called to the bar of Cromwell's parliament, and committed to the Gate-houſe, where he was debarred the uſe of pen and ink, and the acceſs of any viſitor; and his books were alſo ordered to be burnt. Although a bill was brought into parliament for puniſhing him, he obtained his liberty after ſix months' confinement, by due courſe of law. Some time after, he had a diſpute with a baptiſt teacher; in the courſe of which he made uſe of ſome expreſſions, for which he was thrown into Newgate, and tried for his life at the next ſeſſions, on the ordinance above-mentioned. On this occaſion, counſel was at firſt denied him, but afterwards granted, and the trial deferred. In the mean while Cromwell interfered, and diſapproving of this kind of intolerance, contented himſelf at firſt with detaining him in priſon; but afterwards, in order to ſilence the clamours and petitions that were preferred againſt him, baniſhed him for life to St. Mary's caſtle in the iſland of Scilly, aſſigning him an annual ſubſiſtence of 100 crowns. In this place of exile Biddle continued three years, applying himſelf to cloſe ſtudy, and particularly to that of the Apocalypſe. His friends at length prevailed with Cromwell to recal him; and in 1658, as no charge appeared againſt him, he was liberated. He then became paſtor of an independent ſociety in London, and propagated his opinions without moleſtation, till the fear of the preſbyterian parliament aſſembled by Richard Cromwell, and the advice of his friends, induced him to retire into the country. On the diſſolution of that parliament, he returned to his former ſtation. After the reſtoration of Charles II. he withdrew from public ſervice, and exerciſed his miniſtry in private aſſemblies with his ſelect friends. However, in June 1662, their meeting was diſcovered, and both he and his friends were apprehended and committed to priſon; and at length, by proceſs of law, each of his hearers was fined 20l. and Biddle himſelf 100l.; and they were ordered to remain in priſon till theſe fines were paid. The cloſe confinement and foul air of a priſon, within five weeks, brought upon him a diſtemper, which terminated his life, September 22, 1662, in the 47th year of his age: and thus was his death haſtened by the intolerance which perſecuted him during the greateſt part of his life. Mr. Biddle poſſeſſed a conſiderable degree of learning; and with the Scriptures he was ſo converſant, that he could repeat the New Teſtament from memory, both in Engliſh and in Greek, as far as the 4th chapter of the revelation of St. John. He poſſeſſed alſo, with this retentiveneſs of memory, powers of reaſoning, which eminently qualified him for diſſeminating his peculiar opinions, and gaining proſelytes. In his private character he was diſtinguiſhed by his piety and devotion, by his moderation and temperance, by his condeſcenſion and benevolence, and by his irreproachable virtue. As he differed in ſome reſpects from Socinus and the foreign Unitarians, his followers were for ſome time denominated "Biddellians;" but the name did not ſubſiſt after his death. Biog. Brit. Toulmin's Life of Biddle, in Unitarian tracts, vol. iv. 1791. Neal's Hiſt. of the Puritans, vol. ii. p. 470, 410.

BIDDLES, in *Geography*, a ſettlement on a branch of Licking river, in Bourbon county, Kentucky, about 6 miles N.W. from Millers on the N.E. ſide of the ſame branch, and 32 miles N.N.E. from Lexington.

BIDENS, ſo named from the ſeed being terminated with two teeth or awns, in *Botany*. Lin. gen. n. 932. Reich. n. 1012. Schreb. 1267. Tournef. t. 262. Juſſ. 188. Dill. Elth. 43. 47. Gærtn. t. 167. Ceratocephalus. Vaill. Act. Gall. 1720. f. 47, 48, 49. Claſs, *ſyngeneſia polygamia æqualis*. Nat. Ord. *compoſitæ oppoſitifoliæ. Corymbiferæ*, Juſſ. Gen. Char. *Calyx* common, imbricate, erect; leaflets often equal,

equal, oblong, channelled, concave. *Cor.* compound, uniform, tubular; corollules hermaphrodite, tubular. Proper. one-petalled, funnel-form; border five-cleft, erect. *Stam.* filaments five, capillary, very short; anther cylindric, tubular. *Pist.* germ oblong; style simple, the length of the stamens; stigmas two, oblong, reflex. *Per.* none: *calyx* unchanged. *Seeds* solitary, obtuse, angular; down with two or more awns, oblong, straight, acute, rough-hooked backwards. *Rec.* flat, chaffy; chaffs deciduous, flattish. *Obs.* In most of the species an expanding five-leaved calycle surrounds the compound flowers. *Verbesina* differs from *Bidens* only in having a ray. Sometimes the corolla has one or two radial florets. Reich.

Ess. char. *Cal.* imbricate. *Cor.* sometimes but seldom with a floscule or two in the ray. *Seed* crowned with erect, scabrous awns. *Recept.* chaffy.

Species 1. B. *tripartita*, trifid water-hemp-agrimony, or bur-marygold. Lin. sp. pl. 1165. Hudf. 355. With. 706. Hull. 181. Relh. 308. Sibth. 248. Abbot. 177. Curt. Lond. fasc. 4. t. 57. Smith. Fl. Brit. 357. 1. Verbesina seu cannabina aquatica, flore minus pulchro, elatior et magis frequens. Raii Synop. 187. Eupatorium cannabinum fœmina. Ger. em. 711. B. Conyza palustris, fol. tripartito divisis. Loes. pruss. 53. ic. 10. "Leaves trifid, calyxes somewhat leafy, seeds erect." Root annual; stem from one to three feet high, with opposite, reddish branches, patent, leafy, obtusely quadrangular, furrowed and smooth; leaves opposite, smooth, deep serrate, trifid or quinquefid: flowers terminating, solitary, somewhat erect, with undivided patent leaves; leaflets of the calyx unequal, plane, smooth, streaked with brown; the floscules uniform, tubulose, yellow; seeds compressed, two or three angled, the angles backward rough, two or three awns, terminating, somewhat erect, yellow, three-cornered, prickly backward; the chaffs of the receptacle resembling the leaflets of the calyx, but narrower. It is frequent in places inundated, and on the brinks of ditches: flowers in August and September. This plant dyes a deep yellow; for which purpose the thread or yarn must be first steeped in alum water, then dried and steeped in a decoction of the plant, and afterwards boiled in the decoction. As by a chemical analysis it is found to possess much the same qualities as verbesina acmella, it may probably have the same good effects in expelling the stone and gravel. 2. B. *minima*, nodding bur-marygold. Lin. sp. pl. 1165. Reich. 3, 703. Hudf. ed. 1. 310. Fl. Dan. t. 312. Abbot. 178. With. 883. γ. Curt. Lond. 3. 55. B. tripartita. β. Hudf. 355. B. Cernua. γ. Smith. Fl. Br. 357. Verbesina minima. Dill. in Rai Syn. 188. t. 7. f. 2. Giff. 167. App. 66. "Leaves lanceolate sessile; flowers and seeds erect." This was first marked by Dillenius for a distinct species. Haller thought it to be no more than a variety of the *cernua*, in which he has been followed by all our British botanists. Found in dried marshes. 3. B. *nodiflora*, sessile-flowered bidens. Lin. spec. 1165. Dill. elth. t. 44. f. 52. Reich. 3. 704. "Leaves oblong, quite entire, one-toothed, stem dichotomous, flowers solitary, sessile." An annual plant, rising with stems eight or nine inches high, rou dish, rough, with white hairs, purple at the base. A native of the East Indies; cultivated at Eltham by Dr. Sherard, in 1732. 4. B. *tenella*. Lin. Spec. 1166. Reich. 3. 704. Amoen. 6. afr. 47. "Leaves linear, peduncles capillary, calyxes mostly four-leaved, seeds erect, five-fold." Stem filiform, purplish, subtrichotomous, six or seven inches in height. An annual, and a native of the Cape of Good Hope. 5. B. *cernua*, drooping water-hemp-agrimony, or bur-marygold. Sp. pl. 1165. Hudf. 356. With. 705. Hall. 181. Relh. 309. Sibth. 248. Abbot. 177. Curt. Lond. fasc. 3. t. 55. Fl. Dan. t. 841. Smith. Fl. Brit. 357. 2. Pet. herb. t. 20. f. 6. Raii hist. 361. n. 2. 3. Verbesina pulchriore flore luteo. Raii syn. 187. Bauh. hist. v. 2. 1074. Coreopsis bidens. Sp pl. 1281. Chrysanthemum cannabinum bidens, foliis integris. Morif. hist. t. 6. t. 5. f. 22. Eupatorium cannabinum chrysanthemum. Barrel. ic. t. 1209. Conyza palustris, foliis serratis. Loes. pruss. 54. t. 11. "Leaves lanceolate, stem clasping, flowers nodding, seeds erect." Root annual; stem from one to two feet high, or more, upright, branched, a little hairy, purplish, dotted with red, round at bottom, striated at top, with branches opposite, nearly upright, leaves opposite, moderately connate, undivided, or with distant serratures, spreading, smooth on both sides; peduncles striated; flowers yellowish-green, finally drooping, generally radiate; calyx consisting of about seven leaves, finely serrate at the edge, ribbed, turning back, and longer than the corrolla; with eight corollets in the circumference, hermaphrodite, like the central ones, but with the tube more tumid and depressed. In places overflowed for a long time, they change into ligulate neutral corollets; receptacle pyramidal, four-cornered; seeds with four awns, two of which are larger; the prickles pointing downwards. This flowers a month later than the *tripartita*; and in this state has a strong smell, not very disagreeable. A native of most parts of Europe. Haller observes, that *coreopsis bidens* of Linnæus differs in no respect from B. *cernua*, except in having radiate florets in the circumference: hence Dr. Stokes concludes, that *bidens* and *coreopsis* form one genus. Found at Ditchingham in Norfolk, and Tarporley in Cheshire; frequent in Ireland. 6. B. *frondosa*, smooth-stalked bidens. Linn. Spec. 1166. Gærtn. fruct. 2. 412. Reich. 3. 704. Berkh. diss. t. 5. f. 5. Chrysanthemum, &c. Mor. hist. 3. 17. f. 6. t. 5. f. 20. "Leaves pinnate, serrate, marked with lines, smooth; seeds erect; calyxes leafy; stem polished." The stem rises about three feet high, sending out many horizontal branches, from the ends of which are produced clusters of yellow flowers. It grows naturally in Virginia, Maryland, and Canada, where it is often a troublesome weed. It was cultivated by Mr. Miller in 1752. 7. B. *pilosa*, hairy bidens, Lin. Spec. 1166. Syst. 732. Reich. 3. 705. Dill. elth. t. 43. f. 51. Thunb. jap. 307. Lour. cochin. 488. Gærtn. fruct. 2. 412. β. B. Chinensis. Agrimonia Molucca. Rumph. Amb. 6. 38. t. 15. f. 2. "Leaves pinnate, somewhat hairy, stem with bearded joints, calyxes with a simple involucre, seeds diverging." A native of America, and of Tongataboo in the South Seas. B. of China resembles the American; but in the latter the leaflets are united, in the former they are distinct; and the seeds of the American have from two to five awns, and in the Chinese always four. The American sort was cultivated in 1732 by Dr. Sherard. 8. B. *bipinnata*, hemlock-leaved bidens. Lin. Spec. 1166. Reich. 3. 705. Lour. cochinch. 488. Chrysanthemum. Herm. par. t. 123. Mor. hist. 17. n. 24. f. 6. t. 7. f. 23. "Leaves bipinnate, gashed, calyxes involucred, corollas half-radiated, seeds diverging." An annual plant; a native of Virginia; cultivated in Kew garden in 1699. Loureiro says it is a native of China and Cochinchina. 9. B. *nivea*, snowy bidens. Lin. Spec. 1167. Reich. 3. 706. Dill. elth. t. 47. f. 55. Swartz obs. 296. β. Dill. elth. t. 47. f. 55. 3. γ. Dill. elth. t. 46. f. 54. "Leaves simple, cordate-ovate, acuminate, branches trichotomous, serrate, flowers hemispherical, peduncles elongated." A native of Jamaica, in elevated pastures, and on the sea-coast of the southern parts. Mr. Miller says, it grows naturally in South Carolina, and also at Campeachy; cultivated at Eltham in

1732, by Dr. Sherard. 10. B. *verticillata*. Lin. Spec. 1167. Reich. 3. 706. Hort. cliff. 399. 4. "Leaves oblong, entire, lower ones entire, upper ones opposite, flowers verticillated." A native of Vera Cruz in South America. 11. B. *frondosa*. Lin. Spec. 1167. Reich. 3. 706. Hort. cliff. 399. 5. Swartz obs. 297. Brown jam. 317. 2. B. frutescens. Mill. dict. n. 4. "Leaves opposite, ovate, acuminate, serrate, stem climbing, shrubby, flowers paniced, ovate." A native of Jamaica, on the cooler mountains, and of Vera Cruz. Miller received it from Carthagena in New Spain. 12. B. *bipinna*, various-leaved bidens. Lin. Spec. 1167. Reich. 3. 706. Ard. Spec. 2. 37. t. 18. Mich. flor. 122. Hall. goit. 385. "Leaves ovate, serrate, lower ones opposite, upper ones ternate, the middle larger." A native of America; found wild in Italy; cultivated by Miller in 1759; annual. 13. B. *Nigrita*. Swartz prodr. 110. Sloan. jam. 1. 257. Eupatorium. "Leaves opposite, ovate-lanceolate, entire, tomentose-hirsute, stem-climbing, shrubby, peduncles opposite, diverging, many-flowered." A native of Jamaica; annual. 14. B. *chinensis*. Cavanilles. 9. n. 12. t. 15. "Stem four-cornered, branchy, very much, leaves cuneate, bipinnate, pinnules wedge-shaped, smooth, seeds rugged." A native of Mexico; flowered at Madrid in November 1791.

Most of the species are herbaceous annuals; some, however, are shrubs; leaves generally opposite, some pinnate; flowers axillary or terminative.

Propagation and Culture. The first, second, and fifth, being common weeds in many parts of Europe, are seldom cultivated in our gardens, but readily propagate themselves by seeds, in wet situations. The third, fourth, seventh, and twelfth, must be sown upon a moderate hot-bed in the spring, and afterwards treated like other hardy annual plants, planting them into the full ground the latter end of May. They will flower in June; soon afterwards the plants will decay. The sixth and eighth are easily propagated by seeds sown, in the spring, in an open situation; where, if they be allowed to lie ripe, the plants will come up the following spring, and two or three of them may be planted where they are to grow; and after they are rooted, they will require no farther care. Being annual plants, they decay soon after the seeds are ripe. The ninth, tenth, eleventh, thirteenth, and fourteenth species are propagated also by seeds, sown on a hot-bed in the spring; and when the plants are fit to transplant, they must be each planted into a separate small pot, plunged into a fresh hot-bed, and treated like other tender plants from the four hot countries. In autumn they must be placed in the bark-stove. Properly managed they will most of them flower this year.

[illegible] TIUM, VARIEGATUM, and ZEYLA.

Bidens, in *Conchology*, a species of MYTILUS, with a striated and slightly convex shell, having the posterior margin indented, and the hinge at the end bidentated. Gmelin. A native of the Mediterranean, Ethiopic, Atlantic, and Mexican Seas. The colour of this shell under the epidermis is blue or blue, about an inch in length, and striated longitudinally.

Bidens, a species of MYTILUS, with a smooth shell, and inner lip bidentated. Chem. Mus. Lad. Ulr. Country unknown. This shell is black or reddish, with obtuse sides, and the size of a pea. Sometimes it is yellow, clouded with white, with three black bands.

Bidens, in *Entomology*, a species of CICADA, found in America. The head and thorax are hoary-green and downy: wing-cases tubercular, spotted with green. Fabricius.

BIDENS, a species of CASSIDA, of a black colour. Wing-cases perforated in front, with an erect spine on the future of each. This is of a large size, and is an inhabitant of Brazil.

BIDENS, a species of CURCULIO, that inhabits New Zealand. It is black; posterior thighs dentated, with a single spine on each of the wing-cases. Fabricius.

BIDENS, a species of CERAMBYX (*Lamia*), found in New Holland, and described by Fabricius. It is grifeous; thorax acutely spined; wing-cases bidentated at the tip.

BIDENS, a species of MANTIS, that inhabits America. The thorax is scabrous; wing-cases green, fasciated with black; wings brown, deep black in the disk.

BIDENS, a species of CIMEX (*Spinosus*), the thorax of which is obtusely spinous; inner and posterior margin, and bidentated vent, sanguineous; wing-cases pale. A native of Europe. Lion. and Gmelin. There is also another species in this section, described by Linnæus and Gmelin, under the name of bidens. It is of an ovate shape, and grifeous, with the thorax acutely spined, and the antennæ rufous. This inhabits Europe.

BIDENS, a species of SPHEX, of a black colour, having the head and antennæ ferruginous; four yellow spots on the abdomen, and two spines on the thorax. Gmelin. Inhabits Mauritania. Mouth and first joint of the antennæ black; anterior wings pale ferruginous; posterior ones large, transparent and bluish.

BIDENS, a species of VESPA, of a black colour, with two spines on the thorax, and third segment of the abdomen, with a yellow margin. Fabricius. It inhabits the north of Europe.

BIDENS, a species of FORMICA, that inhabits Surinam. Thorax with a bidentated tubercle; head ovate; antennæ ferruginous; lower joint black. Fabricius. Sp. Inf.

BIDENTAL, in *Antiquity*, a place struck with a thunderbolt, and on that account consecrated to the gods, and to Jupiter in particular, and forbidden to be trod on, and to remove its bounds was deemed sacrilege. Bidental only differed from puteal, as in the latter, the thunderbolt was supposed to be hidden or buried with ceremony under the ground. The fall of lightning, or a thunderbolt, on any place, was judged by the Romans an indication that Jupiter demanded it for himself. Hence, they surrounded it with a wall, rail, flakes, or even a rope; and expiated it, by the sacrifice of a bidens, or sheep of two years old. Festus represents the bidental as a temple, where sheep of two years old were offered in sacrifice. But by temple, he here means no more than a place inclosed, and consecrated to the gods. The appellation was extended to thunder itself, and to persons destroyed by it.

BIDENTALES, priests among the ancient Romans, instituted for the performance of the ceremonies of a bidental. The bidentes constituted a college, or decury, who had the service and procuration, or interpretation of thunder and lightning. The sheep, and principal part of their office was, the sacrificing a sheep of two years old, which, in their language, was called bidens, as being only two teeth, one on each side; or rather from bidens, anciently written for biennis, two years old.

BIDENTATA, in *Conchology*, a species of HELIX, found in the Indian Sea at Madagascar, and figured by Chemnitz. The shell is perforated, lenticular, carinated, banded, and very finely striated, within reflected, bidentated lip.

BIDENTATA, in *Entomology*, a species of ATTA (*Andrenae*), that

that inhabits America. The abdomen is brown, with five whitiſh belts; vent bidentated. Fabricius.

Bidentata, a ſpecies of Phalæna (*Noctua*). This is a native of Europe, and has brown wings; ſtigmate ſpot on the firſt wings, and inner margin white; a bidentated ſtreak in the middle. Lin. Muſ. Leſk.

Bidentata, a ſpecies of Chrysis, that inhabits Europe. This inſect is glabrous; ſhining blue; thorax armed with two teeth, and with the two firſt ſegments of the abdomen golden. Fabricius. At the vent are three very ſhort teeth.

BIDENTATUS, a ſpecies of Bostrichus, deſcribed by Fabricius, Herbſt, &c. It is black, and teſtaceous, retuſe at the extremity, and armed with two hooked ſpines.

Bidentatus, a ſpecies of Cryptocephalus (*Crioceris*), of a yellow colour; wing-caſes black, yelloviſh at the tip. Fabricius. Inhabits Africa.

Bidentatus, a ſpecies of Cerambyx, that inhabits South America. The thorax is ſlightly ſpinous; wing-caſes bidentated, rough, cinereous, and brown. Fabricius.

Bidentatus, a ſpecies of Ichneumon, that inhabits Europe. It is black, ſcutel, and poſterior part of the thorax yellow; on the latter two teeth, and the two firſt ſegments of the abdomen ferruginous. Linn. &c. The four anterior legs are rufous brown; reſt black; tips white.

Bidentatus, a ſpecies of Cimex (*Spinoſus*), found in France. This is long and brown; ſnout bent; thorax beneath armed with two teeth on the anterior part. Geoffroy, Gmelin.

Bidentatus, a ſpecies of Tabanus, that inhabits Auſtria. This is of a ferruginous colour, with two yellow ſpots on each ſides, and ſcutel bidentated. Fabricius.

BIDENTES, in *Middle Age Writers*, denote two yearlings, or ſheep of the ſecond year. The wool of theſe bidentes, or two year old ſheep, being the firſt ſheering, was ſometimes claimed as a heriot to the king, on the death of an abbot. Among the ancient Romans, the word was extended farther to any ſort of beaſts uſed for victuals, eſpecially thoſe of that age, whence we meet with *ſues bidentes*.

BIDENTI *Similis*, in *Botany*. See Siegesbeckia.

BIDET, a nag, or little horſe, formerly allowed each trooper and dragoon, for his baggage, and other occaſions. Bidets are now diſuſed, on account of the expences of them, and the diſorders frequently ariſing from thoſe who attended on them, &c.

BIDETTO, in *Geography*, a town of Italy, in the kingdom of Naples, and country of Bari, the ſee of a biſhop, ſuffragan of Bari; 118 miles eaſt of Naples.

BIDGOST, or Bigodsez, a town of Pruſſia, in Pomerelia, 64 miles ſouth of Dantzick.

BIDIÆI, in *Antiquity*, an order of magiſtrates at Sparta, five in number, whoſe buſineſs it was to ſuperintend the *ephebi*, and be preſent at their exerciſes, wreſtlings, &c.

BIDI-BIDI, in *Ornithology*, one of the ſynonymous names of the Jamaica rail, *rallus Jamaicenſis* of Latham.

BIDJIGUR, in *Geography*, a town of Hindoollan, in the country of Benares, ſeated on the river Soane, 45 miles ſouth of Benares, and 128 S.W. of Patna. N. lat. 24° 30′. E. long. 83° 26′.

BIDIN. See Widin.

BIDIS, in *Ancient Geography*, now *S. Giovanni de Bidini*, a town of Sicily, ſouth-weſt of Syracuſe, and about 15 miles from it. It is mentioned by Cicero, and alſo by Steph. Byz. who calls it *Bidos*. The people who inhabited the eaſtern part of the iſland, at ſome diſtance from Syracuſe, were hence called *Bidini*.

BIDLOO, Godfrey, in *Biography*, a celebrated Dutch anatomiſt, born at Amſterdam, 1649, applied early to the ſtudy of ſurgery, which he practiſed ſeveral years at his native city; he was alſo ſurgeon to the army, and at length phyſician to William III. with whom he continued in great favour to the time of his death, which happened in 1702. In 1694, he was made profeſſor of anatomy and ſurgery at Leyden. He was a man of conſiderable learning, Haller ſays, but more attached to the pleaſures of the table than to ſtudy, to which he attributes the numerous errors and inaccuracies in his otherwiſe ſplendid and valuable anatomical tables, which were criticiſed, perhaps, with too much ſeverity by Ruyſch, who had been his pupil. Our countryman, William Cowper, purchaſed 300 copies of the plates, in the life-time of Bidloo, and publiſhed them as his own, only giving new explanations, of which our author, with reaſon, complained in his "Gulielmus Cowper citatus coram tribunal," Leyden, 1700, 4to. Beſides his great anatomical work, conſiſting of 105 tables, with explanations, fol. 1685, and his controverſial papers, he publiſhed, "Obſervationes de animalculis in hepate ovillo detectis," 1698, 4to. "De oculis et viſu variorum animalium," 1712, 4to. "Exercitationes anatomico-chirurgicæ," 1780, 4to. Theſe, with various other diſſertations, were collected, and publiſhed in 1715, 4to. two years after his death. Haller. Bib. Anat. Chirurg. et Med. His nephew, Nicholas Bidloo, was phyſician to the great czar Peter I.

BIDON, a liquid meaſure of about five quarts Engliſh meaſure; ſeldom uſed except among ſhip's crews.

BIDOURLE, in *Geography*, a river of France, which paſſes by S. Hippolyte, Sauve, Sommieres, &c. and runs into the lake of Peraut, 3 leagues eaſt of Montpellier.

BIDOUZE, a river of France, which runs into the Adour, near the junction of that river with the gaves of Pace and Oleron.

BIDUMI, a country of Aſiatic Turkey, the ſouth part of Syria, bounded on the north by Paleſtine, on the weſt by Egypt, and on the eaſt and ſouth by Arabia; it is nearly deſert, and has only a few ſcattered villages.

BIE, Adrian de, in *Biography*, a painter of portraits and ornamental architecture, was born at Liere, in 1594, and after being initiated in the rudiments of his art by Wouter Abts, became the diſciple of Rodolph Schoof, a painter of conſiderable reputation at Paris. He perfected himſelf at Rome, where he ſpent ſix years in the ſtudy of the beſt maſters, and received great encouragement from perſons of the firſt diſtinction. He ſo much excelled in the neatneſs of his pencilling, and in the delicacy of his touch and colouring, that he was frequently employed to paint on jaſper, agate, porphyry, and other precious materials. The place and time of his death are not aſcertained. Pilkington. See Bye.

BIEBER, in *Geography*, a town of Germany, in the circle of the Upper Rhine, and county of Hanau Munzenberg, 16 miles eaſt of Hanau. Near this town are a mine of copper and ſilver, and ſome works of iron and cobalt, in which the latter is prepared into a beautiful ſmalt.

BIEBERICH, a ſmall but handſome town of Germany, ſeated on the borders of the Rhine, and in the vicinity of Mentz. It belongs to a prince of the ſame name.

BIEBERSBACH, a town of Germany, in the circle of Franconia, and principality of Bayreuth.

BIEBRA, a river of Poland, which runs into the Narew, near Wiezna, in Maſovia.

BIECZ, a town of Poland, in the palatinate of Cracow, ſeated on the river Waſaloke, and famous for its mines of vitriol. N. lat. 49° 50′. E. long. 21° 40′.

BIEDA, a town of Italy, in the ſtate of the church, and province of Patrimonio, 10 miles W. of Sutri.

BIEDBURG, anciently *Beda*, a ſmall town of Germany, in the circle of Burgundy, and duchy of Luxemburg, which was flouriſhing till the year 1663, but ſoon afterwards laid waſte by the French.

BIEDENKOPF, or Biedencap, a ſmall town of Germany, in the circle of the Upper Rhine, and principality of Upper Heſſe, ſeated on the Ahills, 16 miles N.W. of Marburg, and formerly famous for its iron works and foundery.

BIEFVERSKOW, a diſtrict of Zealand, belonging to Denmark, including 12 churches.

BIEKA, Bieque, Boriquen, or Crab's *iſland*, one of the Virgin iſlands in the Weſt Indies, about 23 miles in length, and not 6 in breadth, where it is wideſt. It is diſtant about 6 miles S.S.E. from Porto Rico. The ſoil is rich, and it has a good road on the ſouth ſide, called Great Harbour. It is claimed by the Spaniards, whoſe intereſt it is to let it remain deſolate. N. lat. 18° 2'. W. long. 64°. See Virgin *Iſlands*.

BIEKOW, or Jezow, a town of Poland, in the palatinate of Lenczicz, 24 miles S.E. of Lenczicz.

BIEL, a town of Spain, in Aragon, 6 leagues S.W. of Jaca.—Alſo, a river of Spain, which joins the Ores at Exea. See Bienne.

BIELA, a town of Bohemia, in the circle of Czaſlau, 6 miles N.E. of Teutſch Brod.

BIELA, or Biella, a town of Italy, in Piedmont; the capital of a ſmall country, bounded on the north by the Alps, on the weſt by the duchy of Aoſta, on the eaſt by the Vercellois and the Maſſeran, and on the ſouth by the Canavez; the town is rich and populous, containing about 7000 inhabitants, and is divided into the Upper and Lower, and has four churches and four monaſteries. It is famous for an image of the Virgin Mary; diſtant 13 miles N. from Ivrea, and 24 N. W. from Vercelli. N. lat. 45° 22'. E. long. 8° 3'.

BIELACH, a river of Germany, in the archduchy of Auſtria, which runs into the Danube, near Melck.

BIELAIA, a river of Ruſſia, which riſes in the Uralian mountains, and after traverſing the government of Ufa, diſcharges itſelf into the Kama, on the borders of the government of Caſan.

BIELASTENA, a town of Croatia, 10 miles north of Bihacs.

BIELAY, a town of Bohemia, in the circle of Koningratz, 4 miles S. W. of Branau.

BIELBSKOI, a town of Siberia, 40 miles ſouth of Eniſeiſk.

BIELCOPOL, a town of Poland, in the palatinate of Kiov, 48 miles weſt of Bialacerkiew.

BIELEF, a town and diſtrict of Ruſſia, in the government of Tula, ſeated on the Occa, 50 miles W.S.W. of Tula.

BIELEFELD, a town of Germany, in the circle of Weſtphalia, and county of Ravenſberg, divided by the Lutterbach into the old and new town, ſeated at the foot of a mountain, and containing about 800 houſes. The inhabitants are partly Lutherans, and partly Roman Catholics. The old town has two churches, the new a convent and a chapel. This town received municipal privileges in 1287, and was formerly Hanſeatic; it is diſtant 22 miles north from Lippſtadt.

BIELGOROD, a town formerly called *Sarkel*, and diſtrict of Ruſſia, in the government of Kurſk, ſeated on the Donetz; 50 miles S.S.W. from Kurſk. N. lat. 50° 55'. E. long. 36°. This town was built in 990, by the great duke Wladimir, and is an archbiſhop's ſee; it ſubmitted to the arms of Potemkin, in 1790.

Bielgorod. See Akerman and Moscow.

BIELGRAD, a town of Croatia, 40 miles S. E. of Bihacs.

BIELIAN, a town of Ruſſian Tartary. N. lat. 43° 20'. E. long. 66° 4'.

BIELICA, or Bilizin, a town of Lithuania, in the province of Vilna, ſeated on the Niemen, 10 miles ſouth of Lida. N. lat. 53 35'. E. long. 25° 40'.

BIELISKI, a town of Poland, in the palatinate of Kioſ, 41 miles S.W. of Kioſ.

BIELITZY. See Belitzy.

BIELLA. See Biela.

BIELLE, a town of France, in the department of the Upper Marne, and chief place of a canton, in the diſtrict of Chaumont, 6 miles E.S.E. of Chaumont.—Alſo, a town of France, in the department of the Lower Pyrenées, and chief place of a canton, in the diſtrict of Oleron, 14 miles ſouth of Oleron.

BIELOI, a town and diſtrict of Ruſſia, in the government of Smolenſko, on the ſmall river Vobiſha, falling into the Meſha or Meza, which diſcharges itſelf into the Duna; 50 miles N.N.E. of Smolenſko. N. lat. 55° 40'. E. long. 34°. —Alſo, an iſland in the Karſkoi ſea, about 70 miles in circumference, 20 miles from the continent of Ruſſia. N. lat. 73° 40'. E. long 69° 14'.

BIELOKAMESKOI, a fortreſs of Ruſſia, in Siberia, on the eaſt ſide of the Irtiſh, 12 miles S.E. of Semipolatnoi.

BIELO-OZERO, or White Lake, a lake of Ruſſia, in the government of Novgorod, about 50 verſts long, and 30 broad, which receives into it ſeveral ſmall ſtreams. The only one that flows out of it, is the Shekſna, which falls into the Volga. The water of this lake is clear, having a bottom partly of clay, and partly of ſtone. The clay is generally of a white colour, and in ſtormy weather cauſes a ſtrong white foam upon the ſurface of the water. From this circumſtance, the lake firſt obtained its name *Bielo*, or *White*. It contains plenty of fiſh and crabs. N. lat. 59° 42' to 60° 20'. E. long. 36° 30' to 37° 18'.

BIELOPOLIE, a town and diſtrict of Ruſſia, in the government of Karkof, ſeated on a rivulet falling into the Seim, 85 miles N.N.W. of Karkof.

BIELOVITZ, a town of Croatia, 11 miles S.W. of Damianovitz.

BIELOVODSK, a town and diſtrict of Ruſſia, in the government of Voronetz, ſeated on the Derkul, which falls into the Donec, 130 miles ſouth of Voronetz. N. lat. 49° 42'. E. long. 39° 10'.

BIELOW, a town of Poland, in the palatinate of Volhinia, 36 miles eaſt of Lucko.

BIELOZERSK, a town and diſtrict of Ruſſia, in the government of Novgorod, on the ſouth ſide of the lake Bielo-Ozero, near the efflux of the river Shekſna, 64 miles N.E. of Vologda. N. lat. 59° 40'. E. long. 37° 10'.

BIELSA, a town of Spain, in Aragon, 6 leagues from Ainſa.

BIELSK, a town of Poland, and capital of the palatinate of Podalachia, where the dietine for the diſtrict is held. It is little better than a miſerable village, though called in the geographical deſcriptions of Poland, a large town. N. lat. 52° 48'. E. long. 23° 28'.—Alſo, a town of Poland, in the palatinate of Ploczko, 10 miles N. E. of Ploczko.

BIELTSCH, a town of Bohemia, in the circle of Chrudim, 16 miles north of Chrudim.

BIELUGA, in *Zoology*, *Delphinus Leucas* (*Gmelin*) in Steller's Kamptſchatka, &c.

BIENAISE, John, in *Biography*, born in 1601 at Mazeres,

Mazetes, a city in France, where he practiſed ſurgery with ſuch ſucceſs, as to attract the notice of his ſovereign, Lewis XIV., by whom he was made ſurgeon to the army in Flanders. He acquired great reputation, Haller ſays, by introducing the ſuture of the tendon, and by curing a puncture of the brachial artery in a young nobleman. He gives excellent cautions, on taking up the artery, after amputating a limb, to avoid including the nerve in the ligature. He performed the paracenteſis of the thorax ſucceſsfully, and appears to have been a bold and expert operator, and to have made conſiderable improvements in his art. He died 1681, aged 80 years. A few years after his death, viz. in 1688, a poſthumous work was publiſhed, containing an account of theſe operations, under the title of "Operations de Chirurgie, par une methode courte et facile," 12mo. Paris. Haller Bib. Anat. Eloy. Dict. Hiſt.

BIENENBUTTEL, in *Geography*, a town of Germany, in the circle of Lower Saxony, and principality of Lunenburg, 10 miles S.S.E. of Lunenburg.

BIENNE, a ſmall diſtrict of Swiſſerland, lies between a lake of the ſame name and a chain of the Iura mountains. It is ſurrounded by the cantons of Berne and Soleure, the biſhopric of Baſle, and the principality of Neufchatel. The biſhop of Baſle is the ſovereign of this little ſtate, but his power, even before the French revolution, was exceedingly limited; and its conſtitution was neither a limited monarchy nor an independent republic, but a kind of mixed government, partaking in ſome degree of both. The biſhop of Baſle, upon his promotion to the ſee, received the homage of the citizens and militia of the town of Bienne, with attendant tokens of abſolute ſubmiſſion, but at the ſame time he confirmed, in the ſtrongeſt manner, all their privileges and franchiſes. The mayor appointed by him was his repreſentative, to whom it belonged to convoke and preſide in the little council, as the chief court of juſtice, to collect the ſuffrages, and to declare the ſentence; but without giving any vote himſelf. Although juſtice was carried on, and executed in the name of the biſhop, yet neither that prince, nor the mayor, had the prerogative of pardoning criminals, or of mitigating the ſentence. All cauſes, civil and criminal, were brought before the council in the firſt inſtance; and in more important proceedings, an appeal lay to the ſovereign council. In both caſes, each party choſe a member of the council to act as his advocate, which office he diſcharged without fee or recompence. The ſovereign's revenue amounted only to about 300l. a year, nor did he poſſeſs the leaſt ſhare in the adminiſtration. The legiſlative authority reſided in the great and little councils combined: the former conſiſting of 40 members, and the latter, to which the executive power belonged, being compoſed of 24; and it was required that the members of each council ſhould be married men. Both councils elected their reſpective members; and therefore the conſtitution was altogether ariſtocratical. The burgo-maſter, or chief of the regency, was choſen by the two councils, and preſided at their meeting, and retained his office during life; but it was neceſſary that he, as well as the ſeveral magiſtrates, ſhould be confirmed annually by the two councils. The ſalaries annexed to theſe poſts were ſmall, and the general expences of government ſo inconſiderable, that the revenues of the ſtate were ſufficiently ample.

This republic, though a Proteſtant one, under the ſovereignty of a Catholic biſhop, enjoyed in the fulleſt extent the power of impoſing taxes, contracting alliances, declaring war and peace; and, in ſhort, of exerciſing every other act of abſolute and independent legiſlation. Its ſingular conſtitution was guaranteed by Berne, Friburg, and Soleure, with which the town was cloſely allied, having connected itſelf with the former in 1352, with the ſecond in 1496, and with the latter in 1382; in conſequence of which union it became a member of the Helvetic confederacy. This alliance between the cantons and the town of Bienne was paramount to that of the ſame cantons with the biſhop of Baſle: for the town enjoyed the right of ſending deputies to every general diet, ordinary or extraordinary, a privilege not poſſeſſed by the biſhop. The language of the country is a provincial German; but, as the territory borders on the principality of Neufchatel, the inhabitants ſpeak alſo a corrupt French. The extent of the town and territory of Bienne is eſtimated at 144 ſquare geographical miles, and its population at 5,500, or nearly 6000 perſons; the people are very active and induſtrious. Bienne forms an important paſs into the Swiſs territories; accordingly, it was occupied by the French on the 8th of February 1798, and annexed to France as ſubject to the biſhop of Baſle, whoſe rights they aſſumed in conſequence of having ſeized his territories.

BIENNE, called by the Germans *Biel*, the capital of the above diſtrict, is ſituated at the foot of mount Iura, and at a little diſtance from the lake of the ſame name. Between the town and the lake is a plain, which the ſovereign council, by a kind of Agrarian law, that was honourable to the legiſlature, allotted, by diſtinct portions, to each burgher for his own diſtinct uſe: and it is entirely laid out in ſmall k itchen gr-dens. Several manufactures have been eſtabliſhed in the town, which, conſidering its ſize, carries on a tolerable trade. The government, by adopting the liberal policy of conferring the burgherſhip at an eaſy rate, has contributed to increaſe the population of the town, and to extend its commerce. N. lat. 47° 8′. E. long. 1° 4′.

BIENNE, *lake of*, lies to the north-eaſt of that of Neufchatel, with which it is connected by the Thielle, which ſeparates the country of Neufchatel from the canton of Berne. It is about 9 miles long, and 4 broad; its borders are pleaſing and pictureſque, as it is ſkirted with agreeable walks and country houſes; and the town of Nidau forms a very beautiful object upon its eaſtern ſide. Towards the ſouthern extremity of this lake is the iſland of St. Peter, ſometimes called the iſland of La Motte, and ſometimes Rouſſeau's iſland, from its having been the place of Rouſſeau's retirement and reſidence, when by the violence of the populace he was obliged to withdraw from Moitier, where Frederic king of Pruſſia had enſured to him protection. Mr. Coxe, when he viſited this iſland, landed on the ſouth ſide of it, and paſſed through an agreeable meadow, ſkirted with vineyards, to a large farm houſe, formerly a convent, and ſeculariſed at the reformation, but inhabited, at the time of Mr. Coxe's viſit, by the ſteward of the general hoſpital at Berne, to which the iſland belongs. "The iſland," ſays Mr. Coxe, "is about 2 miles in circumference, and richly wooded with various ſhrubs and trees, particularly with large oaks, beech, and Spaniſh cheſnuts. Its ſurface is gently undulating; the ſouthern ſhore, covered with herbage, forms a gradual ſlope to the lake; the remaining borders are ſteep and rocky; in a few places their ſummits are thinly fringed with ſhrubs; in others their perpendicular ſides are clothed to the water's edge with hanging woods. The views from the different parts of the iſland are beautiful and diverſified; that to the north is the moſt extenſive and pleaſing. It commands the lake of Bienne, which is of an oval form: its cultivated borders ſpotted with villages and caſtles, with the towns of Nidau and Bienne ſtanding on the further extremity. Agreeable walks are carried through the woods, and terminate at a circular pavilion placed in the centre of the iſland. During vintage, particularly, and on Sunday, which is the uſual day of feſtivity, the iſland is filled with parties, who take refreſhment at the farm-houſe, ſtray about the woods, or dance in the circular building, and animate theſe romantic but ſolitary ſcenes."

cenes." "Rouſſeau occupied an apartment in the farm-houſe, the only dwelling in the iſland. He lived with the ſteward and his family, who are the preſent inhabitants (1785). The woman informed me, that he paid for his board and lodgings 40 ſhillings a month; that he uſually roſe at ſix, dined with the family at twelve, and after a ſlight ſupper retired to reſt at nine. She added, he was extremely chearful and agreeable; converſed with the family with the greateſt eaſe and complacency, and conformed to their hours and manner of living; he amuſed himſelf entirely in wandering about the woods, and ſearching for plants, which he uſed to explain to them with ſingular ſatisfaction. Rouſſeau mentions his reſidence in this delightful iſland with the higheſt terms of rapture, and with his uſual proneneſs to exaggeration." "I was permitted," ſays he, "to remain only two months in this delightful iſland; but I could have paſſed there two years, two centuries, all eternity, without ſuffering a moment's ennui, although my whole ſociety conſiſted of the ſteward and family, good, but plain people. I eſteem thoſe two months the moſt happy period of my life; and ſo happy, that I could have paſſed my whole exiſtence without even a momentary wiſh for another ſituation." Coxe's Travels in Switzerland, &c. vol. ii. p. 152, &c.

BIENNIAL Plants, in *Botany*, denote ſuch, as the epithet imports, that are of two years' duration. Of this tribe there are numerous plants, which, being raiſed one year from ſeed, generally attain perfection in the ſame year, or within about twelve months, ſhooting up ſtalks, producing flowers, and perfecting ſeeds in the following ſpring or ſummer; and ſoon after commonly periſh, or apparently decay and dwindle, ſo that they ſoon die off. Biennials are, therefore, always in their prime the firſt or ſecond ſummer. They conſiſt both of eſculent and flower plants. Thoſe of the former ſort are the cabbage, ſavoy, carrot, parſnip, beet, onion, leek, &c.; and thoſe of the latter are the Canterbury bell, French honey-ſuckle, wall-flower, ſtock-july-flower, ſweet-william, China-pink, common-pink, matted-pink, carnation, ſcabious, holly-hock, tree-mallow, vervain-mallow, tree-primroſe, honeſty, or moon-wort, &c.

BIENTINA, in *Geography*, a town of Italy, in the duchy of Tuſcany, on the ſide of a lake, called the "lake of Bientina," or the "lake of Seſſo;" which lake is about 6 miles long, and 5 wide; 12 miles eaſt of Piſa, and 28 weſt of Florence. The territory of Bientina lies in the middle of a marſh, in the centre of a valley, not very ſpacious, bounded by the high mountains of Piſa, and by thoſe of Lucca and Valdinievole, which interrupt the wind, and prevent a renewal of air; and it is, therefore, as one would imagine by its ſituation, peculiarly unwholeſome and unfavourable for inhabitants. It is nevertheleſs very populous, and ſufficiently healthful even in ſummer. The principal cauſes of this ſalubrity are ſaid to be, the numerous population, the extenſive commerce, and the extreme attention that is paid to the continual diſcharge of the rain-waters, but, above all, the advantage of an abundant ſpring, which deſcends from the hills of St. Colombe, by means of long aqueducts, and ſupplies the inhabitants with excellent water. The ſituation of Bientina, therefore, duly examined, ſhews how far the art of man is capable of rendering habitable, and even ſalubrious, places naturally peſtilential.

BIENVILLE, D. T. De, M.D. in *Biography*, born in France, practiſed medicine many years at the Hague, and is only known by the following works, which bear his name: "La Nymphomanie, ou Traité de la fureur uterine," Amſt. 1771, 8vo.; "Recherches theoriques et pratiques ſur la Petite verole," 1772, 8vo.; "Traite des erreurs populaires, ſur la ſanté," La Hague, 1775, 8vo.

BIER, a kind of wooden carriage, on which the bodies of the dead are borne to their grave. The word comes from the French *biere*, which ſignifies the ſame. It is called in Latin *feretrum*, *a ferendo*. Among the Romans the common bier, upon which the poorer ſort were carried, was called *ſandapila*; that uſed for the richer ſort, *lectica*, *lectica funebris*, ſometimes *lectus*. The former was only a ſort of wooden cheſt, *vilis arca*, which was burnt with the body: the latter was enriched and gilded for pomp. It was carried bare, or uncovered, when the perſon died a natural and eaſy death; when he was much diſfigured or diſtorted, it was veiled or covered over.

Bier, is more particularly uſed for that on which the bodies of ſaints are placed in the church to reſt, and expoſed to the veneration of the devout. This was often enriched with gold, ſilver, and precious ſtones; and furniſhed temptations, in many inſtances, to pillage.

BIERG, in *Geography*, a herred, or diſtrict, of the dioceſe of Funen in Denmark, including 12 churches, and ſeveral noblemen's ſeats.

BIERLING, Gaspan Theophilus, in *Biography*, took his degree of doctor in medicine at Padua, about the middle of the 17th century, whence he returned to Magdeburg, his native city, where he was in conſiderable eſtimation. He publiſhed "Adverſariorum curioſorum Centuria prima," June, 1679, 4to. He deſcribes the effects of eating the hyoſcyamus (henbane), drowſineſs, and delirium, which are cured, he ſays, by taking the extract of caſtor, and the effects from the bite of a viper, cured by eating the fleſh of one of thoſe reptiles. He had the merit of recommending the cool treatment, and even bleeding, in the ſmall-pox, contrary to the then generally received opinion. For the remainder of his works, which are numerous, but in little eſtimation; ſee Haller's Bib. Med. Eloy. Dict. Hiſt.

BIERNE', in *Geography*, a town of France, in the department of Mayenne, and chief place of a canton, in the diſtrict of Chateau-Gonthier. The place contains 810, and the canton 8225 inhabitants: the territory includes 205 kiliometres and 12 communes.

BIERVLIET, a ſmall town of Flanders, on the weſt ſide of the Scheldt, which has been much reduced by frequent inundations, and the fortifications of which were deſtroyed in 1688. William Beukeljzoon, or, as others have written his name, Beukelings, who taught the Dutch the art of curing herrings, was a native of this place, and died here in 1397. The town is 7 leagues north of Ghent, and 4 E. N. E. of Sluys. N. lat. 51° 25′. E. long. 3° 42′.

BIESBOS, a large lake in the Merwe, between Dort and Gertrudenburg, formed by the irruption of the banks or dykes.

BIESE, a river of Germany, which riſes 8 miles ſouth-weſt from Stendal, in the Old Mark of Brandenburg, and purſuing its courſe to Seehauſen, changes its name to Aland.

BIESENTHAL, a town of Germany, in the circle of Upper Saxony, and Middle Mark of Brandenburg, 20 miles N. E. of Berlin.

BIESIUS, Nicholas, in *Biography*, born at Ghent in Flanders, March 27, 1516, ſtudied medicine at Louvain; thence he went to Valencia in Spain, and afterwards to Sienna, in Italy, where he took his degree of doctor. Returning to Louvain he was advanced to the chair of profeſſor in medicine, which he filled with credit ſeveral years, expounding to his pupils, as the cuſtom then was, the works of Galen. He was thence called by the emperor Maximilian II. to Vienna, and appointed his phyſician, which poſt he held until April 1572, when he was ſuddenly cut off by a fit of apoplexy. His works are, "Theoreticæ Medicinæ, libri ſex," Ant. 1558, 4to.; "In Artem medicam Galeni Commentarii," 1560, 8vo.; "De Methodo Medicinæ," 1564. 8vo.; "De Natura libri quinque," 1573, 8vo.; the two laſt works have been ſeveral times reprinted.

BIESMES, in *Geography*, a place of France, where is a pafs acrofs the Aine, from the department of the Meufe to that of the Marne; 3 miles from St. Menehold, and 12 from Grand Pre.

BIESNIN, a town of Poland, in the palatinate of Ploczko. N. lat. 53°. E. long. 20° 8′.

BIETIGHEIM, a town of Germany, in the duchy of Wurtemberg, at the conflux of the Ens and Metterbach; 10 miles N. of Stutgartd, and 30 S. S. E. of Heidelberg.

BIEVRE, a river of France, which rifes a little to the fouth of Verfailles, and paffing towards Paris, changes its name for that of Gobelins, on account of its water being ufed in that manufacture, and foon after it joins the Seine.

BIEUZI, a town of France, in the department of Morbihan, and chief place of a canton, in the diftrict of Pontivy; 2 leagues S. S. W. of Pontivy.

BIEZOW, or Bidschow, a town of Bohemia, in the circle of Koningingratz; 3 miles eaft of Koningingratz.

BIFARIA, Folia, in *Botany*, denote leaves that point two ways.

BIFASCIANA, in *Entomology*, a fpecies of Phalæna (*Tortrix.*) The anterior wings are teftaceous; two oblique bands, fpot, and arched mark at the apex brown. Linn. Mufe. Lefk, &c. Inhabits Europe.

BIFASCIATA, in *Conchology*, a fpecies of Bulla, the fhell of which is fomewhat tapering, erect, and white, with two broad reddifh bands at the aperture. Lifter. Gmelin. Native place unknown.

Bifasciata, a fpecies of Voluta, defcribed by Lifter and Martini. This fhell is thin, tranfverfely ftriated, and flefh coloured, with two white bands and a fingle tooth on the pillar. It is rather lefs than an inch in length; and has a long narrow aperture. Native country unknown.

Bifasciata, a fpecies of Cypræa, of an oblong form and purplifh, with a ftraw-coloured band, and a narrower white one, a brown border. Gmelin. Length nearly four inches. Country unknown.

Bifasciata, a fpecies of Nerita, of a blackifh colour, with two hoary bands and white tip. A native of India. Gmelin. Chemnitz, &c.

Bifasciata, in *Entomology*, a fpecies of Silpha, found in Saxony. This is black, with two bands and a fpot at the apex of ferruginous colour. Fabricius. This is a fmall infect.

Bifasciata, a fpecies of Cassida, that inhabits South America. It is pale with two brown bands. Gmelin.

Bifasciata, a fpecies of Coccinella, of a ferruginous colour, with two bands and four dots of black. Fabricius. This infect inhabits the cape of Good Hope; and is *Coccinella flexuofa* of Thunberg.

Bifasciata, a fpecies of Chrysomela of a large fize, that is found at Cayenne. It is teftaceous: wing-cafes braffy and fhining: two fpots and two bands of yellow. Fabricius, &c.

Bifasciata, a fpecies of Cicada (*Cercopis*), of a yellowifh colour, with brown wing-cafes, and two white bands. Fabricius. This is *Cicada fufca, fafciis alarum binis albis*, of Linn. Syft. Nat. XII. and *Cicada trifafciata*, of Degeer. Inhabits the north of Europe.

Bifasciata, a fpecies of Phalæna (*Geometra*), defcribed by Linnæus as a native of Europe. The anterior wings are cinereous, clouded, with two bands; pofterior pair white.

Bifasciata, a fpecies of Libellula, that inhabits America. The wings are hyaline, with a brown fpot at the bafe, and two bands of the fame colour. Fabricius. Obi. This is *Libellula trimaculata* of Degeer; and *Libellula pulchella* of Drury.

Bifasciata, a fpecies of Tenthredo, that inhabits Europe. The general colour is brown; thorax black; mouth fcutel, and four fpots white: on the abdomen two interrupted yellow bands; margin of the wings and legs yellow. Linnæus. Muf. Lefk.

Bifasciata, a fpecies of Mutilla, that inhabits New York. The colour is black; upper part of the head and thorax, and two bands on the abdomen red: wing violaceous-black. Swederus. Nov. Act. Stockh. Entirely downy, and twice the fize of M. Europæa.

Bifasciata, a fpecies of Tipula, of a yellowifh colour, with tranfparent wings palely fafciated with brown. Schranck Inf. Auftr. Of the middle fize, with the eyes black.

Bifasciata, a fpecies of Musca, that inhabits South America. It is rufous, with two golden bands on the abdomen. Fabricius, &c.

Bifasciata, a fpecies of Scolia, that inhabits New York. This infect is of a black colour; two dots on the anterior part of the thorax, fcutel, and two interrupted bands on the abdomen ferruginous. Swederus Nov. Act. Stockh.

BIFASCIATUS, in *Conchology*, a fpecies of Conus, figured by Born. This kind is white with angulated chefnut lines, and two orange bands: fpire rather prominent: bafe furrounded with orange lines, and the intermediate fpaces with teffellated fpots. Country unknown.

Bifasciatus, in *Entomology*, a fpecies of Scarabæus, that inhabits Coromandel: on the thorax is a triple protuberance, with an erect horn on the head; wing-cafes black, with two rufous bands. Fabricius.

Bifasciatus, a fpecies of Dermestes, of a black colour, with two waved yellow bands: thorax teffellated with cinereous colour. Thunberg. A native of the Cape of Good Hope.

Bifasciatus, a fpecies of Bostrichus, found in Siberia. It is of a black colour: wing-cafes yellow, with two blueifh-black denticulated bands. Gmelin. This is *Dermeftes bifafciatus* of Lepech. it.

Bifasciatus, a fpecies of Cryptocephalus, that inhabits Africa. It is rufous, with two fpots on the thorax, and two bands on the wing-cafes of black. Fabricius.

Bifasciatus, a fpecies of Cerambyx (*Prionus*), found in South America. The thorax is denticulated: body black: wing-cafes red, with two black bands: antennæ fhort. Gronovius, Fabricius, &c.

Bifasciatus, a fpecies of Attelabus (*Clerus*), of a braffy-green and downy: wing-cafes blue, with two fcarlet lines. Fabricius. A native of Siberia.

Bifasciatus, a fpecies of Gryllus (*Bulla-Acridium*), of a fufcous brown with white fpots, and two lateral ochrey-coloured bands. *Herbft apud Fuefli.* Inhabits fandy places.

BIFASCIELLA, a fpecies of Phalæna (*Tinea*), with fufcous gloffy wings; with two bands of white, the hinder one interrupted: head rufous. Fabricius. Inhabits Denmark.

BIFERÆ, in *Botany*, denote plants that flower twice a year, or in fpring and autumn.

BIFERNO, in *Geography*, a river of Italy, which runs into the Adriatic, not far from Termini.

BIFFA, in *Middle Age Writers*, a machine for cafting ftones and darts, having a moveable counterpoife, which turned round its yard.

BIFID Leaf, in *Botany*. See Leaf.

BIFIDUS, in *Entomology*, a fpecies of Cimex (*Reduvius*), of a black colour: wing-cafes with a rufous band; an erect bifid fpine on the fcutel. Inhabits China, and is of a large fize. Fabricius. Donov. Inf. China.

BIFOLIUM, in *Botany*. See Ophrys.

BIFORIS, in *Natural Hiftory*, a fpecies of Echinus, having at the bafe five furrows, and ten flexuous radiated lines;

lines; and near the vent two oblong perforations. *Leske apud Klein.* Its habitation unknown.

BIFORMIS, an appellation given to Bacchus, either because he is represented sometimes as a young man, sometimes as old; sometimes with a beard, and sometimes without one; or because wine, of which he is the symbol, renders men sorrowful and frantic, or gay and pleasant.

BIFRONS, a person doubled-fronted, or two-faced.

Bifrons is more peculiarly an appellation of Janus, who was represented by the ancients with two faces, as being supposed to look both backwards and forwards: though other reasons for it are recited by Plutarch. Sometimes he was painted with four-faces, *quadrifrons*, as representing the four seasons.

Bifrons, in *Entomology*, a species of Brentus, that inhabits Cayenne. This insect is black, with striated wing-cases, having glabrous yellow spots. Fabricius.

Bifrons, a species of Ichneumon, described by Linnæus: it is an European insect of a black colour, with the front white, with a black spot beneath the antennæ: tip of the petiole, and two first segments of the abdomen, with the legs reddish. Mus. Lesk.

Bifrons, in *Natural History*, a species of Nereis, described by O. Fabricius, and Müll. as a native of the north sea. It is depressed: peduncles with a simple setigerous papilla, cirrated above; those in the middle also branched. This creature is continually in motion; about an inch long, and of a fulvous or brownish colour: head white: eyes four: cirri seven: body attenuated at both ends, and consisting of fifty-six joints.

BIFURCATUS, in *Entomology*, a species of Cimex (*Oblongus*), that inhabits Germany. It is blackish: abdomen pale yellow, and bifurcated. Schæffer. Antennæ consist of four joints.

BIGA, a chariot for racing, drawn by two horses a-breast. The word ought rather to be written *bigæ*, in the plural; q. d. *bijugæ*, two horses being joined by a *jugum*, or yoke. Bigæ stands contradistinguished from *trigæ*, *quadrigæ*, &c. Bigæ are of very ancient standing: all the heroes in Homer, Hesiod, Virgil, &c. fought in them. The invention of bigæ is attributed by Pliny (N. H. vii. 56.) to the Phrygians; by Isidore, (xvii. 35.) to Cyristenes of Sicyon, who first yoked two horses together. They were first introduced into the olympic games in the 93d olympiad, or about the year 408 B. C. It appears, however, that the Greek heroes who celebrated the first Nemæan games in honour of Archemorus, were borne on bigæ. Bigæ were the chariots first used in the Circensian games; then *trigæ*, and afterwards *quadrigæ*. The moon, night, and the morning, are by mythologists supposed to be carried in bigæ, the sun in quadrigæ. Statues in bigæ were at first only allowed to the gods, then to conquerors in the Grecian games; under the Roman emperors, the like statues, with bigæ, were decreed and granted to great and well-deserving men, as a kind of half triumph, being erected in most public places of the city. Figures of bigæ were also struck on their coins, and those on which were a bigæ, and a Janus with a double face, were termed *Bigati nummi*.

The drivers of bigæ were called *bigarii*; a marble bust of one Florus, a *bigarius*, is still seen at Rome.

Biga, or *Bigata*, in *Writers of the Middle and Barbarous Age*, a cart with two wheels, drawn often with one horse. It was more frequently called *birota*.

Biga, in *Geography*, a town of Asiatic Turkey, in the province of Natolia, 16 miles S. of Artaki.

Biga, a river of North Wales, which joins the Severn in the county of Montgomery.

BIGAMY, a double marriage, or the possession of two wives at the same time. Among the ancient Romans, those convicted of bigamy were branded with a note of ignominy; and, in France, they were anciently punished with death. See Polygamy.

Bigamy, in the *Canon Law*, is where a person either marries two virgins successively; or once marries a widow. The former kind of bigamy they call *real*, and the latter *interpretative*. Each of these the canonists account impediments to be a clerk, or to hold a bishopric without a dispensation: a point of discipline founded on that of St. Paul, "Let a bishop be the husband of one wife," 1 Tim. ch. iii. ver. 2. Apost. Const. 17, 18. By a canon of the council of Lyons, A. D. 1274, held under pope Gregory X. such were esteemed "omni privilegio clericali nudati et coercioni fori secularis addicti." 6 Decretal, i. 12. This canon was adopted and explained in England by stat. 4 Edw. I. st. 3. c. 5.; and bigamy, in consequence of it, became no uncommon counter-plea to the claim of the benefit of clergy. M. 40 Edw. III. 42. M. 11 Hen. IV. 11. 48. M. 13 Hen. IV. 6. Staunf. P. C. 134. The cognizance of the plea of bigamy was declared by stat. 18 Edw. III. st. 3. c. 2. to belong to the court Christian, like that of bastardy. But by stat. 1 Edw. VI. c. 12. §. 6. bigamy was declared to be no longer any impediment to the claim of clergy. See Dal. 21. Dyer, 201.

The Romanists make a third kind of bigamy, by *interpretation*; as, when a person in holy orders, or that has taken on him some monastic order, marries.—This the bishop can dispense withal, at least on some occasions.

There is also a kind of spiritual bigamy; as when a person holds two incompatible benefices, v. gr. two bishoprics, two vicarages, two canonries *sub eodem tecto*, &c.

By the ecclesiastical law of England, a second marriage, while the former husband or wife is living, is simply void, and a mere nullity; nevertheless, the legislature has thought it just to make it felony, by reason of its being so great a violation of the public economy and decency of a well-ordered state. For the circumstances attending this crime, and the punishment of it, see Polygamy.

BIGARELLA, in *Botany*. See Prunus.

Bigarella, in *Geography*, a town of Italy, in the duchy of Mantua, 7 miles E.N.E. of Mantua.

BIGATI, in *Antiquity*, a kind of ancient Roman silver coins, on one side whereof was represented a *biga*, or chariot drawn by two horses. The bigatus was properly the Roman *denarius*, whose impression, during the times of the common-wealth, was a chariot driven by Victory, and drawn either by two horses, or four, according to which it was either denominated *bigatus*, or *quadrigatus*. Bigati therefore were of different values, according to the species of *denarii*, &c. Several of those called consular medals are also *bigati*. In lieu of horses, the chariot is represented on some *bigati*, as drawn by two deers, especially in the medals of the family of Axsia: on those of the family of Crepereia, by two *hippopotami*, who draw, or rather bear Neptune on their tails.

BIGBERRY, or Bigbury *bay*, in *Geography*, lies on the south coast of Devon, and is formed by the Bolt Tail on the east, and Stoke-point on the west, in the direction nearly of N.W. by W. The entrance into Plymouth sound is round Stoke-point to the N.W.

BIG-BONE Creek, an American creek in Woodford county, Kentucky, which falls into the Ohio from the east, in about N. lat. 39° 17. W. long. 85° 54′. It is small, but has three branches; the north-westernmost interlocks with Bank Lick creek, which falls into Licking river. It is noticed on account of the large bones and salt licks in its vicinity.

Big-Bone *Licks* lie on each side of the above-mentioned creek,

creek, a little below the junction of the two eastern branches, about 8 miles from the mouth of the creek. These, and also the other salt springs, in the western country, are called *licks*, because the earth about them is furrowed up in a very curious manner, by the buffaloes and deer which lick the earth, on account of the saline particles with which it is impregnated. A stream of brackish water runs through these licks, the soil of which is of a soft clay. The large bones found here, and in several other places near salt licks, and in low soft grounds, thought to belong to the Mammoth, have perplexed naturalists, in their investigation of the animals to which they belong. See Bones *fossile*, and Mammoth.

BIGEMINATE Leaf, in *Botany*. See Leaf.

BIGERRA, in *Ancient Geography*, a town of Spain, which, according to Livy, was attacked by the Carthaginians, because it was allied to the Romans, but it was succoured by Scipio. Ptolemy assigns it to the Bastitani, in Tarragonensis.

BIGERRONES, a people of Gaul, so called by Cæsar, and denominated by Pliny, *Bigerri;* and by Ausonius, *Begeritani*. M. d'Anville places them at the foot of the Pyrenées, to the west of the Convenæ. Their name exists in that of Bigorre.

BIGGAR, the name of a town and parish of Lanarkshire, in Scotland. The parish includes an area of land, measuring about 6 miles, by 3½, in transverse diameter. The surface is partly hilly, and is appropriated, in nearly equal parts, to pasture and arable. The population of the parish in 1790 was 937, but this was 161 less than when a return was made 36 years anterior. From the improved state of the roads, and of agriculture, it was found to contain 1216 persons in the year 1800. The town of Biggar has 389 inhabitants. Here are three annual fairs. At the west end of the parish are the vestiges of a large tumulus, and three encampments. Tradition says, that a desperate battle was fought here between the Scots under sir William Wallace, and the English army, when the slaughter was very great. Sir John Sinclair's Statistical History of Scotland.

BIGGE, a river of Germany, which runs into the Lenne, 3 miles north of Allendorn, in the duchy of Westphalia.

BIGGEL, in *Zoology*, *Antilope Tragocamelus* of Gmelin, in Mandelsl. it.

BIGGLESWADE, in *Geography*, is a large improving town of Bedfordshire, England, pleasantly situated in a fertile valley, on the eastern bank of the river Ivel. This has been rendered navigable to the town by act of parliament, and considerable quantities of coals, timber, corn, and some other commodities, are brought by this channel. An extensive weekly market, and four annual fairs, also attract various merchandize to the town. The manor belongs to the king, and the parish includes, besides the town, the small hamlets of Stretton and Holme. These together contain a population of 1650 persons, who occupy 301 houses. The church, an ancient and strong edifice, was partly built in the year 1230, and was formerly collegiate. The inhabitants, being free tenants, have all equal rights in the church. In this town are two charity-schools; also a Baptist meeting-house; and being seated on a great public road, it contains several large inns. Biggleswade suffered very materially by fire, which happened on the 16th of June 1785. In a few hours 150 dwelling-houses were reduced to ashes, besides some malt houses, corn-chambers, &c. which were situated round the market-place, near the centre of the town. The damages sustained by this fire were estimated at 24,000l. Since the conflagration several new houses have been erected, and the town has assumed a more modern and improved appearance. On the 25th of February 1792, a shock of an earthquake greatly alarmed the inhabitants of this place, and its concussion was so powerful as to throw down some old houses. It lasted several seconds, and was found to extend northward into Yorkshire, and towards the sea-coast of Lincolnshire. In the manor of Stretton, a a short distance south-east of Biggleswade, as a carter was ploughing the land, he discovered a yellow earthen pot, which was found to contain about 300 gold coins of Henry VI. They were nearly the size of half crown pieces each, but being very thin did not equal the weight of a guinea.

About 4 miles west of Biggleswade, are the remains of Warden-abbey, which was formerly a very extensive and considerable foundation. It was founded in 1135, by Walter Espec, for Cistercian monks; and at the dissolution its revenues were valued at 389l. 16s. 6d. per annum. Leland's Itinerary. Camden's Britannia. Beauties of England and Wales, vol. i.

BIGGS Bay, lies on the south side of Jamaica, and to the east of north from Portland-point, which is the most southerly point of the island.

BIG-HILL Creek, an American creek, which runs west into the Kaskaskias river, 25 miles below Beaver creek, 17 above Blind creek, and 26 northerly from the mouth of Kaskaskias.

BIGGIN Swamp. See Santee *River*.

BIGHT, in the *Sea Language*, denotes any part of a rope, as it is taken compassing, coiled up; or the double part of a rope, when it is folded, in contradistinction to the end. It signifies also a small bay between two points of land.

BIGINI, in *Geography*, a town of Sicily, in the valley of Mazara, 10 miles east of Mazara.

BIGIS, in *Ancient Geography*, a town of Asia, placed by Ptolemy in Drangiana.

BIGLA, in *Geography*, a town of Lithuania, in the palatinate of Wilna, 40 miles E. N. E. of Wilcomirz, near a lake from which the river Drisna issues. N. lat. 55° 26'. E. long. 20° 24'.

BIGLOBATUS, in *Entomology*, a species of Curculio, found at the Cape of Good Hope. This is of a black colour, with a canaliculated snout; thorax globose, very rough with punctured dots; wing-cases with scabrous dots, and two rows of tubercles on each side. Sparrm. Nov. Act. Stockh.

BIGLUMIS, a species of Vespa, with four dots on the scutel; margin of the abdominal segments white, with two white dots on the second. Gmelin. *Vespa Rupestris* of Linn. Syst. Nat. is deemed a variety of this kind.

BIGNAN, in *Geography*, a town of France, in the department of Morbihan, and chief place of a canton in the district of Josselin, 3 leagues S.W. of Josselin.

BIGNI, in *Conchology*, a name under which Adanson describes *Voluta Tringa* of Gmelin.

BIGNON, Jerom, in *Biography*, was born at Paris in 1590, and educated by his father, who was an advocate in the parliament of Paris, and distinguished by his learning and character. Having made a surprising progress under his father's tuition, he was placed, about the age of ten years, near the person of the young prince of Condé, and about this period published, "A Description of the Holy Land," more accurate than any extant. In 1604, he composed for the use of the young duke of Vendome, a "Treatise on Roman Antiquities." These works were compilations; but his work on the "Election of the Popes," said to be composed in his fourteenth year, but not published till 1608, was of a more original kind, and displayed a degreee of erudition that surprised the most learned men of the age. Bignon

non was regarded by Scaliger, Casaubon, Grotius, Pithou, de Thou, Le Fevre, and other eminent scholars, as a prodigy of literature, and his acquaintance was eagerly cultivated. By Henry IV., who knew his extraordinary talents and attainments, he was appointed page of honour to the dauphin, afterwards Lewis XIII.; and at court his manners were distinguished by an easy politeness, though he unremittingly prosecuted his literary studies. His next treatise was a refutation of Valdez, a Spanish writer, who published a folio volume to establish the precedence of the kings of Spain over the other sovereigns; it was entitled "On the Excellence of the Kings and Kingdom of France," dedicated to Henry IV. and published in 1610, 8vo. Upon the death of Henry, he withdrew from court, and acquired an additional reputation by a new edition of "The Formularies of Marculphus," published with learned notes, in 1613. In the following year he took a journey to Italy, where he was honourably received by pope Paul V., Father Paul at Venice, and other persons, who had already heard of his fame. Upon his return he devoted himself to the bar, and, in 1620, was appointed advocate-general to the great council; and having acquitted himself with credit in this office, he was nominated by the king a counsellor of state; and, in 1626, created advocate-general to the parliament. In this high station he maintained the parliamentary rights with firmness and vigour, and manifested the most ardent zeal for justice. In 1641, he resigned this honourable office to his son-in-law, Stephen Briquet; nor did he resume it till after his death in 1645. In 1642, cardinal Richelieu, though far from being his friend, appointed him royal librarian, which his taste for literature induced him to accept, whilst he declined the lucrative post of superintendant of the finances. Queen Anne of Austria, during her regency, availed herself of his advice on many interesting occasions, and he was employed in many delicate negociations. Having through life maintained a character, which was universally respected and esteemed, he terminated his course of useful service in the exercise of those sentiments of piety by which his conduct had been governed, in the 67th year of his age, April 7, 1656. Amongst his papers were found some fragments of notes on Gregory of Tours, and of a work on the origin of the French law, which he had not leisure to finish. The abbé Perrault has given a good account of his life, in one volume 12mo. 1757. Nouv. Dict. Hist. Gen. Dict.

BIGNONIA, so named by Tournefort, in honour of the abbé Bignon, Eng. *trumpet flower*, or *scarlet jasmine*, in *Botany*. Lin. gen. n. 759. Reich. 817. Schreb. 1018. Tourn. 72. Juss. 139. Gærtn. t. 52. Class and Order, *didynamia angiospermia*. Nat. Ord. *Personatæ. Bignoniæ*. Juss. Gen. char. *Cal.* perianth one-leafed, erect, cup-form, five-cleft. *Cor.* monopetalous, campanulate; tube very small, the length of the calyx; throat very long, ventricose beneath, oblong-campanulate; border five-parted, the two upper divisions reflex, lower patulous. *Stam.* filaments four, subulate, shorter than the corolla; two longer than the other two; another reflex, oblong, as it were doubled. *Pist.* germ oblong; style filiform, situation and form of the stamens; stigma capitate. *Per.* Silique two-celled, two-valved; partition membranaceous, parallel, thickened at the sutures. *Seeds* very many, imbricate, compressed, membrane-winged on both sides. Obs. *Catalpa* has only two perfect stamens, and three very small rudiments of stamens, with a five-leaved calyx. Four, however, and even all five perfect, have been observed by Cyrilli. The form of the silique in this genus is indeterminate. The seeds are always winged, though some on one side only.

Ess. Char. *Cal.* five-cleft, cup-form. *Cor.* throat bell-form, five-cleft, ventricose beneath. *Silique* two-celled. *Seeds* membrane-winged.

Species, 1. B. *Catalpa*, common Catalpa tree. Lin. spec. 868. Reich. 3. 155. hort. cliff. 317. 1. Ait. hort. Kew. 2. 346. Duham. Arb. 1. 104. t. 41. Catesb. Car. 1. 49. t. 29. "Leaves simple, cordate; stem erect; seeds winged with membranes." A deciduous tree, with an upright stem, covered with a smooth brown bark, 30 or 40 feet high; with lateral branches, ovate leaves placed opposite at every joint, flowers in branching panicles towards the end of the branches, of a dirty white colour, with a few purple spots, and faint stripes of yellow on their inside, which flowers are succeeded by long taper pods not yet produced in England. Found by Mr. Catesby growing naturally on the back of South Carolina, brought into England about the year 1726, and now not uncommon in our nurseries and plantations. In our climate the leaves come out very late; and the tree requires a sheltered situation. It flowers in August, and is known in the nurseries by its Indian name "Catalpa." The branches dye wool a kind of cinnamon colour. Thunberg mentions that the Japanese lay the leaves on parts of the body affected with pains, on a supposition that they are beneficial to the nerves; and that a decoction of the pods is serviceable in the asthma. 2. B. *tomentosa*. Lin. Syst. 563. Thunb. Jap. 252. "Leaves simple, cordate, tomentose beneath; flowers axillary, panicled." A native of Japan. 3. B. *sempervirens*, Carolina yellow jasmine, Lin. Spec. 869. Reich. 3. 155. Gelseminum. Park. 1465. n. 5. Raii hist. 1769. Catesb. Car. 1. t. 53. Syringa. Pluk. Alm. t. 112. f. 5. "Leaves simple, lanceolate, stem twining." Rising with slender stalks, that twist themselves round the neighbouring plants, and mount to a considerable height, with single opposite leaves at every joint, that remain green throughout the year; growing naturally in South Carolina, where it spreads over the edges, and, at the season of flowering, perfuming the air to a great distance; and also found in some parts of Virginia: called yellow jasmine, probably from the sweet odour of its flowers. Cultivated in 1640, in Kew garden, by Parkinson. 4. B. *unguis*. Lin. Spec. 869. Reich. 3. 156. Apocyno affine. Sloan. jam. 1. 268. Clematis. Plum. Amer. t. 94. Pluk. Alm. t. 163. f. 2. "Leaves conjugate; tendril very short, bowed, three-parted." A native of the West Indies. 5. B. *æquinoctialis*. Lin. Spec. 869. Reich. 3. 156. Sabb. hort. 2. t. 85. Plum. Spec. 5. ic. 55. f. 1. "Leaves conjugate, cirrhose; leaflets ovate and lanceolate; peduncles two-flowered; siliques linear." Received by Mr. Millar from La Vera Cruz, in New Spain. 6. B. *paniculata*. Lin. Spec. 869. Syst. 563. Reich. 3. 156. Jacq. amer. t. 116. Pict. 91. t. 175. Plum. Spec. 5. ic. 56. f. 1. "Leaves conjugate, cirrhose; leaflets cordate-ovate; flowers racemed; peduncles three-flowered." Sent to Mr. Miller from La Vera Cruz, by Dr. Houstoun. Observed about Carthagena by Jacquin. 7. B. *crucigera*. Lin. Spec. 869. Reich. 3. 157. Vir. cliff. 60. Hort. cliff. 317. 3. Gron. virg. 1. 73. 2. 95. Plum. ic. 48. t. 58. Pseudo-Apocynum. Mor. hist. 3. 612. n. 6. f. 15. t. 3. f. 16. "Leaves conjugate, cirrhose; leaflets cordate; stem muricated:" deriving its trivial name from a section of the stem which represents a cross. Sent to Mr. Miller from Campeachy. 8. B. *capreolata*, four-leaved trumpet-flower. Lin. Spec. 870. Syst. 563. Reich. 3. 157. Vir. cliff. 59. Hort. cliff. 317. Breyn. ic. 33. t. 25. Duham. Arb. 1. 104. t. 40. Catesb. Car. 2. 82. Clematis. Bocc. sic. 31. t. 15. f. 3. Zan. hist. 74. t. 2. ed. 2. 49. t. 33. Raii hist. 1329. "Leaves conjugate, cirrhose; leaflets cordate-lanceolate; bottom-leaves simple." Sent to Mr. Miller from Campeachy. A native of Virginia and Carolina; and cultivated

in

in Kew garden in 1730. 9. B. *pubescens*. Lin. Spec. 870. Reich. 3. 157. "Leaves conjugate, cirrhose; leaflets cordate-ovate, pubescent beneath." Growing naturally in Virginia, and several other parts of America. 10. B. *triphylla*, three-leaved trumpet-flower. Lin. Spec. 870. Reich. 3. 157. "Leaves ternate; leaflets ovate, acuminate; stem shrubby, erect." Sent to Mr. Miller from La Vera Cruz, by Dr. Houstoun. 11. B. *pentaphylla*, hairy five-leaved trumpet-flower. Lin. Spec. 870. Reich. 3. 158. Hort. cliff. 497. 6. "Leaves digitate; leaflets quite entire, obovate." Sent to Mr. Miller from Jamaica, by Dr. Houstoun; and introduced into Kew garden before 1733. 12. B. *Leucoxylon*, smooth five-leaved trumpet-flower, white-wood, or tulip-flower. Lin. Spec. 870. Reich. 3. 158. Swartz obs. 233. Pluk. alm. t. 200. f. 4. Brown jam. 263. n. 1. Sloan. jam. 2. 62. n. 47. Raii dendr. 114. 2. "Leaves digitate; leaflets quite entire, ovate, acuminate." According to sir Hans Sloane, this tree is as large as any in the island of Jamaica, having a large straight trunk covered with a smooth whitish bark, and a very hard white wood. According to Browne, it grows in a kind soil to a large size, and is considered as good timber-wood; but when its growth is not luxuriant, fit only for smaller and subordinate implements. Its juice and tender buds are said to be an antidote to the poisonous juice of the manchineel. Mr. Miller says, that it rises with an upright stem to the height of 40 feet, in the natural country of its growth; and that the seeds, dispersed by the winds to neighbouring lands, supply plants in great plenty. Cultivated by Mr. Miller in Kew garden, in 1759; and received by him from Barbadoes under the denomination of "white wood." 13. B. *radiata*, ray-leaved trumpet-flower. Lin. Spec. 871. Reich. 3. 158. Feu. peruv. 2. 731. t. 22. "Leaves digitate; leaflets pinnatifid." Stem three inches high; corolla pale yellow, with red dots. A native of Peru, in very dry sand. 14. B. *radicans*, rooting or ash-leaved trumpet-flower. Lin. Spec. 871. Reich. 3. 158. Hort. cliff. 317. 4. Upsf. 178. Gron. virg. 73. 94. Duham. arb. 1. 103. 1. Sabb. hort. 2. t. 84. Pseudo gelseminum siliquosum. Riv. mon. 101. Pseudo-Apocynum. Mor. hist. 3. 612. n. 1. f. 15. t. 3. f. 1. Park. 1679. and 385. n. 6. Gelseminum hederaceum Indicum. Corn. can. t. 103. Raii hist. 1768. β. B. fraxini fol. coccineo fl. minore. Catesb. car. 1. t. 65. Mill. fig. 43. t. 65. Duham. arb. 103. 2. "Leaves pinnate; leaflets gashed; stem with rooting joints." Stems rough, branches trailing, fastening by the roots, issuing from their joints, to the trees in their natural place of growth, and climbing to a great height; in Europe, where it is generally planted against walls, striking into the mortar of the joints, so as to support the branches, and rising to the height of 40 or 50 feet: flowers produced at the ends of the shoots of the same year, in large bunches, with long swelling tubes, shaped somewhat like a trumpet, whence the plant has the appellation of "trumpet-flower;" corolla of an orange colour, and opening at the beginning of August. Cultivated in Kew garden in 1640. The seeds of β. were sent from Carolina in 1724, by Mr. Catesby; and since that time many plants have been raised in England, by seeds sent from that country. 15. B. *stans*, branching-flowered trumpet-flower. Lin. Spec. 871. Reich. 3. 159. Jacq. Amer. pict. 91. t. 176. Brown. jam. 264. 3. Plum. Spec. 5. ic. 54. Sloan. jam. 2. 63. n. 49. B. frutescens. Mill. dict. n. 3. "Leaves pinnate; leaflets serrate; stem erect, firm; flowers racemed." An upright shrub from four to eight feet in height; flowers yellow, with red lines on the inside of the tube; siliques half a foot long, with winged seeds. A native of all the sugar islands in the West Indies, chiefly in a dry, rocky, or gravelly soil. Mr. Miller says, that he received this sort first in 1729, from La Vera Cruz, where Dr. Houstoun found it in great plenty; since which time he obtained the seed from the island of Bermuda, by the title of "candle-wood." 16. B *grandiflora*. Lin. Syst. 564. Thunb. jap. 253. Kæmpf. ic. fol. 21. "Leaves pinnate; leaflets ov te, acuminate, serrate; stem twining; calyx semiquinquefid." Stem shrubby, climbing, four-cornered; calyx five-cornered; corollas purple, the size of a rose: differing from the *radicans* in having a stem not at all rooting, a larger flower, and a semiquinquefid calyx. A native of Japan. 17. B. *chelonoides*. Lin. Syst. 564. Suppl. 282. Padri. Rheed. Mal. 6. 47. t. 26. "Leaves unequally pinnate; leaflets ovate, quite entire, acuminate, pubescent; corollas bearded, with the rudiment of a fifth stamen." A large tree, with a whitish ash-coloured bark; leaves spreading, petioled; panicle terminating: pedicels opposite, dichotomous; flowers solitary, from the divisions; calyx hoary; border of the corolla a little arched, rough with hairs, red, five-cleft; the two upper segments yellow, with red dots; lower segments rough with hairs, curled at the edge, disk waved, white, veins red, throat rough with hairs; the rudiment of a fifth stamen, inserted into the tube of the corolla, barren; siliques linear, flat, bent, streaked. The fresh flowers, immersed in water, give it a pleasant odour; and in the East Indies, of which it is a native, they sprinkle it over the temples in a morning, to correct the stagnant air. 18. B. *spathacea*. Lin. Syst. 564. Suppl. 283. Nür Pongelion. Rheed. Mal. 6. 53. t. 29. "Leaves unequally pinnate; leaflets ovate, rough with hairs; calyx one-leafed, spotted; corolla salver-shaped." A large tree, differing in the structure of the flower from the other species, but having didynamous stamens, and a pod filled with winged seeds. It is evidently of this genus. The timber is ash-coloured, or red, smooth, and much used for a variety of utensils in India. A native of Malabar, Java, and Ceylon, in woods near waters. 19. B. *peruviana*. Lin. Spec. 871. Reich. 3. 159. Hort. cliff. 317. 5. "Leaves decompound; leaflets gashed; stem with tendrils at the joints." A native of America. 20. B. *indica*, Indian trumpet-flower. Lin. Spec. 871. Reich. 3. 159. fl. zeyl. 236. Lour. cochinch. 379. Palega pajaneli. Rheed. Mal. 1. p. 77. t. 43. Raii hist. 1741. β. Pajaneli. Rheed. 79. t. 44. Raii hist. 1741. n. 2. "Leaves bipinnate; leaflets quite entire, ovate, acuminate." A large tree with ascending branches. A native of the East Indies, and Cochinchina. Introduced in 1795 by Dr. Solander. A variety occurs near Mozambique, in Africa. 21. B. *cærulea*. Lin. Spec. 872. Reich. 3. 160. Catesb. car. 1. t. 42. "Leaves bipinnate; leaflets lanceolate, entire." Grows naturally in the Bahama islands, whence Mr. Catesby sent the seeds, in 1724; and many of the plants were raised in the gardens near London. In the country where it grows naturally, it rises to the height of 20 feet. 22. B. *longissima*, wave-leaved trumpet-flower. Ait. Hort. Kew. 2. 347. Jacq. Amer. 182. t. 176. f. 78. Swartz Prodr. 91. Brown. jam. 264. 2. Plum. ic. 47. t. 57. B. Quercus Lamarck Encycl. 1. 417. "Leaves simple, oblong, acuminate; stem erect: seeds woolly." An elegant, upright tree, 40 feet high and upwards. A native of the West Indies; cultivated and growing luxuriantly in many parts of Jamaica, especially in the low lands and savannahs, where it grows to a considerable size, and is considered as an excellent timber-tree. Its numerous flowers, and slender siliques, add a peculiar grace to its growth. In Jamaica it is known by the name of "French oak;" and in the French West India islands it is called "Chêne noir." 23. B. *echinata*. Gærtn. fruct. 1. 240. t. 52. Jacq. Amer. 183. t. 176. f. 52. Aublet. Guian. 2. 648, t. 263, 264.

Swartz

Swartz prodr. 91. "Climbing; lower leaves ternate; upper bijugous, cirrhose; fruit echinate." A rambling shrub climbing to the tops of trees by its very long and numerous branches. A native of the West Indies, Carthagena, and Guiana. 24. B. *pentandra*. Lour. Cochinch. 379. "Leaves bipinnate; stamens five, with two anthers in each; calyx flesh-coloured, five-toothed." A middle-sized tree, with ascending branches. A native of Cochinchina, near rivers. Loureiro has another species under the name of B. *longissima*, which is a native of Cochinchina, by rivers, and which is not the B. *longissima* of Jacquin (N° 22.); agreeing, according to Loureiro, with the "lignum equinum" of Rumphius (vol. iii. p. 73. t. 46.), or B. *spathacea* of the younger Linnæus in the length and form of the corolla, but not in the spathaceous calyx and pinnate leaves. But Retzius observes, that Rumphius's plant is not the same with Linnæus's, and it is very different from the "Nur-Pongelion" of the Hortus Malabaricus. Loureiro also remarks, that the three Asiatic species which he has described can by no means be adapted to the generic character formed by Linnæus from the American species, except in the fruit; and even that is not always two-celled in the Asiatic species. 25. B. *alliacea*. Swartz prodr. 91. Aubl. guian. 659. 14. Barr. gall. æquin. 23. "Leaves conjugate; leaflets elliptic, entire, coriaceous; peduncles five-flowered, axillary; calyxes entire." This plant has a strong smell of garlic, whence its trivial title, and its French name "Liane à l'Ail." A native of the West Indian islands, and the forests of Cayenne and Guiana. 26. B. *cassinoides*. Vahl. Symb. 2. 68. Lamarck. Encycl. "Leaves simple, elliptic, coriaceous; raceme terminating." A native of Rio Janeiro, having the appearance of an "Echites." 27. B. *bijuga*. Vahl. Symb. 2. 69. "Leaves abruptly pinnate, bijugous; leaflets elliptic, quite entire." A native of Madagascar.

The *Bignonias* are trees or shrubs, inhabitants of the hot climates, of the East and West Indies, and eminently beautiful. The leaves are opposite; in some species unequally pinnate or ternate; in others, conjugate, with a two-leaved petiole between the leaflets, frequently furnished with a tendril for climbing. Flowers in panicles, large and handsome, of various colours, red, blue, yellow, or white. The calyx should be observed, whether it be simple or double; the corolla, whether it be regular or irregular; the stamens, whether they be fertile or barren; the fruit, whether it be bony or capsular, in form of a silique, or ovate. There are many species, particularly from Brasil, not yet sufficiently known to admit of arrangement under this genus. B. *sempervirens* does not belong to this genus, says Mr. Martyn, but to that of *lisianthus*.

Propagation and Culture.—These are exotic trees or shrubs, and may be raised from seeds sown on a moderate hot-bed in the spring. They should be soon inured to the open air, to prevent their being drawn up weak. They may be also increased by cuttings, and some of them by layers. The seeds of the common Catalpa tree are annually brought over from South Carolina. The seedling plants should be placed abroad in the beginning of June, in a sheltered situation, till autumn, and then placed under a summer frame, to guard them from the winter frost; exposing them in mild weather to the open air. In the following spring they should be taken out of the pots, and planted in a nursery-bed in a warm situation, where they may remain two years, and then planted where they are to remain. This tree may be also propagated by cuttings which, in the spring, should be planted in pots, and plunged into a moderate hot-bed, shading them from the mid-day sun, and occasionally, but sparingly, refreshing them with water. In about six weeks, when they have taken root, and made shoots above, they should have plenty of air, and accustomed to bear being exposed to the open air; and afterwards treated like the seedling plants. The Catalpa delights in a rich moist soil, where, in a few years, it will produce flowers. The plants of the third species, not bearing cold, when young, should be sheltered in winter, planted against a warm wall, and protected from frost by coverings of mats, and by tan covering the soil about their roots. The fourth and fifth species will live in the open air, when planted against a wall with a south aspect, and sheltered in a very severe frost. The sixth, seventh, eighth, tenth, eleventh, and twelfth sorts, are tender, and will not thrive in this country out of the bark-stove. If the ninth species be planted in the full ground against a wall, the roots should be covered in the autumn with some old tanners' bark, to keep out the frost in winter; and in very severe frost they should be covered with mats. The twelfth sort will take root from cuttings planted during summer in pots, or plunged into a bark-bed: it has flowered several years in the Chelsea garden, in August. The fourteenth sort is so hardy as to thrive in the open air; but the trailing branches should be supported; and as they spread much and rise to a great height, they will serve to cover unsightly buildings; and also trained against the stems of trees, they make a fine appearance when in flower. It is propagated by seeds, but the young plants thus obtained will not flower in less than seven or eight years; and therefore those propagated by cuttings or layers are most esteemed, because they will flower in two or three years after planting. The necessary culture for these plants, after they are established, is to cut away all the small weak shoots of the former year in winter, and shorten the strong ones to the length of about two feet; and thus young shoots will be obtained for flowering in the following summer. These plants are of long duration: some of them remain vigorous after 60 years, and produce plenty of flowers every season. The fifteenth species is propagated by seeds sown on a hot-bed, and by transplanting the plants into separate small pots, filled with light fresh earth, and plunged into a fresh hot-bed; by removing them in autumn into the bark-stove, giving them but little water during winter, and in summer refreshing them with it sparingly; and they should remain constantly in the bark-stove, and be treated like other tender plants from the hot countries. The third year from seed they will flower; but they do not produce seeds in England. The other sorts have not been cultivated in England. Martyn.

BIGORNO, in *Geography*, a town of Corsica.

BIGORRE, a country of France, in the province of Guyenne before the revolution, but now forming a part of the department of the Upper Pyrenées. Its capital was Tarbes. It is bounded on the N. E. by Armagnac and the country of the four vallies, Nebouzan and Astarac; on the south, by the Pyrenées; and by Bearn, on the west. It has been sometimes divided into the country of Rustan, the Plain, and the Vallies; and estimated at 16 leagues in length from north to south; and in its greatest breadth at 7 leagues. From its general situation, this country might be expected to enjoy the same mild climate that is experienced in the neighbouring provinces, under the same latitude; but from local circumstances the case is very different. The Pyrenées intercept the warmth of the more southern country of Spain; while, from its elevated situation, it is exposed to the chilling blasts of the north. On this account Bigorre is deprived of many fruits and vegetables, such as the orange and olive; however, the laurel, fig-tree, and myrtle, are not injured by the climate. The air of the mountains is cold and chilling, but that of the plains and vallies

vallies more mild and ſalubrious. This country produces wood in conſiderable quantities, excellent wine, rye, barley, and millet; but not much wheat. It has good paſtures, quarries of marble, and medicinal ſprings. The mountains of Bigorre conſiſt of ſchiſt, marble, and granite. See PYRENE'ES. The inhabitants of this diſtrict poſſeſs a peculiar and characteriſtic phyſiognomy, in which they all reſemble one another; they are healthy and active, lively and chearful, and unite impetuous courage with ſtrength and agility. The impetuoſity of their temper renders their language rapid, paſſionate, and full of protestations; and they ſometimes ſink the voice an octave below the natural key, that they may ſuddenly raiſe it to the ſharpeſt note. Their ideas abound with imagery; and their geſtures are quick and violent. They are diſtinguiſhed by their generoſity and beneficence. They practiſe the ſling from their infancy, and can draw a bow before they ſpeak; and thoſe perſons are regarded as the moſt accompliſhed, who are moſt ſkilled in leaping, riding, and throwing the bar. The education of the Bigorreſe, who are not huſbandmen, is conducted with a view to the church; and they boaſt of many eminent perſons in ſcience and literature.

BIGOT, a perſon fooliſhly obſtinate, or perverſely attached to an opinion. The word is formed from the German *bey*, and *Got*, or the Engliſh *by-God*. Camden relates that the Normans were firſt called *Bigots*, on occaſion of their duke Rollo; who receiving Giſſa, daughter of king Charles, in marriage, and with her the inveſtiture of the dukedom, refuſed to kiſs the king's foot in token of ſubjection, unleſs he would hold it out for that purpoſe; and being urged to it by thoſe preſent, anſwered haſtily, "No, by God;" whereupon the king, turning about, called him *Bigot*; which name has paſſed from him to his people.

BIGOT, EMERIC, in *Biography*, an eminent promoter of literature, was born at Rouen in 1626; and forming an early attachment to literature, he declined all public buſineſs, and employed himſelf in augmenting a large library bequeathed to him by his father, and in correſpondence and converſation with perſons of learning. Few perſons conciliated, by the modeſty of his temper, by the friendſhip and ſuavity of his manners, and by his love of peace and endeavours to maintain it, a greater number of friends, who reſpected and eſteemed him. In various parts of Europe, through which he travelled, he formed connections with literary men; but his moſt intimate friends of this deſcription were Menage and Nicholas Heinſius. Although he diſtinguiſhed himſelf by aiding others in their literary performances, the only work he publiſhed in his own name was the Greek text of Palladius's life of St. Chryſoſtom, found in the grand duke's library at Florence, to which he annexed a Latin tranſlation. Having entailed his valuable library on his family, in order to prevent its diſperſion, he died at Rouen in 1689. However, notwithſtanding his precaution, his library was publicly ſold at Paris in 1706. Gen. Dict.

BIGOT, in Italian *bigontia*, in *Commerce*, is uſed to denote a Venetian liquid meaſure, containing the fourth part of the *amphora*, or half the *boot*.

BIG ROCK, in *Geography*, a large rock on the S.E. bank of Au Vaze river in America; about 3 miles N.E. from its mouth in the Miſſiſſippi, and about 8 miles S.E. from cape St. Antonio on that river.

BIG *Rock Branch*, the north-eaſtern head branch of Alleghany river. The branch called Big Hole Town joins it, and forms the Alleghany, 85 miles N. E. from and above Venango fort.

BIG *Salt Lick*, a garriſon in the ſtate of Teneſſee, near the Salt lick, on Cumberland river, 115 miles from Knoxville; 80 from S.W. point on Clinch river, 32 from Bledſoe lick, and 68 from Naſhville.

BIG *Sandy River*, or *Totteroy*, riſes near the ſource of Cumberland river, and ſeparating Virginia from Kentucky, diſcharges itſelf into the Ohio, oppoſite to the French purchaſe of Galiopolis, in about N. lat. 38° 30'. Vancouver's and Harmar's forts ſtand on this river. On its banks are ſeveral ſalt licks and ſprings. *Little Sandy* is a ſhort ſmall river, which falls into the Ohio, about 20 miles weſt of Big Sandy river, in the county of Maſon, Kentucky.

BIGUBA, a town of North Africa, ſeated on the river Rio Grande. N. lat. 11° 15'. W. long. 13° 35'.

BIGUTTATA, in *Entomology*, a ſpecies of SILPHA, met with at Upſal. This is totally ferruginous, with a pale line and ſpot on the wing-caſes. Thunberg. Nov. Act. Stockh.

BIGUTTATA, a ſpecies of CASSIDA, with a yellow thorax; reddiſh wing-caſes; black margin, and two yellow ſpots. Fabricius. This inſect inhabits Cayenne.

BIGUTTATA, a ſpecies of COCCINELLA, deſcribed by Fabricius. It is rufous, with two yellow ſpots. The country is unknown. Size ſmall; thorax gloſſy and black, with the ſides yellow.

BIGUTTATA, a ſpecies of CANTHARIS, found in gardens in Europe, The thorax is black in the middle; wing-caſes ſhort, black, and yellow at the tip. Linn. Fn. Suec. Fabricius. This is *Telephorus niger, femoribus flavis, elytris apice luteis* of Degeer.

BIGUTTATA, a ſpecies of BUPRESTIS, with very entire, linear, green wing-caſes, with a white dot; abdomen blue, with three white dots. Fabricius, &c. Inhabits England.

BIGUTTATA, a ſpecies of CICADA (*Cercopis*), of a black colour, ſpotted with yellow; wing-caſes brown, with a white marginal ſpot. Inhabits Germany. Fabricius.

BIGUTTATA, a ſpecies of CICADA (*Ranatra* Fabr.) that is found in Europe. It is black, with a patch of ſanguineous red on each ſide of the thorax. Fabricius.

BIGUTTATA, a ſpecies of VESPA, of the ſmall ſize, that inhabits China. It is black, and ſpotted with yellow; margin of the ſegments, and two dots of yellow on the ſecond one. Fabricius.

BIGUTTATA, a ſpecies of SCOLIA, of a black colour, with two tranſverſe white dots on the abdomen; wings black. A ſmall ſpecies, and inhabits Spain. Fabricius.

BIGUTTATOR, a ſpecies of ICHNEUMON, deſcribed by Thunberg. It is black, with two dots on the ſcutel. Found at Upſal.

BIGUTTATUS, a ſpecies of CURCULIO, that is found in Germany. It is black, with elevated dots on the wing-caſes; abdomen and poſterior legs yellow. Fabricius.

BIGUTTATUS, a ſpecies of CRYPTOCEPHALUS, of a black colour, with the head, tip of the wing-caſes, and legs yellow. Gmelin. A native of Auſtria.

BIGUTTATUS, a ſpecies of CARABUS, that lives under the bark of trees in Sweden, and is deſcribed by Thunberg. The head is roundiſh and braſſy; wing-caſes black, with a pale ſpot at the apex.

BIGUTTATUS, a ſpecies of DYTISCUS, deſcribed by Linnæus as a native of Europe. This is black; legs, end of the abdomen, antennæ, mouth, two dots between the eyes, thorax, and wing-caſes teſtaceous, the latter ſpotted with brown; in the middle of the thorax two black ſpots.

BIGUT-

BIGUTTATUS, a ſpecies of STAPHYLINUS, that inhabits ſome ſhores of the Baltic ſea. It is of a black colour, with a fulvous ſpot on each of the wing-caſes. Linn. Fabr. &c.

BIGUTTATUS, a ſpecies of CIMEX (*Rotundatus*), deſcribed by Linnæus in his Fauna Suecica, by Scopoli, &c. It is black, with all the margins white, and a white ſpot on the wing-caſes.

BIGUTTULUS, a ſpecies of GRYLLUS (*Locuſta*), with a cruciate thorax; wing-caſes clouded, and marked with an oblong white ſpot near the tip. Linn. Fn. Suec. &c. This is *Acrydium biguttulum* of Degeer. Very common on ſome barren lands in the north of Europe.

BIHACS, BIHATZ, BIHITZ, or VIHITZ, in *Geography*, a town of Croatia, ſeated on the river Unna, belonging to the Turks; 60 miles ſouth of Carlſtadt, and 180 weſt of Belgrade. N. lat. 44° 42′. E. long. 16° 20′.

BIHAI, in *Botany*. See STRELITZIA.

BIHAMATA, in *Entomology*, a ſpecies of HISPA, of an oblong, depreſſed ſhape, that inhabits India. It is ſpecifically deſcribed as being unarmed, black, ſpotted with red; ſhells truncated and hooked. Gmelin.

BIHAMATA, a ſpecies of FORMICA, found in the iſland of Joanna, having four ſpines on the thorax, and two curved ones on the petiole ſcale. Fabricius, &c.

BIHAR, in *Geography*, an ancient town of Hungary, giving name to a diſtrict, in which are alſo Debretzen, Great Varadein, &c.

BIHOREAU, in *Ornithology*, the name of *Ardea nyticorax*, or *Night heron*, in Buffon's Hiſt. Birds. *Femelle de Bihoreau* of Buffon, is *Ardea griſea*; and *Bihoureau de Cayenne* of Buff. is *Ardea cayennenſis* of Gmelin.

BIHRI, in *Geography*, a town of Perſia, in the country of Lariſſan, in the route from Iſpahan to Ormus, 30 miles N.W. of Lar.

BIJINAGUR. See BISNAGUR.

BIJORE, called alſo *Bejour* and *Bajour*, the *Bazira* of Alexander, a province of Hindooſtan, bounded on the ſouth by Paiſhawur, on the north by Kuttore, on the eaſt by Sewad and Beneer, which are ſeparated from it by the Penjekoreh river, and on the weſt by Guznoorgul. This province, according to the dimenſions ſtated in the Ayen Acbaree (vol. ii. p. 192, &c.) extends 25 coſſes north and ſouth, and 10 eaſt and weſt; diſtant about 20 coſſes beyond the Cabul river, and on its weſtern extreme about 30 coſſes from the Indus. Bijore, as well as Sewad, is very mountainous, and abounds with paſſes and ſtrong ſituations; ſo that their inhabitants have not only held themſelves generally independent of the Mogul emperors, but have occaſionally made very ſerious inroads into their territories. In this province there is at this day a tribe of Afghans, denominated Yuzuf-zyes, which traces its origin to certain perſons left there by Alexander the Great, when he paſſed through this country. Both Abul Fazil, the author of the Ayen Acbaree, and Soojan Rae, an eaſtern hiſtorian of good reputation, report this tradition without any material alteration. The latter, indeed, adds that theſe Europeans, if we may call them ſo, continued to preſerve that aſcendancy over their neighbours which their anceſtors may be ſuppoſed to have poſſeſſed, when they firſt ſettled here. Although we ſhould reject this pedigree as fabulous, yet the bare claim argues the belief of the natives, for which there muſt have been ſome foundation, that Alexander not only conquered Bijore, but alſo transferred that conqueſt to ſome of his own countrymen. The people of Bijore had likewiſe an high idea of Alexander's extenſive authority; and they denominated him the "Two-horned," agreeably to the ſtriking emblem of power in all the eaſtern languages. (Ayen Acbaree, xi. 194.) Theſe Yuzuf-zyes, ſays Mahomed Cazim, quitted their ancient habitations between Ghizni and Candahar, and after various unſuccesſful attempts to obtain a ſettlement in Cabul, at the time when Mirza Ulug Beig, ſurnamed Cabulee, ruled that kingdom, finally eſtabliſhed themſelves in Sewad and Bijore; which at this period were governed by a dynaſty of princes ſtyled "Sultani," who derived their lineage from Alexander the Great. The Yuzuf-zyes poſſeſs, in addition to Sewad and Bijore, the tracts ſituated between thoſe provinces, and the rivers of Cabul and Indus; the greateſt part of which is deſcribed as a deſert in the Ayen Acbaree, but by Bernouilli as a foreſt. In the time of Acbar, Zine Khan was ſent to chaſtiſe them; and he overran their whole territory, and even penetrated to the borders of Caſhgar, and took the ſtrong fort of Kuſhal, or Guſhal, ſeated on a mountain 17 marches north of Bijore. About the year 1670, Aurungzebe found it neceſſary to chaſtiſe theſe Yuzuf-zyes; ſince which period the return of Nadir-Shah, in 1739, again brought them into notice. To him they appeared formidable; but he reduced them to ſubmiſſion; and if they really engaged to ſupply his army with 30,000 men, the tribe muſt have increaſed ſince the time of Acbar, when Bijore contained only 39,000 and Sewad 40,000 families. Rennell's Mem. p. 159, &c.

BIJORE, the capital of the above-deſcribed province, ſituated about 6 marches, or about 66 geographical miles, from Nilab or Attock, and at 50 of the ſame miles, north a little eaſt from Paiſhawur, and at the ſame diſtance eaſt a little north from Ialalabad. N. lat. 34° 7′. E. long. 70° 44′.

BIJORE, the name of a river which riſes in the mountains, N.E. of Bijore, and paſſing by it, forms a junction with the Penjekoreh, Sewad, and Kamela, and falls into the Nilab, or Sinde, at Attock.

BIISK, a town and diſtrict of Siberia, in the government of Kolyvan, ſeated on the river Bi, or Biia, which, by uniting with the Katunia, forms the river Oby; 150 miles S.S.E. of Kolyvan. N. lat. 53° 31′. E. long. 84° 14′.

BIJUGUM, FOLIUM, in *Botany*, denotes a winged leaf, bearing two pair of *foliola*.

BIKBULAKOVA, in *Geography*, a town of Ruſſia, in the government of Ufa, on the river Ik, 80 miles N.E. of Orenburg.

BIKILLAM, or BECKALEN, a ſmall iſland in the Red ſea, 8 leagues from the coaſt of Arabia. N. lat. 16°. E. long. 42° 25′.

BIKOU, a town of Poland, in the palatinate of Braclaw, 50 miles north of Braclaw.

BILA, a river of Bohemia, which runs into the Moldaw near Auſſig.

BILA, *Alt*, a town of Bohemia, in the circle of Leitmeritz, 10 miles W.S.W. of Kamniz.

BILÆNA, or BILBANA, in *Ancient Geography*, a town of Arabia Felix. Ptolemy.

BILAN, in *Geography*, a town of Bohemia, in the circle of Chrudim, 5 miles weſt of Chrudim.

BILANCIIS DEFERENDIS, in *Law*, a writ directed to a corporation, for the carrying of weights to ſuch a haven, there to weigh the wool, which perſons by our ancient laws were licenſed to tranſport. Reg. Orig. 270.

BILANDER, in *Navigation*, a ſmall merchant-ſhip with two maſts; diſtinguiſhed from other veſſels of the ſame kind by the form of the main-ſail, which reſembles a ſettee-ſail. The head is bent to a yard, ſimilar to the mizen-yard of a ſhip, and hangs to the main-maſt, as a ſhip's does to the mizen-maſt. This method of rigging has proved inconvenient, and is now ſeldom uſed, except by the Dutch.

BILANUS, in *Botany*. See CRATÆVA.

BILARIUS, PORUS. See BILIARII *Pori*.

BILATERAL COGNATION, denotes kinship, or kindred, on both sides; that of the father as well as mother.

Such is the relation of brothers, sisters. Bilateral stands contradistinguished to unilateral.

BILBA, in *Ancient Geography*, a town of Asia, in Babylonia. Ptolemy.

BILBAO, sometimes called *Bilboa*, in *Geography*, a port-town of Spain, in the province of Biscay, seated on the banks of the river Ybaizabal, about 6 miles from the sea. On the water-side is a large square, well shaded with pleasant walks, extending to the outlets on the banks of the river, and containing a number of houses and gardens, which form an agreeable prospect, particularly in sailing up the river. The number of houses in this town is about 800, some of which are built on piles; they are solid and lofty; the streets are well paved and level; and as they may be washed at pleasure, Bilboa is one of the neatest towns in Europe. The tide that flows into the river forms a secure and much frequented harbour; and a considerable commerce is thus carried on in iron, wool, of which, it is said, 60,000 bags are annually exported to Great Britain, France, and Holland, saffron, and chesnuts. Towards the close of the 10th century, the people of Biscay, having maintained their independence, together with their profession of Christianity, even when the Moors gained possession of the other parts of Spain, and having about this time obtained some advantages over them, began to direct their attention to the manufacture of their own excellent iron, not only for their own use, but for the supply of other nations; and their port of Bilboa began to have shipping, and to engage in foreign trade, perhaps before any other nation to the west of the Mediterranean sea, at least in a very considerable degree. In the last year of the 13th century, this town was refounded, or new built, by Didacus Lopez, then prince, or lord of the province; and as it was the staple port for the iron and wool of Spain, its commerce rapidly increased; and it appears from Rymer's Fœdera, that in the reign of king Edward IV. A.D. 1474, the merchants of Guipuscoa carried on, probably by the port of Bilboa, a considerable trade with England. It appears, also, that the Biscayners, availing themselves of the advantage of their shipping and port, were concerned in the whale-fishery at an earlier period than any other nation of Europe, Norway excepted. The town is supplied with flesh and poultry, and also with fish of various kinds, and particularly with a sort of eels in winter, which are small, of a pale colour, about three inches long, and without a back bone, caught in prodigious quantities at low tides, and in summer with the cuttle-fish. The shambles are a Tuscan building, in the centre of the town, with an open court, and a fountain in the middle, by means of which it is kept clean, and free from offensive offals and scents. The environs abound in gardens, which are fertile in legumes and fruits. This town has five churches, and several religious houses; and in its police it has one law of a peculiar kind, which renders ingratitude criminal, and subject to a penalty. Although the air is generally damp, the town is remarkably healthy, and the inhabitants are robust, cheerful, and long-lived; so that the hospital is frequently without a patient. The women are capable of enduring labour as well as the men, and are employed in unloading the ships, carrying burdens, and performing the business of porters. At the close of the day they return to their habitations, without any appearance of lassitude, dancing and singing to the pipe and tabor. Their music is defrayed at the expence of the town; and on holidays it is performed in the midst of a great concourse of persons under the trees in the great square. The women of Bilbao, though constantly exposed to the air, have good complexions, lively eyes, and fine black hair, which they curiously braid, and which they reckon peculiarly ornamental. Married women wrap a white handkerchief round their heads, so knotted as to fall down in three plaits behind, and over this they wear the Montera cap. Those who understand their language say it is very soft and harmonious, as well as energetic. N. lat. 43° 15'. W. long. 2° 45. See BISCAY.

BILBERRY, in *Botany*. See VACCINIUM.

BILBILINÆ AQUÆ, in *Ancient Geography*, *Alhama*, mineral and medicinal waters of Spain, 24 miles from Bilbilis, according to the Itinerary of Antonine. The name Alhama, given by the Arabians to this place, has the same meaning with the aquæ calidæ of the Latins. See ALHAMA.

BILBILIS, BAMBOLA, a town of Hispania Tarragonensis, belonging to the Celtiberi, south of Turiasco; seated on a mountain surrounded by the waters of Salo or Xalon. Bilbilis was a municipal town, and bore the title of Augusta, which is found on several medals. The poet Martial was of this city, called by Ptolemy *Bilbis*.

"Municipes Augusta mihi quos Bilbilis acri
Monte creat, rapidis quos Salo cingit aquis."
Martial, l. 10, epig. 103.

On most of the medals of Bilbilis, we perceive, on one side a head of Augustus, and, on the other, a cavalier, armed with a lance and a helmet.—Also, a river of Spain, the waters of which were famous for tempering iron; called also *Salo*.

BILBOWS, in *Sea-phrase*, a punishment answering to the stocks at land.

They consist of long bars, or bolts of iron, with shackles sliding on them, and a lock at the end, used to confine the feet of prisoners, in a manner similar to the confinement of the hands in handcuffs. See STOCKS.

BILCOCK, in *Ornithology*, one of the synonymous English names of *Rallus aquaticus*, or water-rail.

BILDERWERTSCHEN, in *Geography*, a town of Prussia, in the province of Lithuania, 4 miles W.N.W. of Stalluponen.

BILDESTON. See BILSTON.

BILDGE, or BILGE *of a Ship*, denotes the bottom of her floor; or the breadth of that part which she rests on, when she is a-ground.

Hence, when a ship receives a fracture in this place, by striking on a rock, or otherwise, she is said to be *bilged*, or *bulged*.

BILDGE-*Water*, is that which, by reason of the flatness of the ship's bottom, lies on her floor, and cannot go to the well of the pump. This water is always, if the ship does not leak, of a dirty colour, and disagreeable smell.

The Dutch, whose ships are often of this form, use a sort of pumps, called "bildge-pumps," or, as we call them "burr-pumps," to carry off the bildge-water.

BILE, in *Physiology*, is the fluid prepared from the blood by the liver of animals. The colour of healthy bile in the human subject is probably of a deep yellow brown. In oxen, it is frequently of a yellowish green. In the gall bladder, it is of a thickish consistence, of an unctuous feel, or like that of mucus, of a bitter taste, and peculiar smell. Its specific gravity is about 1.027. It readily mixes with water, but will not incorporate with oil, yet it takes grease out of cloths. Albumen may be precipitated from it by alcohol and acids; and Cadet ascertained its proportion in 100 parts of ox bile to be about 0.52. (Cadet, Mem. Par. 1767.) If a solution of bile in muriatic acid be concentrated by heat, a copious precipitate takes place, and the solution changes its colour from a grass

grafs green to a brown. This precipitate has the properties of a refin. From 100 parts of bile, 1.87 of cryftallized foda has been obtained, and fome was probably loft in the procefs. Cadet alfo obtained from bile a falt of a fweetifh tafte. There are other fubftances found in bile in fmall quantities: fulphurated hydrogen gas, which is emitted on the addition of muriatic acid; a little muriate of foda, phofphate of lime, and phofphate of foda and of iron. Of courfe water is the vehicle for all thefe fubftancee, and forms the largeft fhare of the ingredients in the compofition of bile. For an account of the fecretion of bile, fee the article LIVER, *functions of.*

BILE, in *Chemiftry*. This fluid may juftly be confidered as equally important to the chemift as to the phyfiologift; and accordingly it has been examined with extreme minutenefs by a great number of eminent chemifts, in various countries, with a general parity of refult which is highly fatisfactory. Indeed the analyfis of bile, as far as relates to the detection of its leading conftituent parts, is neither very complicated nor remarkably difficult.

Chemifts have not been able to detect any confiderable difference between the bile immediately fecreted from the liver, and that which is found in the gall-bladder, excepting that the latter appears on the whole to be fomewhat lefs watery, more bitter and more vifcid than the former. The age of the animal makes a greater difference, the bile or gall of oxen being more vifcid than that of calves. On account of the eafe with which ox-gall is procured in confiderable quantity, this has generally been felected for experiment; but its analyfis does not effentially differ from that of the bile of any other animal.

Bile is a homogeneous fluid, in fome animals of a deep yellowifh brown, in others of various fhades of green, fo vifcid as not to pour by drops; of a peculiar faint fmell, but not ungrateful when frefh, and not from a difeafed animal; intenfely bitter to the tafte, even when very largely diluted with water, and fomewhat pungent. It is confiderably heavier than water; its fpecific gravity being from about 1.02 to 1.025, varying according to the age and health of the animal, and probably to the time that it has remained within the gall-bladder. When agitated, bile lathers like foap water.

When bile is gently heated, an aqueous vapour arifes, which, when condenfed, appears by the moft delicate reagents to be nothing but water, ftrongly impregnated however with the odorous part of this fluid, and fomewhat fœtid. Bile lofes about feven eighths of its bulk of mere water by this evaporation; and the refidue gradually thickens into the confiftence of a tenacious extract, which, on carefully drying, becomes a hard brittle fhining refin-like mafs, of a dark colour, and intenfely bitter.

If this extract of bile be flowly heated in a retort to decompofition, the products are, a watery fluid fœtid with fulphuretted hydrogen gas, a brown fœtid liquor containing ammonia, a tenacious ftinking empyreumatic oil, with more carbonated ammonia, and a copious emiffion of carbonic acid, and carburetted with fulphuretted hydrogen. The mafs in the retort fwells up prodigiouffy in the procefs, and leaves a puffy coal eafy to incinerate, the afhes of which contain a notable quantity of carbonated foda, with fome muriated foda, phofphat of foda and lime, and a little iron. Fontana obtained from a pound of ox-gall 43 grains of carbonated foda, and 6 grains of common falt.

The refidue, therefore, of calcined bile contains alkali in excefs; and hence water, with which it has been lixiviated, readily turns fyrup of violets green. The fame teft of an alkali is given with frefh bile, diluted with water, that the change of colour may be more apparent.

The action of acids on bile throws much light on its compofition. Muriatic acid, ftrong or dilute, added to bile, immediately produces a coagulation, and, at the fame time, renders the whole liquor of a fine light green. The coagulum, however, is partly redifolved, if the acid is concentrated. Examined chemically, it is found to be albumen, but intenfely bitter. In the clear green liquor, though retaining the muriatic acid, the bitter tafte alfo ftrongly predominates. Evaporated flowly, it depofits in about an hour's time another precipitate, very green, intenfely bitter, and foft and tenacious like turpentine. The clear liquor is now yellowifh, and, on further evaporation, yields a number of cubical cryftals of muriated foda, formed chiefly, if not entirely, by the foda originally contained in the bile and the acid added. As a proof that this is the cafe, if the experiment is made with nitrous or fulphuric acid, inftead of the muriatic, the falt will be nitrated or fulphated foda. The above decompofition is more perfect, if bile and dilute muriatic acid are at firft boiled together for a few minutes; the refult then is a total feparation of a dark green glutinous bitter mafs, and a liquid now colourlefs and fcarcely bitter, from which the muriated foda may be procured by evaporation.

This glutinous coagulum, when dry, burns like a refin. Alcohol heated upon it diffolves one part, and leaves another untouched, thus entirely feparating it into two diftinct principles: the infoluble, which is albumen; and the foluble, which retains the colour and tafte of bile, is totally precipitated from the fpirit by water, is highly inflammable, infoluble in water, and has been confidered as a fpecies of refin or concrefcible oil, and is termed by fome the *refin of bile*. Fourcroy, however, fuppofes it to be more of the nature of *adipocire*.

Alcohol alone is another important re-agent for the analyfis of bile. When thefe two fluids are mixed together, a coagulum is immediately formed of a whitifh tenacious fubftance, fcarcely bitter when well wafhed, and exhibiting all the properties of albumen. The remaining liquor is green, and contains, mixed with the alcohol, the refinous, faline, and colouring matter of the bile. Alcohol equally feparates albumen from bile, infpiffated by evaporation, and diffolves the remainder. The alcoholic folution of bile, not previoufly treated by an acid, differs confiderably from that which has undergone this treatment. In the latter cafe, as before mentioned, the folution is decompofable by mere water, and by evaporation is converted into a very refinous product. In the former cafe, the folution mixes uniformly with water, yields by evaporation a tranfparent extract like gum-arabic, of a fweetifh tafte, a little mixed with the natural bitternefs of bile, and eafily foluble in water. The reafon of this difference is doubtlefs owing to the feparation of the foda from the refin of bile by the oxyd in one inftance, whereas in the other they remain united in the form of a natural foap. Hence it is that the affufion of an acid upon the latter alcoholic folution decompofes it, and feparates an unctuous fubftance, which again diffolved in alcohol is *now* precipitable from this folvent by fimple water, and refembles a pure refinous folution.

Some chemifts have thought that they could alfo detect a faccharine matter in bile, but the experiments to this purpofe are not conclufive.

The ozygenized muriatic acid gas paffed through bile diluted with a little water, foon deftroys its yellow green colour, and precipitates the albumen in white flocculi; the faponaceous

resin continues in solution without colour or smell; but the bitterness remains. A further quantity of this acid separates the resinous oil as the muriatic acid does, but white and concrete. Any acid poured upon bile already bleached by the oxymuriatic acid, separates unctuous white concrete matter much resembling *adipocire*, but the precise nature of the change produced by the oxymuriatic acid has not been properly ascertained.

Bile therefore may be inferred from the present state of chemical analysis to contain,

1. A large proportion of water,
2. A substance closely resembling animal albumen.
3. A peculiar resinous inflammable matter, naturally and intimately with
4. Soda, into a kind of soap, or saponaceous extract.
5. Some neutral salts.
6. A small quantity of oxyd of iron.

Besides these constituents, there is a colouring and odorant matter, but it is not yet ascertained whether these are properties of any of the above-mentioned ingredients, or whether they belong to a peculiar substance.

Some chemists have also supposed a kind of saccharine mucilage, resembling the sugar of milk, but the existence of this, in recent unaltered bile, is very doubtful.

Bile has been supposed to be a powerful antiseptic, and its effects in the animal economy have been attributed to this quality, but without much foundation. Bile, left to itself in a moderate temperature soon becomes putrid (though not so speedily as blood); it then exhales a very fœtid odour, but after this point it decomposes but very slowly, and at last assumes a strong, not very unpleasant musky smell. This partial resistance to putrefaction is probably owing to the resinous ingredient, which last, when separated by acids and alcohol, in the way already mentioned, is absolutely incapable of putrefaction. M. Cadet asserts, that at no time during this process is any acid generated.

The *saponaceous* quality of bile, which is very characteristic, and is owing to the intimate union of its resin with soda, renders it miscible with milk, with oil, myrrh, aloe, and other gum-resins, by trituration, without curling, or ready decomposition. It is also owing to an intimate mixture with this natural soap that the albumen which bile contains is not coagulable by heat; even if an additional quantity of albumen (white of egg for example) is mixed with bile, heat will not coagulate it. Hence too, alcohol only partially separates the albumen, unless an acid is previously applied to engage the soda, and the alcoholic solution of the resin retains the soda so as to render the resin not separable by mere water.

Bile, or ox-gall, is employed in various ways as a cleanser of wool, cloth, &c. to get out grease spots, to take off the greasiness of ivory in preparing it for receiving colours; and in China it is mixed with some of their varnishes. Gall a little putrid may be preserved a long time from further alteration by being boiled for a few minutes.

M. Fourcroy asserts, that he has obtained a substance, resembling bile in every property, by mixing blood with a third of water, coagulating it by heat, and slowly evaporating the serum. This experiment has, however, been repeated by others without success. See Cadet in the Mem. de l'Acad. des Sciences, for 1767 and 1769. Van Bochante, Professor at Louvian, in the Jour. de Phys. tom. 13. Suppl. An. Chim. tom. 4, 5, and 6. Fourcroy Systeme de Conn. Chim. &c.

Bile, in *Medicine*, a yellowish-green fluid, more or less viscid, and of a bitter taste, secreted in the liver, and conveyed from that viscus, by the so called ductus communis choledochus, into the duodenum. It is a very compound fluid, being resolved by chemical analysis into a variety of ingredients: such as water, albumen, resin, soda, muriate of soda, phosphate of soda, phosphate of lime and iron, besides a sweetish matter analogous to sugar of milk. In its general properties, it may be said to partake of the nature of a soap, although it will not intimately mix with oil. The cystic bile, or that which is contained in the gall bladder, possesses more viscidity and bitterness, (i. e. is more concentrated) than that which flows directly from the biliary ducts into the duodenum, and which is termed hepatic bile.

When we see an organ of such magnitude as the liver, appropriated to the secretion of the bile, we are naturally led to infer that the fluid so secreted, must answer some useful purposes in the animal economy; but respecting the number and kind of purposes which it answers, physiologists do not exactly agree. It may, perhaps, concur with the pancreatic juice, to the separation of the refuse part of the alimentary pulp (chyme) from the proper chyle; but, as Dr. G. Fordyce has remarked, in his treatise on the digestion of food, the bile does not unite with the chyle itself, and pass along with it, through the lacteals into the blood. Mixed with the feculent matter, and colouring it, the bile seems to prevent that matter from running into fermentation, by virtue of its alkaline nature; and perhaps, also, in consequence of the bitter principle which it contains, it may, in some degree, resist putrefaction; but its principal and most obvious use is, as a stimulus to the intestines, serving to keep up a due degree of peristaltic action, and thereby to produce a regular and natural evacuation of their contents. Hence a diminished secretion, or obstructed passage of the bile, is always accompanied with costiveness.

From this view of the nature and composition of the biliary secretion, and of its action upon the living body in a state of health; we proceed to the consideration of its morbid conditions, which may be reduced to four heads; viz. 1. *Deficiency*. 2. *Obstruction*. 3. *Excess*. 4. *Vitiation*.

1. *A deficiency of Bile*. This is known by a pale and languid habit of body, indigestion, flatulency, acidity, costiveness, and pale or clay-coloured stools. It is occasioned by a sedentary mode of life, by intemperance, and by depressing passions of the mind. It occurs in chlorosis, hypochondriasis, and chronic hepatitis. (See what is said of these diseases under their respective titles.) To whatsoever cause it may be owing, it is always attended with indigestion and costiveness; two symptoms which should be especially attended to in the cure. A well regulated diet should be prescribed, wherein spirituous drinks, high-seasoned meats, flatulent vegetables, and crude and acid fruits, should be forbidden. Much stress should at the same time be laid on a plan of regular exercise; and the injurious effects of cold and damp upon the gastric and hepatic systems, should be counteracted by suitable cloathing. As a further aid to digestion bitters and chalybeates (especially the chalybeate mineral waters), should be prescribed; and costiveness should be remedied by occasional doses of rhubarb, neutral salts, and aloetics; and sometimes by the stronger cathartics. Acidity should be counteracted by alkalies, among which soda or natron præparatum answers best. Where the diminished secretion of bile has appeared to be connected with a diseased structure of the liver, and particularly where such a change of structure has arisen from inflammation, mercury (Dr. Saunders observes), has been found useful, even carried to the degree of producing a slight salivation; moderating the violence, however, of its operations by plentiful dilution,

with

with gum arabic, and other vegetable demulcents. In these cases, the same author has found a tepid bath, of 90 degrees of Fahrenheit, to produce manifest good effects.

2. *Obstruction of Bile.* After it is secreted, the bile is sometimes prevented from passing into the duodenum. This may happen from various causes; viz. from an obliteration of the cavities of the biliary ducts, either by a thickening of their coats, or by a tuberculous state of the liver, the consequences of inflammation; from pressure produced by enlargements of the neighbouring parts; and from a too viscid and consistent state of the bile itself; but, more than all, from gall-stones impacted in the common duct. Whenever in any of these ways, the bile, after being secreted, is hindered from passing into the duodenum, it is either taken into the circulating system by what is termed regurgitation, or by absorption; producing great langour and oppression, together with a yellowness of the skin, and tunica conjunctiva of the eyes, &c. i. e. giving rise to *jaundice.* (See GALL-STONES and JAUNDICE.) The treatment must be varied, according to the variety of conditions on which the obstruction depends. In this place, it will be sufficient to remark, that saline purgatives, mercurials, saponaceous and alkaline medicines, with tepid dilution, and warm bathing, will be found suited to the majority of these cases.

3. *Excess, or redundancy of Bile,* is a morbid affection, of very frequent occurrence. Among its exciting causes may be mentioned intemperance of living, the summer and autumnal heats of our own latitudes, and more especially the high temperatures of the tropical climates; in a word, whatever produces a hurried circulation, or irritates the vascular and secreting system of the liver. A redundancy of bile makes itself known by "a general languor of the body, together with nausea, foul tongue, loss of appetite, and indigestion: or, by being directed to the intestines, excites a painful diarrhœa, ultimately tending to weaken their tone, and disturb their regular peristaltic motion. It generally happens, that, during the excess and prevalence of bile in the first passages, some absorption of it takes place into the habit, so that the skin becomes yellow, and the urine is sensibly impregnated with it. The pulse is quicker than natural, and there is a considerable degree of thirst, with an increase of heat; the usual symptoms of fever. The body becomes emaciated, and the general aspect of the patient is extremely unhealthy." It may be added, that most of the fevers of hot climates, whether intermittent, remittent, or continued, are accompanied by an overflow of bile. (See FEVERS.) When the increased secretion of bile affects the stomach and bowels in such manner as to excite both vomiting and purging to a violent degree, it gives rise to that form of disease which is termed *cholera;* of which a particular description will be found under that title; when it produces vomiting, joined with constipation and acute pains about the unbilical region, the disease is termed *bilious colic* (see COLIC); and lastly, when the evacuation of bile is frequent and copious by stool only, without frequent vomiting, it constitutes *bilious diarrhœa.* (See DIARRHOEA.) It is the remark of that judicious writer, to whose work we have more than once referred in this account of bilious disorders, that it is more difficult to supply a deficiency of bile, than to carry off its excess. In fact, little more is required for the fulfilment of this last intention, than to promote the discharge of the redundant bile by gentle saline evacuants, (for the bile has generally of itself a purgative tendency), and to prevent fresh accumulations, by diluting freely with water heated to a proper temperature. For this purpose, the patient should drink every morning (according to the excellent directions of Dr. Saunders), from half a pint to a pint of water, of a temperature from 90° to 114° of Fahrenheit's thermometer, and use moderate exercise before breakfast. With the same view, the Bath and Buxton waters, (provided their use be not contra-indicated by visceral disease), and the Cheltenham water also may be recommended. At the same time, a proper diet should be prescribed, consisting of food that is easy of digestion, not over-stimulating, and free from flatulency; and spirituous drinks and malt liquors should be forbidden. Pastry is particularly improper. Water, or wine and water, will be the best beverage. When the bile has been sufficiently evacuated, bitters and chalybeates may be given with advantage. But where these complaints are the consequence of residing in the tropical regions, the only effectual remedy is to remove to a temperate climate. People, who have suffered in these respects from the heat of climate, and to whom it is necessary to return to this country for the recovery of their health, should endeavour (as Dr. Lind has suggested), to arrive in the beginning of summer, as they will find the winters of Great Britain, on their first arrival, too piercing and severe for their constitutions.

4. *Vitiation of the Bile.* In almost all cases wherein the secretion of bile exceeds the natural quantity, it is at the same time vitiated in its quality. Thus in bilious fevers, bilious diarrhœas, bilious colic, and cholera morbus, it is often vitiated both in colour and taste, appearing wholly of a pure green colour, and possessing a sharpness or acidity which sets the teeth on edge, and produces a burning and corroding sensation in the stomach, œsophagus and fauces, and at the same time violent twitchings in the intestinal canal. Such vitiations of the bile are common to infants, as well as to adults. The remedial treatment consists in evacuating the offending biles by the means specified under the preceding division (3), and correcting its vitiated qualities by the employment of alkalies, and by copious dilution with aqueous and mucilaginous liquors. After due evacuations, the stomach and bowels may be protected from the irritating action of the remaining bile by opiate medicines. Lind, Clark, Winterbottom, and other writers on the diseases of hot climates, may be referred to for many excellent observations on bilious disorders; but the best and most comprehensive treatise on this subject is that of Dr. Saunders.

BILEDGIK, in *Geography*, a town of Asiatic Turkey, in the province of Natolia, 32 miles N.W. of Eski-Shehr.

BILEDULGERID, a country of Africa, comprehending, according to some geographers, the southern part of Algiers, together with the whole tract of land that lies in this direction between the Atlantic ocean and Egypt, and in this extent, including eight large tracts or provinces, viz. Barca, Biledulgerid proper, Segelmessa, or Sijilmissa, Tafilet, Tigoarin, Zeb or Zab, Darka or Darah, and Tessel, besides several inferior districts, mentioned under the names of Oguela, or Augela, Fassan or Fezzan, and Gudamis or Gadamis, &c. It was known to the ancients under the name of *Numidia.* But in a more confined and proper sense, according to the arrangement of De Lisle, and several modern geographers, Biledulgerid includes that tract of land which lies south of Algiers and Tunis, and is bounded on the east by a ridge of lofty mountains, which separates it from Tripoli and part of Gadamis, on the west by the countries of Zab and Mezzab, and on the south by the province of Verghela, or Wergela. Its dimensions are not accurately ascertained; but it is somewhat of a square form, supposed to extend about 60 or 80 leagues every way, or from about 31° 15′ to 34° 15′ N. lat.; and from 5° 30′ to 10° E. long. Some have derived the appellation Biledulgerid from *Bel d el jerid,* or the "land of dates," under which denomination it is distinguished in Rennell's map of North Africa; but others, with

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Dr. Shaw, deduce it from *Blaid el jeride*, or the "dry country." The whole province of Biledulgerid, bordering to the south on Sahara, or the Great Desert, is mountainous, sandy, and barren, producing little or no sustenance but dates, which grow in such abundance, that various parts of it are covered with palm-trees bearing this fruit. The climate is hot and unhealthy; the people are meagre, swarthy, and shrivelled in their complexions, and their eyes are inflamed by the reflection of the sun-beams, from the white hard soil, and by clouds of dust and sand driven by the high winds at some seasons in such abundance, as to bury men and cattle under their collected masses. They are also subject to a scorbutic complaint, of which they can assign no probable cause, but so inveterate, that their teeth drop out, and their bodies become loathsome. In other respects they are healthy and vigorous, and live without sickness or disease to a great age. The plague of Barbary is scarcely ever heard of in this province, notwithstanding the contiguity of the two countries, and the frequent intercourse of their inhabitants. Biledulgerid, properly so called, has few rivers and towns. The natives of Biledulgerid are represented as a lewd, treacherous, thievish, and savage people, that delight in murder, blood, and rapine. They are, in general, a mixture of old Africans and wild Arabs; the former of whom lived with some degree of regularity and civil order, in a kind of villages composed of a number of little huts, whilst the latter inhabited moveable tents, and ranged from place to place in quest of food and plunder. These Arabs value themselves on their superiority with regard to birth and talents above the primitive inhabitants; and whilst they are wholly independent and free, they occasionally hire themselves to serve in the wars of the neighbouring princes, and hence arises the chief part of their public revenue; the rest pursue no other occupations besides plundering and hunting, and prrticularly hunting ostriches, the flesh of which they dress for food, and the feathers they barter for corn, pulse, and other necessaries. The other parts of these birds they use in their religious rites, as ornaments of dress, or as pouches and knapsacks. Besides dates and ostriches, they likewise subsist on the flesh of goats and camels; and for their drink, they use either the broth in which the flesh is boiled, or the milk of their camels, for they seldom taste water, which is not only scarce, but brackish and unwholesome. For the character and manners of those who inhabit that part of Biledulgerid, taken in its former extent, and bordering on the Atlantic ocean; see Monselemines and Mongearts.

BILEFELD. See Bielfeld.

BILGE. See Bildge.

BILGUER, John Ulrick, in *Biography*, born at Coire, in the country of the Grisons, in Swisserland; after passing through the usual course of education, practised surgery at Berlin, where he soon acquired such reputation, as to engage the attention of king Frederic the Great, who made him surgeon to one of his regiments, and, in progression, surgeon-general to the Prussian army. In the course of an extensive practice in this post, he had an opportunity of observing how very small a proportion of the men recovered from fractures, where the soft parts were greatly bruised, and the bones shattered, when the limb had been amputated, which in such cases was the general practice. This induced him to try more lenient methods, which he practised with such success, as to enable him to reduce the cases in which amputation should be declared to be necessary to a very small number. In 1761, he was admitted to the degree of doctor in medicine, by the university of Hall, in Saxony, when he read for his thesis "De membrorum amputatione rarissime administranda, aut quasi abroganda." This work was translated into French, and highly commended by Tissot, then in the zenith of his reputation, which gave the work such credit, and so quick a circulation, that it was soon naturalized in every country of Europe, and its diffusion has been attended with the most beneficial consequences. The methods recommended by the author for preserving fractured limbs, even in cases that have been before thought hopeless, succeeded so often, as very much to diminish the frequency of the operation. He also published at Glogau, in 1763, "Instructions for Surgeons of Hospitals," in German. In this work, he further defends and illustrates the doctrine contained in the thesis. In cases where amputation cannot be avoided, he advises leaving a portion of the integuments, a practice now become general. There are also other works published by this author on the practice of surgery, for the titles and accounts of which, see Haller's Bib. Chirurg. Eloy. Dict. Hist.

BILGHY, in *Geography*, a town of Hindoostan, in the Mysore country, and in that district ceded to Britain in 1799, 58 miles W.S.W. from Harponully, and 35 N.N.W. from Bednore. N. lat. 14° 8′. E. long. 74° 50′.

BILIARY *Calculi*. Some of the concretions found in the gall bladder or ducts, and which are generally of an oval form, are composed of a white substance like spermaceti, crystallized in brilliant plates or striæ. These concretions float in water, and are inflammable. They dissolve in heated alcohol, in oil of turpentine, and in alkalies; in the latter case, the solution has the properties of a soap.

Other biliary concretions are of a polygonal form, and generally very numerous; they are of a brownish colour, and are formed of concentric layers, of a substance resembling inspissated bile.

In some biliary concretions, there is a mixture of both the substances above described.

There are also sometimes found in the gall bladder dark-coloured small brittle concretions, which are insoluble in alcohol, or oil of turpentine, and which are not inflammable. (See Gall-Stones.) For a detail of experiments relative to Bile and these calculi, consult Cadet, Mem. Par. 1797. Fourcroy, Ann. de Chimie. Gren & Vauquelon, ibid. Ramsay in the Thesaur. Med. Edin. and Maclurg. See Calculi, *Biliary*.

BILIARII *Pori*, the excretory ducts of the liver, now commonly termed *vasa biliaria*. See Liver.

BILICH, a town of Siberia, 8 miles S.E. of Vercholensk.

BILIHAN, a town of Persia, in the province of Irac, 100 miles S.S.W. of Amadan.

BILIKOWKN, a town of Poland, in the palatinate of Kiov, 50 miles west of Kiov.

BILIMBI, in *Botany*, a species of the Averrhoa (see Averrhoa); which is carefully cultivated in the gardens of the East Indies, where it flowers throughout the year. The juice of the root is drank as a cure for fevers. The leaves boiled, and made into a cataplasm with rice, are famed in all sorts of tumors, and the juice of the fruit is used in almost all external heats, dipping linen rags in it, and applying them to the parts. It is drank, mixed with arrack, to cure diarrhœas; and the dried leaves, mixed with betel leaves, and given in arrack, are said to promote delivery. The fruit is pleasant to the taste when fully ripe, and is commonly eaten; when smaller, and unripe, it makes a very pleasant pickle.

BILIN, in *Geography*, a town of Bohemia, in the circle of Leitmeritz, 14 miles west of Leitmeritz. This place has a fine citadel, and a spring of acid water; and holds annual fairs.

BILINEATA, in *Entomology*, a ſpecies of LEPTURA, of a blackiſh-brown, with two lines on the thorax, and ſcattered dots on the wing-caſes yelloviſh. Scopoli, Gmelin. Inhabits Carniola.

BILINEATA, a ſpecies of CANTHARIS, with a yellow thorax, with a ſpot, and four brown dots: wing-caſes yellow, with a fuſcous line. Thunberg, &c. This is a native of the cape of Good Hope.

BILINEATA, a ſpecies of CHRYSOMELA, that inhabits Scandinavia. It is green, gloſſed with gold; anterior part of the thorax excavated; and a double blue line on the wing-caſes. Gmelin.

BILINEATA, a ſpecies of PHALÆNA (*Geometra*), with yelloviſh teſtaceous wings, waved with a broad ſtripe acroſs, having a brown and a white margin. Linn. Fn. Suec. &c. A very common inſect in hedges during the ſummer months; and is called in England ſometimes the *elm moth*.

BILINEATA, a ſpecies of PHRYGANEA, of a blackiſh colour, with brown wings, and two white lines on each margin. Inhabits the north of Europe.

BILINEATUM, in *Conchology*, a ſpecies of BUCCINUM, deſcribed by Liſter. The ſhell is tranſverſely ſtriated; ſpire obtuſe; the whorls with a ſpotted band and two lines. Its native country is unknown.

BILINEATUM, in *Entomology*, a ſpecies of PHALANGIUM, of a pale colour, with two dorſal lines and black dots. Fabricius. Inhabits Norway.

BILINEATUS, a ſpecies of CURCULIO. This inſect is brown, with two white lines on the wing-caſes. Inhabits Germany.

BILINEATUS, a ſpecies of CERAMBYX (*Prionus*), with crenated thorax, marked with two white-lines; wing-caſes ferruginous, ſpeckled with white, and bordered with yellow. Inhabits America. Fabricius, &c.

BILINEATUS, a ſpecies of CRYPTOCEPHALUS, of a minute ſize, that is found in Europe. This inſect is black, with two yelloviſh lines on the wing-caſes, and ferruginous legs. Gmelin. A native of Europe, and deſcribed by Linnæus as *chryſomela bilineata*.

BILINEATUS, a ſpecies of ICHNEUMON. It is black, with two yellow lines in front; abdomen depreſſed; legs red; tips of the poſterior ones brown. Linn. Muſ. Leſk.

BILINEATUS, in *Ichthyology*, a ſpecies of PLEURONECTES, found in China. It is thin, long, above yellow, with a brown margin; beneath reddiſh-white; entirely covered with very ſmall ſcales. This is ſpecifically diſtinguiſhed by having the lateral line double. Bloch.

BILINEATUS, in *Zoology*, a ſpecies of COLUBER, of a rufous colour, with two yelloviſh ſtripes; *la double-raie* of count de Cepede, and *bilineated ſnake* of Dr. Shaw. This kind, according to the former writer, meaſures two feet one inch in length, of which the tail is ſix inches and a half; colour rufous, each ſcale bordered with yellow; and from the back of the head are two bright golden-yellow ſtripes extending to the end of the tail; ſcales on the head large, thoſe on the body ſmooth; native country unknown; abdominal ſcuta 205, ſubcaudal ſcales 99.

BILINGUIS, in *Law*. See MEDIETAS *Linguæ*.

BILINGUIS, properly denotes a perſon who has two tongues in his mouth; an inſtance of which is given by Dolæus. It is alſo uſed for a perſon who ſpeaks two languages.

BILIOUS *Complexion*. See COMPLEXION, and TEMPERAMENT.

BILIOUS *Colic*. See COLIC.

BILIOUS *Diarrhœa*. See DIARRHOE

BILIOUS *Fever*. See FEVER.

BILIRIANS, in *Geography*, a denomination given to a claſs of inhabitants of the ſouthern parts of Ruſſia. In their origin they are Sarmates, who ſettled in their preſent habitations, and now exiſt under the name of Tſchuvaſches. See BOLGARIANS.

BILITZ, a town of Sileſia, in the principality of Teſchen, ſeparated from Biala by the river of the ſame name, and at a ſmall diſtance from it. N. lat. 49° 51′. E. long. 19° 6′.

BILIZIN, a town of Poland, in the palatinate of Novogrodek, about 18 miles N.E. of Novogrodek. N. lat. 53° 55′. E. long. 25° 45′.

BILL, in *Agriculture*, denotes an edge-tool, of the ax kind, with a hooked point, fitted to a handle, and uſed to lop boughs of trees, &c. When ſhort, it is called a "hand-bill;" when long, a "hedge-bill."

BILL, in *Common Language*, denotes a written or printed paper poſted up in ſome public place, for the purpoſe of advertiſing the ſale of any merchandize, ſhip, &c. or the ſailing of any veſſel, &c.

BILL is alſo uſed among tradeſmen and workmen for an account of goods ſold and delivered, or of work done, with the charge annexed.

BILL, in *Commerce*, denotes a ſecurity for money under the hand, and ſometimes ſeal of the debtor, without any condition or forfeiture, in caſe of non-performance.—In which it is diſtinguiſhed from a bond or obligation. See BOND.

It has been uſually defined a writing, wherein one man is bound to another to pay a ſum of money, on a day that is future, or preſently on demand, according to the agreement of the parties at the time when it is drawn, and the dealings between them.

BILL, in *Law*, denotes a declaration in writing, expreſſing a wrong or grievance, which the complainant hath ſuffered by the party complained of; or elſe ſome offence committed by him againſt ſome law or ſtatute of the realm. This bill is commonly addreſſed to the lord chancellor, eſpecially for unconſcionable wrongs done to the complainant; and ſometimes to others having juriſdiction, according as the law directs. It contains the fact complained of, the damages ſuſtained, and the petition of proceſs againſt the defendant for redreſs. This is uſed as well in criminal as in civil matters. In criminal caſes, when the grand jury upon a preſentment or indictment find the ſame to be true, they indorſe on it "billa vera;" upon which the offender is ſaid to ſtand indicted of the crime, and is bound to make anſwer to it; and if the crime touch the life of the perſon indicted, it is then referred to the jury of life or death, viz. the petty jury, by whom, if he be found guilty, then he ſhall ſtand convicted of the crime, and is by the judge condemned to death.

Many of the proceedings in the king's bench are by bill; it is the ancient form of proceeding, and was, and yet ſhould be, filed in parchment, in all ſuits, not by original. The declaration is a tranſcript of it, or ſuppoſed to be. See AMENDMENT.

In Scots law, every ſummary application in writing, by way of petition to the court of ſeſſion, is called a "bill."

BILL *of Appeal*. See APPEAL.

BILL *of Attainder*. See ATTAINDER.

BILL, *Croſs*. See CROSS-*Bill*, and SUIT in *Equit*

BILL *in Equity*, is a kind of petition addreſſed to the lord chancellor, with which a ſuit in chancery commences. This, in the nature of a declaration at common law, or a libel and allegation in the ſpiritual courts, ſets forth the circumſtances of the caſe at length, "in conſideration of which," (ſo this is the uſual language of the bill) "and for that your orator

is wholly without remedy at the common law," relief is therefore prayed at the chancellor's hands, and alſo proceſs of ſubpœna againſt the defendant, to compel him to anſwer upon oath to all the matter charged in the bill. See SUIT in *Equity*.

BILL *of Exception to Evidence*. See EXCEPTION.

BILL *of Exchange*, in *Commerce* and *Law*, a ſhort note, or writing, ordering the payment of a ſum of money in one place, to ſome perſon aſſigned by the drawer, or remitter, in conſideration of the like value paid to him in another place. (See REMITTANCE.) Or, it is an open letter of requeſt from one man to another, deſiring him to pay a ſum of money named in it to a third perſon on his account, or to any other to whom that third perſon ſhall order it to be paid; or it may be made payable to bearer. This kind of negociable ſecurity for money, invented among merchants in different countries, ſerves to facilitate the remittance of money from the one to the other, and of courſe the conduct of commercial tranſactions; ſo that, ſince its firſt introduction, it has extended itſelf to almoſt all pecuniary negociations.

Bills of exchange were unknown in the ancient Roman commerce, as well as juriſprudence. According to the common opinion, they are ſaid to have been brought into general uſe by the Jews and Lombards, when baniſhed for their uſury and other vices; who found means to withdraw their effects, which they had lodged in the hands of friends, both in France and England, by ſecret letters and bills conceived in ſhort preciſe terms, like the modern bills of exchange, which they negociated by the aſſiſtance of merchants and travellers. The Jews were baniſhed out of France by Philip Auguſtus, in 1143, and out of England, in 1290; but the uſe of paper credit was introduced in the Mogul empire in China, in 1236. It further appears, that bills of exchange were negociated at Hamburgh, in 1188; and it has been ſaid, that the faction of the Gibellins, being expelled Italy by the Guelphs, towards the cloſe of the 13th century, retired to Amſterdam, and uſed the ſame means for the recovery of their effects in Italy as the Jews had done; and hence, as ſome have thought, the Dutch merchants took the hint of negociating bills of exchange, and ſoon ſpread the practice throughout Europe. The ſame Gibellins are ſaid to be the inventors of the re-change, or re-exchange, on account of damages, charges, and intereſt, when bills of exchange, which they called "polizzo di cambio," are not paid, but returned on proteſt. In 1307, bills of exchange ſeem to have been in uſe in England, though their nature was not well underſtood at a much later period; and the firſt reference to them in an act of parliament, occurs in 1381, when they were forbidden to be uſed without the king's licence. In 1394, an ordinance was iſſued by the city of Barcelona, that bills of exchange ſhould be accepted within twenty-four hours after they were preſented, and that the acceptance ſhould be written on the back of the bill. Moreover, in 1404, the magiſtrates of Bruges requeſted thoſe of Barcelona to inform them what was the common practice, in regard to bills of exchange, when the perſon who preſented a bill raiſed money on it in an unuſual manner, in the caſe of its not being paid, and by theſe means increaſed the expences ſo much, that the drawer would not conſent to ſuſtain the loſs. The form of the bill, ſuch as is now uſed, is ſeen in the memorial, which alſo ſpeaks of uſance; and it alſo appears, that firſt and ſecond bills were at that time drawn, and that when bills were not accepted, it was cuſtomary to proteſt them. Anderſon's Hiſt. Com. vol. i. Beckman's Hiſt. of Invent vol. iii. p. 462.

In common ſpeech, a bill of exchange is frequently called a "draught;" but the former is the more legal, as well as mercantile expreſſion. The perſon who makes or draws the bill is called the "drawer," and he to whom it is addreſſed is denominated the "drawee;" and when he undertakes to pay the amount, he is called the "acceptor." The perſon to whom it is ordered to be paid is called the "payee;" and if he appoint another to receive the money, this other is called the "indorſee," as the payee is, with reſpect to him, the "indorſer;" and any one who happens for the time to be in poſſeſſion of the bill is called the "holder" of it. The time at which the payment is limited to be made is various, according to the circumſtances of the parties, and the diſtance of their reſpective places of reſidence. Sometimes the amount is made payable at ſight; ſometimes at ſo many days after ſight; at other times at a certain interval from the date. See USANCE.

Where the time of payment is limited by months, it muſt be computed by calendar, not lunar months; and where one month is longer than the ſucceeding, it is a rule not to go in the computation into a third. Thus on a bill dated the 28th, 29th, 30th, or 31ſt of January, and payable one month after date, the time expires on the 28th of February, in common years, and in the three latter caſes, in leap year, on the 29th; to which are to be added the "days of grace." Where a bill is payable at ſo many days after ſight, or from the date, the day of preſentment, or of the date, is excluded. Thus, where a bill payable 10 days after ſight is preſented on the firſt day of a month, the 10 days expire on the 11th; where it is dated the firſt, and payable 20 days after date, theſe expire on the 21ſt. (Ld. Raym 281. Stra. 829.) It is a cuſtom among merchants, that a perſon to whom a bill is addreſſed, ſhall be allowed a few days for payment, beyond the time mentioned in the bill, called "days of grace." In Great Britain and Ireland, three days are allowed; in other places more. If the laſt of theſe three days happens to be Sunday, the bill is to be paid on Saturday; but theſe days of grace are not allowed on bills payable at ſight. If bills become due on Sunday, or on ſuch holidays, when the law forbids buſineſs to be done, payment muſt be demanded or proteſt made for non-payment on the preceding day.

Bills of exchange are either "foreign" or "inland;" the firſt being thoſe which paſs from one country to another, and the latter ſuch as paſs between parties reſiding in the ſame country: and by the conſent of merchants, certain cuſtoms are eſtabliſhed with regard to foreign bills, which have been adopted as part of the law in every commercial ſtate. Inland bills of exchange do not ſeem to have been very frequent in England before the reign of Charles II. (6 Mod. 29); and foreign bills were much more regarded by the law than inland ones, as being thought of more public concern in the advancement of commerce. But at length the legiſlature, by two ſtatutes, viz. 9 & 10 W. 3. c. 17. and 3 & 4 Ann. c. 9. has ſet both ſorts of bills nearly on the ſame footing; ſo that what was the law and cuſtom of merchants, with regard to the one, is now, in moſt reſpects, the eſtabliſhed law of the country, with regard to the other.

Promiſſory notes, or notes of hand, are a plain and direct engagement in writing to pay a ſum ſpecified at the time limited in it, to a perſon therein named, or to his order, or to the bearer at large. Theſe notes were at firſt conſidered merely as evidence of a debt; and it was held that a promiſſory note was not aſſignable or indorſible, within the cuſtom of merchants; and that if ſuch a note had been indorſed or aſſigned over, the perſon to whom it was ſo indorſed or aſſigned, could not maintain an action within the cuſtom againſt the drawer of the note; nor could even the perſon, to whom it was in the firſt inſtance made payable, bring ſuch

action. (1 Salk. 129. 2 Ld. Raym. 757, 9.) But at length the legislature recognized them and put them upon the same footing with inland bills of exchange; by statute 3 & 4 Ann. c. 9. made perpetual by stat. 7 Ann. c. 25. § 3.; which enacts that promissory notes, payable to order or bearer, may be assigned and indorsed, and action maintained on them, as on inland bills of exchange. By stats. 15 Geo. III c. 51. and 17 Geo III. c. 30. made perpetual by stat. 27 Geo. III. c. 16. all negotiable notes and bills for less than 20s. are declared to be null and void; and notes or bills between that sum and 5l. must be made payable within 21 days after date, must particularize the name and description of the payees, must bear date at the time and place in which they are made, must be attested by a subscribing witness, and the indorsement of them must be attended with the same strictness in all respects, and made before the notes or bills become due. The omission of any one of these regulations and formalities vacates the security, and is penal to him that utters it. Bills of exchange and promissory notes must now be drawn on stamped paper; and the stamp is proportioned under stat. 31 Geo. III. c. 25. 37 G. III. and 41 G. III. c. 10. to the amount of the bill from sixpence to three shillings for such as are payable on demand; and for those payable after date from one shilling to four shillings. If foreign bills are drawn here, the whole set must be stamped; but bills drawn abroad are not liable to any stamp duty.

As bills of exchange were first introduced for the convenience of commerce, it was formerly thought that they could neither be drawn nor negociated by any person who was not actually a merchant; but it has been since decided, that any person capable of binding himself by a contract, may draw or accept, or negociate a bill of exchange, and by stat. 3 & 4 Ann. c. 9. be a party to a promissory note. However, an infant cannot be sued on a bill of exchange, nor a feme-covert, except in such cases as she is allowed to act in as a feme-sole. If a bill is drawn on two joint traders, the acceptance of one binds the other, if it concern the joint trade; but it is otherwise, if the bill concern the acceptor only, in a distinct interest and respect. On the subject of procuration with regard to bills; see PROCURATION.

A promissory note, when indorsed, begins to resemble a bill of exchange, for the indorser of the note corresponds to the drawer of the bill; the maker to the drawee or acceptor, and the indorsee to the payee; and this resemblance being fixed, the law is precisely the same in bills of exchange and promissory notes. It is now a decided point of law, that bills and notes made payable to bearer are equally transferrable with those payable to order; and the transfer in both cases equally confers the right of action on the *bona fide* holder. But the mode of transfer is different; as bills and notes payable to bearer are transferred by mere delivery, the others by indorsement.

There are other bills and notes which differ from those already described, and which are securities for money, because they are considered as money itself. These are "Bank-notes," "Banker's cash-notes," and "drafts on Bankers," payable on demand. Bank-notes are regarded in ordinary transactions by common consent as cash, and they have the credit and currency of money to every effectual purpose, and seem to be as lawful a tender. (Stat. 5 W. & M. c. 20. § 28. 3 Term. Rep. 554.) Banker's cash-notes, and drafts on bankers, are considered among merchants as money, and received in payment as ready cash; and if the party receiving them do not, within a reasonable time, demand the money, he must bear the loss in case of the banker's failure. The precise time is not absolutely determined; but it is held most adviseable to carry such drafts on bankers, as are payable on demand, for payment on the day in which they are received, if the situation of the parties admit of it.

Bills of exchange and promissory notes, which, according to the general principles of law, are to be considered only as evidences of a simple contract, are however in one respect regarded as specialties, and on the same footing with bonds; for they are presumed, unless the contrary be shewn by the defendant, to have been made on a good consideration; nor is it incumbent on the plaintiff either to shew a consideration in his declaration, or to prove it at the trial.

Bills of exchange, and also notes, are assignable or negotiable without any fiction; and every person to whom they are transferred may maintain an action in his own name against any one, who has before him in the course of their negociations rendered himself responsible for the payment of them. But the instrument, or writing, which constitutes a good bill or note, must have certain essential qualities. One of these is, that the bill or note should be for the payment of money *only*, and not for the payment of money *and* the doing of some other act. Another requisite quality is, that the instrument must carry with it a *personal* and certain credit, given to the drawer or maker, not confined to credit on any particular fund. But in the application of this principle, there is a material distinction between bills and notes. With regard to the former, where the fund is supposed to be in the hands of the drawee, the objection holds in its full force, not only because the productiveness of the fund is contingent and precarious, but because the credit is not given to the *person* of the drawer; but where the fund, on account of which the money is payable, either is in the hands of the drawer, or he is accountable for it, the objection will not hold, because the credit is personal to him, and the fund is only the consideration of his giving the bill. With respect to a note, if the drawer promise to pay out of a particular fund, then within his power, the note will be good under the statute; the payment does not depend on the circumstance of the fund's proving unproductive, or not, but there is an obligation upon his *personal* credit; the bare making of the note being an acknowledgment that he has money in his hands. Another essential quality of a good bill or note is, that it must be absolutely payable at all events, and not depend on any particular circumstances which may or may not happen in the common course of things. No precise form of words is necessary to make a bill of exchange or a note under the statute; any order, which cannot be complied with, or promise, which cannot be performed, without the payment of money, will make a good bill or note. As the words "value received," have been usually inserted in bills or notes, some doubt has occurred, whether they are essential. It is now understood, as a decided point, that these words are not necessary; for instruments of this kind are presumed to have been made on a valuable consideration; and therefore words, which import no more, cannot be essential. It has been queried, whether it be essential to the constitution of a bill of exchange, that it should contain words which render it negotiable, as "to order," or "to bearer;" and the point has not yet received a judicial decision. With regard to notes that have not these words, the person to whom they are made payable, may maintain an action on them, within the statute, against the maker. With regard to the acceptance of bills of exchange. See ACCEPTANCE. Forging the acceptance of any such bill, or the number or principal sum of any accountable receipt, is made felony by stat. 7 Geo. 2. c. 22.

The mode of transferring bills and notes is different according to the expressions which render them negotiable. Such as are payable to bearer, are transferred by delivery;

livery; if payable to A. B. or bearer, they are payable to bearer, as if A. B. were not mentioned. But to the transfer of those payable to order, it is necessary, in addition to delivery, there should be something, by which the payee may appear to express his order. This additional circumstance is called an "indorsement." See INDORSEMENT.

By the very act of drawing a bill, the drawer comes under an implied engagement to the payee, and to every subsequent holder, fairly entitled to the possession, that the person on whom he draws is capable of binding himself by his acceptance; that he is to be found at the place where he is described to be, if that description be mentioned in the bill; that if the bill be duly presented to him, he will accept in writing on the bill itself, according to its tenor; and that he will pay it when it becomes due, if presented in proper time for that purpose. In default of any of these particulars, the drawer is liable to an action at the suit of any of the parties beforementioned, on due diligence being exercised on their parts, not only for the payment of the original summentioned in the bill, but also in some cases for damages, interest, and costs; and he is equally answerable, whether the bill was drawn on his own account, or on that of a third person; for the holder of the bill is not to be affected by the circumstances that may exist between the drawer and another; the personal credit of the drawer being pledged for the due honour of the bill. If a man write his name on a blank piece of paper, and deliver it to another, with authority to draw on it a bill of exchange to any amount, at any distance of time, he renders himself liable to be called on as the drawer of any bill so formed by the person to whom he has given the authority. If acceptance be refused, and the bill returned, this is notice to the drawer of the refusal of the drawee; and then the period, when the debt of the former is to be considered as contracted, is the moment when he draws the bill; and an action may be immediately commenced against him, though the regular time of payment, according to the tenor of the bill, be not arrived; for the drawee, not having given credit, which was the ground of the contract, what the drawer had undertaken has not been performed. When a bill of exchange is indorsed by the person to whom it was made payable, as between the indorser and indorsee, it is a new bill of exchange; as it is also between every subsequent indorser and indorsee; the indorser, therefore, with respect to all the parties subsequent to him, stands in the place of the drawer, being a collateral security for the acceptance and payment of the bill by the drawee; his indorsement imposes on him the same engagement that the drawing of the bill does on the drawer; and the period when that engagement attaches, is the time of the indorsement. Nor will any thing discharge the indorser from his engagement, but the absolute payment of the money; not even a judgment recovered against the drawer or any previous indorser, neither is his engagement discharged by an ineffectual execution against the drawer, or any prior or subsequent indorser. The engagement of the drawer and indorsers depends on certain conditions to be performed by the holder of the bill, and without the performance of which he has no remedy against them.

When the payment of the bill is limited to a certain time after sight, the holder must present it for acceptance, otherwise the time of payment will never come. Although it has never been directly determined, whether the holder of a bill, payable at a certain time after date, be bound to present it for acceptance immediately on receiving it, or whether he may wait till it become due, and then present it for payment; yet in practice it often happens that a bill is negociated and transferred through many hands, without acceptance, and not presented to the drawee till the time of payment; and no objection is ever made on that account. If, however, on the holder presenting the bill for acceptance, this be refused, he is bound to give regular notice to all the preceding parties to whom he intends to resort for non-payment; and if, on account of the holder's delay, any loss be incurred by the failure of any of these parties, he must bear this loss. It is also the duty of the holder of a bill, whether accepted or not, to present it for payment within a limited time; otherwise the law will imply that payment has been made, and it would be prejudicial to commerce, if a bill might be produced to charge the drawer at any distance of time, when all accounts might be adjusted between him and the drawee. A presentment either for payment or acceptance must be made at seasonable hours, which are the common hours of business in the place where the party, to whom the bill is presented, resides. If acceptance or payment be refused, or the drawee of the bill, or the maker of the note, has become insolvent, or has absconded, notice from the holder himself must be given to the preceding parties, and in this notice it must be added, that the holder does not intend to give him credit. What may be considered as a reasonable time, within which notice should be given, either of non-acceptance or non-payment, has been subject to much doubt and uncertainty. It was once held, that a fortnight was a reasonable time; but that period is now much contracted. With respect to acceptance, it is usual to leave a bill for that purpose with the drawee till the next day; but if he, when called upon the next day, delay or refuse to accept according to the tenor of the bill, it is now an established rule, where the parties, to whom notice is to be given, reside at a different place from the holder and drawee, that notice should be sent by the next post; and the same rule obtains in case of non-payment. Also in case of the drawee of the bill, or maker of the note, having absconded, or not being found, notice of these circumstances, in case either of non-acceptance or non-payment, must be sent by the first post. Considerable difficulty has occurred in establishing a general rule in this respect, where the party entitled to notice resides in or near the place in which the holder lives. The court, however, has on several occasions laid it down as a principle, that what shall be considered as a reasonable time in case of notice, and also of demand of payment, is a question of law; and this seems to have been fully established, and it is understood generally, that a demand must be made, and notice given, as soon as under all the circumstances it is possible to do so. As to the manner in which notice is given, either of non-acceptance or non-payment, there is a remarkable difference between inland and foreign bills. In the former no particular form of words is necessary to entitle the holder to recover against the drawer or indorsers, the amount of the bill, on failure of the drawee or acceptor; it is sufficient if it appear that the holder means to give no credit to the latter, but to hold the former to their responsibility. But in foreign bills, other formalities are required. If the person to whom the bill is addressed, on presentment, will not accept it, the holder is to carry it to a person vested with a public character, who is to go to the drawee and demand acceptance; and if he then refuse, the officer is there to make a minute on the bill itself, consisting of his initials, the month, the day, and the year, with his charges for minuting. He must afterwards draw up a solemn declaration, that the bill has been presented for acceptance, which was refused, and that the holder intends to recover all damages which he, or the deliverer of the money to the drawer, or any other, may sustain on account of the non-accept-

acceptance. This minute, in common language, is termed the "noting" of the bill; the ſolemn declaration, the "proteſt;" and the perſon whoſe office it is to do theſe acts called a "public notary;" and to his proteſtation all foreign courts give credit. If no ſuch notary be reſident in the place where the bill is negociated, proteſt may be made by any ſubſtantial inhabitant in the preſence of two credible witneſſes. For the circumſtances attending this proteſt, and the difference in this reſpect between inland and foreign bills, ſee PROTEST.

When a bill is once accepted abſolutely, it cannot in any caſe be revoked, and the acceptor is at all events bound, though he hear of the drawer's having failed the next moment, even if the failure was before the acceptance. The acceptor may however be diſcharged by an expreſs declaration of the holder, or by ſomething equivalent to ſuch declaration. But no circumſtances of indulgence ſhewn to the acceptor by the holder, nor an attempt on his part to recover of the drawer, will amount to an expreſs declaration of diſcharge. Neither will any length of time ſhort of the ſtatute of limitations, nor the receipt of part of the money from the drawer or indorſer, nor a promiſe by indorſement on the bill by the drawer to pay the reſidue, diſcharge the holder's remedy againſt the acceptor. Although the receipt of part from the drawer or indorſer be no diſcharge to the acceptor, yet the receipt of part from the acceptor of a bill, or the maker of a note, is a diſcharge to the drawer and indorſers in the one caſe, and to the indorſers in the other, unleſs due notice be given of the non-payment of the reſidue; but where due notice is given, that the bill is not duly paid, the receipt of part of the money from an acceptor, or maker, will not diſcharge the drawer or indorſers; becauſe it is for their advantage, that as much ſhould be received from others as may be. So the receipt of part from an indorſer is no diſcharge of the drawer or preceding indorſer. If the drawer of a note, or the acceptor of a bill, be ſued by the indorſee, and the bail pay the debt and coſts, this abſolutely diſcharges the indorſer as much as if the principal had paid the note or bill; and the bail cannot afterwards recover againſt the indorſer in the name of the indorſee. On the principles of ſeveral caſes it has been finally ſettled, that to entitle the indorſee to recover againſt the indorſer of an inland bill of exchange, it is not neceſſary to demand the money of the firſt drawer.

By the ſtat. 3 & 4 Ann. c. 9. § 7. it is enacted, that if any perſon accept a bill of exchange for and in ſatisfaction of any former debt or ſum of money formerly due to him, this ſhall be accounted and eſteemed a full and complete payment of ſuch debt; if ſuch perſon, accepting any ſuch bill for his debt, do not take his due courſe to obtain payment of it, by endeavouring to get the ſame accepted and paid, and make his proteſt according to the directions of the act, either for non-acceptance or non-payment.

Where a privity exiſts between the parties in a bill of exchange, an action of debt, or of "indebitatus aſſumpſit," may be maintained; but where it does not exiſt, neither of theſe actions will lie. A privity exiſts between the payee and the drawer of a bill of exchange; the payee and drawer of a promiſſory note; the indorſee and his immediate indorſer of either the one or the other; and perhaps between the drawer and acceptor of a bill; provided that, in all theſe caſes, a conſideration paſſed reſpectively between the parties. But no privity is ſuppoſed to exiſt between the indorſee and acceptor of a bill, or the maker of a note, or between an indorſee and a remote indorſer of either.

The action which is now brought on a bill of exchange, is a ſpecial action on the caſe, founded on the cuſtom of merchants. This cuſtom was not at firſt recognized by the court, unleſs it was ſpecially ſet forth; but when this cuſtom was recognized by the judges as part of the law of the land, and they declared they would take notice of it "ex officio," it became unneceſſary to recite the cuſtom at full length; a ſimple allegation that "the drawer, mentioning him by his name, *according to the cuſtom of merchants*, drew his bill of exchange, &c." was ſufficient. If the plaintiff, adhering to former precedents, thought proper to recite the cuſtom in general terms, and did not bring his caſe within the cuſtom ſo ſet forth; yet if by the law of merchants, as recognized by the court, the caſe as ſtated, entitled him to his action, he might recover; and the ſetting forth of the cuſtom was reckoned ſurpluſage, and rejected. Whether the drawer of a bill, or the indorſer of a bill or of a note, receiving the bill or note in the regular courſe of negotiation before it has become due, can maintain an action on it againſt the acceptor or maker, in the character of indorſee, ſeems undecided; but there is a caſe which clearly ſhews that a drawer or indorſer cannot maintain an action in the character of indorſee, "where the indorſement is after the refuſal of payment;" becauſe when a bill is returned unpaid, either on the drawer or indorſer, its negotiability is at an end. The action, therefore, in which the drawer or indorſer, after payment of the money in default of the acceptor, may recover, the firſt againſt the acceptor, and the latter againſt any of the preceding parties, muſt be brought in their original capacity as drawer or indorſer, and not as indorſee. If the drawee, without having effects of the drawer, accept and duly pay the bill without having it proteſted, he may recover back the money in action for money paid, laid out, and expended to the uſe of the drawer. Inſtead of bringing an action on the cuſtom, or on the ſtatute, the plaintiff may in many caſes uſe a bill or note only as evidence in another action; and if the inſtrument want ſome of the requiſites for making it a good bill or note, the only uſe he can make of it is to give it in evidence.

The holder of the bill or note may ſue all the parties who are liable to pay the money; either at the ſame time, or in ſucceſſion; and he may recover judgment againſt all, if ſatisfaction be not made by the payment of the money before judgment obtained againſt all; and proceedings will not be ſtaid in any one action, but on payment of the debt and coſts in that action, and the coſts in all the others in which he has not obtained judgment. But though he may have judgment againſt all, yet he can recover but one ſatisfaction; and though he be paid by one, he may ſue out execution for the coſts in the ſeveral actions againſt the others. To this action the defendant may plead the ſtatute of limitations; and by the expreſs proviſion of the ſtatute of queen Anne, all actions on promiſſory notes muſt be brought within the ſame time as is limited by the ſtatute of James, with reſpect to actions on the caſe. And to this plea it is no good replication, that it was on account between merchants, where it appears to be for value received.

As the action on a bill of exchange is founded on the cuſtom of merchants, ſo that on a promiſſory note is founded on the ſtatute 3 & 4 Ann. c. 9. In both caſes, however, it is neceſſary, that all thoſe circumſtances ſhould be expreſsly ſtated, or clearly and inevitably implied, which, according to the characters of the parties to the action, muſt neceſſarily concur, in order to entitle the plaintiff to recover. In ſtating the bill or note, regard muſt be had to the legal operation of each reſpectively. It has been decided, that the legal operation of a bill or of a note, payable to a fictitious payee, is, that it is payable to the *bearer*; and therefore it is proper in the ſtatement of ſuch a *bill*, to allege that the drawer thereby requeſted the drawee to pay ſo much money to the bearer;

bearer; and in the ſtatement of ſuch a *note*, that the maker thereby promiſed to pay ſuch a ſum to the bearer.

As to the *proof* that is neceſſary in actions on bills or notes, we may obſerve, that the plaintiff muſt, in all caſes, prove ſo much of what is neceſſary to entitle him to his action, and of what muſt be ſtated in his declaration, as is not, from the nature of the thing, and the ſituation of the parties, neceſſarily admitted. In an action againſt the acceptor, it is a general rule that the drawer's hand-writing is admitted; that of the acceptor muſt of courſe be proved; and that of every perſon, through whom the plaintiff, from the nature of the tranſaction, muſt neceſſarily derive his title. On a bill payable to *bearer*, in an action againſt the acceptor, he has only to prove the hand-writing of the acceptor himſelf; but in caſe of a bill payable to *order*, the plaintiff muſt prove the hand-writing of the very payee who muſt be the firſt indorſer. In caſe of a transfer by delivery, the plaintiff may be called upon to prove that he gave a good conſideration for the bill or note, without the knowledge of its having been ſtolen, or of any of the names of the blank indorſers having been forged. In an action by the indorſee againſt the drawer, the ſame rules obtain with reſpect to proof of the hand-writing of the indorſers, as in an action againſt the acceptors. That of the drawer himſelf muſt of courſe be proved; and it muſt alſo be proved that the plaintiff has uſed due diligence. From the rule, that in an action againſt the drawer or acceptor of a bill payable to order, there muſt be proof of the ſignature of the payee, firſt indorſer, and all thoſe to whom an indorſement has been ſpecially made, aroſe the queſtion, which long and greatly agitated the commercial world, on the ſubject of indorſements in the name of "fictitious payees." A bill, payable to the order of a fictitious perſon, and indorſed in a fictitious name, is not a novelty among merchants and traders. But in the years 1786, 7, and 8, two or three houſes, having connection in trade, and entering into engagements far beyond their capital, under an apprehenſion that the credit of their own names would not be ſufficient to procure currency to their bills, adopted, to a very extenſive degree, a practice which had before been found convenient on a ſmaller ſcale. For a conſiderable time, whilſt money could be procured for the payment of theſe bills by the acceptors or drawers, and they had ſufficient credit with the holder to have them renewed, the ſubject of theſe fictitious indorſements was not queſtioned. But when credit failed, and a commiſſion of bankruptcy became neceſſary, the other creditors felt it their intereſt to reſiſt the claims of the holders of theſe bills, and inſiſted that they ſhould not be allowed to prove their debts, becauſe they could not conform to the general rule of law, requiring proof of the hand-writing of the firſt indorſer. The chancellor, when the queſtion came before him by petition, directed trials at-law. From the deciſions in conſequence of theſe trials, the principal of which was affirmed in the Houſe of Lords, and which have ſettled that ſuch bills are to be conſidered as payable to *bearer*, it follows, that proof of the acceptor's hand only is ſufficient to entitle the holder to recover on the bill; and in a particular caſe, where the bill was drawn by the defendant and others on the defendant, it was determined that a *bonâ fide* holder for a valuable conſideration might recover the amount againſt the acceptor in an action for *money paid*, or *money had and received*. The effect of the determination of the judges in the Houſe of Lords, with reſpect to the principal caſe above alluded to, is as follows. If a bill of exchange be drawn in favour of a fictitious payee, with the knowledge as well of the acceptor as the drawer; and the name of ſuch payee be indorſed on it by the drawer, with the knowledge of the acceptor, which fictitious indorſement purports to be to the drawer himſelf or his order; and then the drawer indorſes the bill to an innocent indorſer for a valuable conſideration, and afterwards the bill is accepted; but it does not appear that there was an intent to defraud any particular perſon; ſuch innocent indorſee for a valuable conſideration may recover againſt the acceptor, as on a bill payable to bearer. Perhaps alſo, in ſuch caſe, the innocent indorſee might recover againſt the acceptor, as on a bill payable to the order of the drawee, or on a count ſtating the ſpecial circumſtances. On other caſes, afterwards brought before the Houſe of Lords on demurrers to evidence, the judges gave their opinion, that it was not competent to the defendants to demur; and that on the record, as ſtated, no judgment could be given. The whole diſcloſed a ſyſtem of bill-negociation to the amount of a *million a year*, on fictitious credit, which ended in the bankruptcy of many; but which had at leaſt the good effect of ſhewing that the obligations of law are not ſo eaſily eluded as thoſe of honour and conſcience.

In an action by an indorſee againſt an indorſer, it is not neceſſary to prove either the hand of the drawer or of the acceptor, or of any indorſer before him againſt whom the action is brought, every indorſer being, with reſpect to ſubſequent indorſees or holders, a new drawer. Where an action is by one indorſer, who has paid the money, proof muſt be given of the payment. In an action by the drawer againſt the acceptor, where the bill has been paid away and returned, it is neceſſary to prove the hand-writing of the latter, demand of payment by him, and refuſal, the return of the bill, and payment by the plaintiff. In an action on the caſe by the acceptor againſt the drawer, the plaintiff muſt prove the hand-writing of the defendant, and payment of the money by himſelf; or ſomething equivalent, as his being in priſon on execution. Where a bill is accepted, or a bill or note is drawn or indorſed, by one of two or more partners, on the partnerſhip's account, proof of the ſignature of the party accepting, drawing or indorſing, is ſufficient to bind all the reſt. When a ſervant has a general authority to draw, accept, or indorſe bills or notes, proof of his ſignature is ſufficient againſt the maſter; but his authority muſt be proved, as that it was a general cuſtom for him to do ſo, &c. An action on a bill of exchange being by an executor, and upon a debt laid to be due to teſtator, it was held neceſſary to prove that the acceptance was in the life-time of the teſtator. Where the defendant ſuffers judgment by default, and the plaintiff executes a writ of inquiry, it is ſufficient for the latter to produce the note or bill, without any proof of the defendant's hand; and on ſuch judgment, a writ of inquiry ſeems now to be unneceſſary.

As to the different ſubjects of *defence*, with regard to bills of exchange and notes, the moſt uſual are thoſe which ariſe either from the total want of conſideration, or from the illegality of the conſideration for which the bill or note was given. See CONSIDERATION.

If a bank-bill, payable to A. B. or bearer, be loſt, and it is found by a ſtranger, payment to him would indemnify the bank; yet A. B. may have trover againſt the finder, though not againſt his aſſignee for valuable conſideration, which creates a property. If the poſſeſſor of a bill accidentally loſes it, he muſt cauſe intimation to be made by a notary public before witneſſes, that the bill is loſt or miſlaid, and requiring that payment be not made of the ſame to any perſon without his privity. And by ſtat. 9 & 10 W. III. c. 17. if any inland bill of exchange for 5l. or upwards ſhall be loſt, the drawer of the bill ſhall give another of the ſame tenor, ſecurity being given to indemnify him, in caſe the bill ſo loſt be found again. If a bill loſt by the poſſeſſor ſhould

ſhould afterwards come into the poſſeſſion of any perſon, who pays a full and valuable conſideration for it, without knowledge of its having been loſt, the drawer and acceptor, if the bill was accepted, muſt pay it when due to ſuch fair poſſeſſor, ſo that the proviſions of the ſtatute may, in many caſes, be uſeleſs to the loſer of the bill. But againſt the perſon who finds the bill, the real owner may maintain an action of trover. Stealing bills of exchange, notes, &c. is felony in the ſame degree as if the offender had robbed the owner of ſo much money, &c. And the forging of bills of exchange, or notes of money, indorſements, &c. is felony, by ſtat. 2 Geo. II. c. 25. 9 Geo. II. c. 18. See alſo ſtat. 31 Geo. II. c. 22. § 78. Blackſt. Com. vol. ii. p. 466. Jacob's Law Dictionary, by Tomlins, vol. i. art. *Bill*.

Bill of *Indictment*. See Bill above, and Indictment.

Bill of *Interpleader*. See Interpleader, and Suit *in Equity*.

Bill of *Middleſex*, which was formerly always founded on a "plaint" of treſpaſs *quare clauſum fregit*, entered on the records of the court, is a kind of "capias," directed to the ſheriff of that county, and commanding him to take the defendant, and have him before our lord the king, at Weſtminſter, on a day prefixed, to anſwer to the plaintiff of a plea of treſpaſs. This bill of Middleſex muſt be ſerved on the defendant by the ſheriff, if he finds him in that county; but if he returns "non eſt inventus," then there iſſues out a writ of "latitat" to the ſheriff of another county, as Berks; which, in the court of king's bench, is ſimilar to the "teſtatum capias" in the common pleas, and recites the writ of Middleſex, and the proceedings thereon; and that it is teſtified, that the defendant "latitat et diſcurrit," lurks and wanders about in Berks; and therefore commands the ſheriff to take him, and have his body in court on the day of the return. But, as in the common pleas, the "teſtatum capias" may be ſued out upon only a ſuppoſed, and not an actual, preceding "capias;" ſo, in the king's bench, a "latitat" is uſually ſued out upon only a ſuppoſed, and not an actual, "bill of Middleſex:" ſo that, in fact, a "latitat" may be called the firſt proceſs in the court of king's bench, as the "teſtatum capias" is in the common pleas. Yet, as in the common pleas, if the defendant lives in the county wherein the action is laid, a common "capias" ſuffices; ſo, in the king's bench likewiſe, if he lives in Middleſex, the proceſs muſt ſtill be by "bill of Middleſex" only.

Bill, *Navy*. See Navy.

Bill, in *Parliament*, denotes a paper containing propoſitions offered to the houſes, to be paſſed by them, and then to be preſented to the king to paſs into an act or law: for the mode of preſenting and conducting of which, ſee Parliament.

Bills, *Lumbard*, are inſtruments of an uncommon kind and figure, uſed in Italy and Flanders, and alſo in France; conſiſting of a piece of parchment, cut to an acute angle about an inch broad at top, and terminating in a point at bottom; chiefly given where private perſons are concerned in the fitting out a ſhip for any long voyage.

The manner is this: the party who is deſirous to be concerned in the cargo or venture, carries his money to the merchant, who ſits out the ſhip, where it is entered down in a regiſter. At the ſame time, the merchant writes down on a piece of parchment, upwards of an inch broad, and ſeven or eight inches long, the name of the lender, and the ſum lent, which being cut diagonal-wiſe, or from corner to corner, each party retains his half. On the return of the veſſel, the lender brings his moiety to the merchant, which being compared with the other, he receives his dividend accordingly. Much the ſame is practiſed in Holland by thoſe who lend money on pledges: the name of the borrower, and the ſum, are written on a like ſlip of parchment, which is cut in two, and half given to the borrower, and the other half ſtitched to the pledge; that, upon comparing them together again, the borrower may receive his goods, on paying the money ſtipulated.

Bill, *to note a*. See Note, and Bill of *Exchange*.

Bill, *to proteſt a*. See Proteſt, and Bill of *Exchange*.

Bills, *bank*, are notes or obligations ſigned in behalf of the company of the bank, by one of their caſhiers, for value received. See Note, and Bill of *Exchange*.

Bill *of credit*. See Credit.

Bill *of entry*, an account of goods entered at the cuſtom-houſe, both inward and outward; in which are expreſſed, the name of the merchant importing or exporting, the quantity, number, and mark of the goods, and place from or to which they are imported, or to be exported.

Bill *of lading*, an inſtrument ſigned by the maſter of a ſhip, acknowledging the receipt of a merchant's goods, and obliging himſelf to deliver them at the place to which they are conſigned, in good condition. Of ſuch bills there are uſually three: the *firſt*, kept by the merchant; the *ſecond*, ſent to the factor to whom the goods are conſigned; and the *third*, kept by the maſter of the ſhip. See Charter-party.

Bills *of mortality*, are weekly liſts compiled by the pariſh-clerks in and about London, containing the numbers of ſuch as die of each diſeaſe, as well as of thoſe that are born every week. See Mortality.

Bill *of parcels*, an account of the particular ſorts and prices of goods bought, given by the ſeller to the buyer.

Bill *of rights*. See Rights.

Bill *of ſale*, is an inſtrument or writing which a perſon, wanting a ſum of money, and delivering goods as a ſecurity to the lender, gives to him, impowering him to ſell the ſaid goods, in caſe the ſum borrowed is not repaid, with intereſt, at the time appointed. See Sale.

Bill *of ſtore*, a licence granted at the cuſtom-houſe to merchants, to carry ſuch ſtores and proviſions as are neceſſary for their voyage, cuſtom-free.

Bill *of ſufferance*, a licence granted at the cuſtom-houſe to a merchant, to ſuffer him to trade from one Engliſh port to another, without paying cuſtom.

Bill, or Beak, *roſtrum*, in *Ornithology*, the elongated horny proceſſes or mandibles of birds. The form of the bill varies ſo greatly in different kinds of birds, that they afford the moſt permanent character by which theſe creatures may be arranged. In the diſtribution of families, Linnæus firſt notices the ſtructure of the bill, the tongue, and noſtrils; and theſe parts conſtitute almoſt excluſively (with the legs) the diſtinction of the genera likewiſe. See Ornithology, and *Anatomy of* Birds.

The phoenicopter's bill is a true *hyperbola*, pointed at the end like a ſword; and what is remarkable, the upper bill of this bird moves in eating, the lower being fixed, which is the contrary of what is found in all other kinds. The wood-pecker's bill is ſtrong, and ſharp enough to dig holes, and build in the heart of the hardeſt timber. See Phoenicopterus and Picus. Phil. Tranſ. N° 211, p. 155. N° 350, p. 509.

In the iſland of Ferro, a fixed reward is given for the bills of ravenous birds. All watermen are obliged to bring a certain number yearly to the country courts, at the feaſt of St. Olaus; when they are thrown into a heap, and burnt in triumph. Plott gives divers inſtances of monſtrous irregularities

gularities in the bills of birds; particularly of a raven, whose mandibles crossed each other, the lower chap turning upwards, and the upper downwards. Plott's Nat. Hist. Stafford. ch. vii. § 4.

BILLA VERA, *the bill is true.* The grand jury indorsing a bill whereby any crime punishable in that court, is presented to them, with the words *billa vera*, signify thereby, that the presenter has furnished his presentment with probable evidence, and worthy of farther consideration; whereupon the party presented is said to stand indicted of the crime, and bound to make answer thereto, either by confessing or traversing the indictment. See BILL in *Law*, *supra*.

BILLANCOURT, in *Geography*, a town of France, 4 miles S.W. from Paris.

BILLARD, or BILLET, in *Ichthyology*, an English name, in some places, for the young coal-fish, *gadus carbonarius*, when a year old; measuring at that time from 8 to 10 or 15 inches in length.

BILLAU, in *Geography*, a river of Silesia, which runs into the Neyss, near the town of Neyss.

BILLE', a town of France, in the department of the Ille and Vilaine, and the chief place of a canton, in the district of Fougeres, 1¾ league south of Fougeres.

BILLEKA, a town of Poland, in the palatinate of Lemberg, 10 miles east of Lemberg.

BILLERBEECK, a town of Germany, in the circle of Westphalia, and bishopric of Munster, 5 miles N.N.E. from Coesfeld.

BILLERICA, a township in Middlesex county, Massachusetts, in America, incorporated in 1655, containing 1200 inhabitants, lying 20 miles north of Boston, and watered by Concord and Shawsheen rivers, which run north-easterly into Merrimack river.

BILLERICAY, in *Geography*, a market-town of Essex, England; is built on a fine eminence, commanding a view of a rich vale between the town and the river Thames. Though enjoying the advantage of a weekly market on Tuesdays, it is only a hamlet in the parish of Great Burstead, the church of which is situate about one mile and a half south of this place. For the accommodation of the inhabitants, a chapel is endowed and supported in the town. Here are two annual fairs: and the whole parish contains 250 houses, and 1472 inhabitants. Billericay is 23 miles N.E. from London. Morant's history of Essex.

BILLESDON. See BILSTON.

BILLET. See HEADBOROUGH.

BILLET, or BILLETTE'E, in *Heraldry*, signifies a figure whose length exceeds its breadth: when the arms are charged with several of them, they are then called *Billettée*. The royal arms of Nassau, prince of Orange, is *Jupiter Billettée sol, a lion rampant of the last.* Authors differ much in regard to the antiquity of the billet, which was evidently a piece of wood cut in the form of a parallelogram, and retains that name and shape to this day.

BILLET, *Billette*, in the *French Customs*, a little sign in form of a cask, hung up at places where toll is to be paid, to advertise passengers and carriages, that before they advance farther, the dues are to be paid to the king, or the lord who is charged with the care of repairing the highways.

BILLETS *for fuel*, are small pieces of wood, which must be 3 feet 4 inches long, and 7½ in compass, &c. Justices of peace shall enquire, by the oaths of six men, of the assize of billets; and those which are under size are forfeited to the poor. Stat 43 Eliz. c. 14. 9 Ann. c. 15. 10 Ann. c. 6. See FUEL.

BILLETS *of gold*, denote wedges or ingots of gold, mentioned in the stat. 27 Ed. 3. c. 27.

BILLETING *of soldiers*, in *Military Language*, is the lodging or quartering of them in the houses of the inhabitants of a place. This is done by a ticket, called a *billet*, which entitles each soldier, by act of parliament, to candles, vinegar, salt, and either small beer or cyder, not exceeding five pints per day, gratis; with the use of fire, and the necessary utensils for dressing and eating their meat.

BILLETING, among *Sportsmen*, denotes the ordure and dung of a fox.

BILLETINS. See BROTHERS of *Charity*.

BILLI, JAMES DE, in *Biography*, a French Jesuit, was born in Compiegne in 1602, and entered the society of Jesuits in 1619. He taught philosophy for three years, and was a preacher for more than twenty years. He was rector of Chalons, Langres, and Sens; but he is best known by his mathematical writings, which are as follow: "Nova Geometriæ Clavis Algebra," Paris, 1643, 4to.; "Tabulæ Lodoicæ de doctrina eclipseon," Dijon, 1658, 4to.; "Tumulus Astrologiæ Judiciariæ," Paris, 1659, 4to.; "Diophantus Geometra," Paris, 1660, 4to.; "Opus Astronomicum, &c." Dijon, 1661, 4to.; "Décours de la Comete qui a paru l'an 1665, au mois d'Avril," Paris, 1665, 4to.; "Crisis Astronomica de motu Cometarum," Dijon, 1666, 8vo.; "Doctrinæ analyticæ inventum novum," Toulouse, fol. Moreri.

BILLIARDS, an ingenious kind of game played with two small ivory balls, on an oblong table, covered with green cloth, and placed exactly level; which balls are driven, by sticks made on purpose, alternately against each other, with a view to push the passive ball into hazards, or holes, on the edges and corners, according to certain laws or conditions of the game.

The word comes from the French *billiard*, of *bile*, the ball made use of; and that from the Latin *pila*, a *ball*.

This game was invented by the French, and practised by the Germans, Dutch, and Italians; and is now a favourite diversion among persons of the first rank in many parts of England. The table on which it is played is about 12 feet long, and 6 wide; and not only covered with green cloth, but surrounded with cushions to prevent the balls from rolling off, and to make them rebound. It has six holes, nets, or pockets, which are fixed on the four corners, and in the middle, opposite to each other, for receiving the balls, which, when put into these holes, are called hazards. The making of a hazard, or putting the adversary's ball into the hole at the usual game, is reckoned for two in favour of the player.

The game is played with sticks, called maces, or with cues. The mace is a long straight stick, with a head at the end, and is the most powerful instrument of the two: the cue is a thick stick decreasing gradually to a point of about half an inch in diameter: this instrument is played over the left hand, and supported by the forefinger and thumb. This is the only instrument in vogue abroad, and is used with astonishing address by the Italians, and some of the Dutch; but in England the mace is the prevailing instrument, though regarded with some degree of contempt by foreigners, as the use of it does not require so much address as the cue; however, the mace is used for the peculiar advantage of "trailing," as it is called; or of following the ball with it to such a convenient distance from the other ball as to make it an easy hazard. The several degrees of trailing are variously denominated by the connoisseurs; e. g. the shove, the sweep, the long stroke, the trail, and the dead

trail

trail or turn up, all which ſecure certain advantages to a good player; and even the butt-end of the cue becomes very powerful, when it is made uſe of by a good trailer. The varieties of this game are denominated the "white winning game," the "white loſing game," the "red or carambole winning game," and the "red loſing game." The game uſually played is the firſt of theſe, and 12 is the number. The rules for this game are as follow; 1. String for the lead and choice of balls; the perſon who does this muſt ſtand within the limits of the corner of the table, and not place his ball beyond the ſtringing nails or ſpots: the lead is won by him who brings his ball neareſt the cuſhion. 2. If after the firſt perſon has ſtrung for the lead, the adverſary ſhould make his ball touch the other, he loſes the lead; and if the player holes his own ball in ſtringing or leading, he loſes the lead. 3. If the leader follows his ball with either mace or cue beyond the middle hole, it is no lead; and it is at the option of his adverſary to make him lead again. 4. The ſtriker who plays at the lead muſt ſtand with both his feet within the limits of the corner of the table, and not place his ball beyond the ſtringing nails; and his adverſary (only) is bound to ſee that he ſtands and plays fair; otherwiſe the ſtriker wins all the points he made by the ſtroke. 5. When a hazard has been loſt in either of the corner holes, the leader is obliged, if his adverſary require it, to lead from the end of the table, where the hazard was loſt; but if the hazard was loſt in either of the middle holes, it is at the leader's option to lead from either end of the table. 6. If the ſtriker does not hit his adverſary's ball, he loſes one point; and if by the ſaid ſtroke his ball ſhould go into a hole, over the table, or on a cuſhion, he loſes three points; and he alſo loſes the lead. 7. If the ſtriker holes his adverſary's ball, or forces it over the table, or on a cuſhion; or if he holes both balls, or forces them over the table, or on a cuſhion; in either caſe he loſes two points. 8. No perſon has a right to take up his ball without permiſſion from his adverſary. 9. If the ſtriker ſhould touch or move his own ball, without intending to make a ſtroke, it is deemed an accident; and his adverſary, if he require it, may put the ball back in the place where it ſtood. 10. If the ſtriker force his adverſary's ball over the table, and his adverſary ſhould chance to ſtop it, ſo as to make it come on the table again, the ſtriker wins two points; if the ſtriker ſhould force his own ball over the table, and his adverſary ſhould chance to ſtop it ſo as to make it come on the table again, the ſtriker loſes nothing by the ſtroke, and has the lead; but if the ſtriker miſſes the ball and forces it over the table, and it ſhould be ſtopped by his adverſary, he loſes one point, and has the lead, if he chuſes. 11. If the ſtriker, in playing from a cuſhion or otherwiſe, by touching the ball, makes his mace or cue go over or beyond it, he loſes one point; and, if his adverſary require it, he may put the ball back, and make him paſs the ball. 12. If the ſtriker, in attempting to make a ſtroke, doth not touch his ball, it is no ſtroke; and he muſt make another trial; but if when the balls are near each other, the ſtriker ſhould accidentally make his ball touch the other, it is a ſtroke, though not intended. 13. If the ſtriker who plays the ſtroke ſhould make his adverſary's ball go ſo near the brink of a hole, as to be judged to ſtand ſtill, and afterwards fall into it, the ſtriker wins nothing; and the ball muſt be put upon the ſame brink where it ſtood, for his adverſary to play from the next ſtroke. 14. If the ſtriker's ball ſhould ſtand on the brink or edge of a hole, and if in playing it off he ſhould make the ball go in, he loſes three points. 15. If a ball ſhould ſtand on the brink or on the edge of a hole, and ſhould fall into the hole, before or when the ſtriker has delivered his ball from the mace or cue, ſo as to have no chance for his ſtroke, in that caſe the ſtriker and his adverſary's ball muſt be placed in the ſame poſition, as nearly as poſſible, and the ſtriker muſt play again. 16. The ſtriker is obliged to paſs his adverſary's ball, more eſpecially if he miſſes the ball on purpoſe; and it is at the option of his adverſary to oblige him to place the ball where it ſtood, and play until he has paſſed. 17. If the ſtriker plays both balls from his mace or cue, ſo that they touch at the ſame time, it is deemed a foul ſtroke; or if the adverſary diſcover it, and a diſpute ſhould ariſe, an appeal may be made to the company preſent; and the marker, if required, muſt go round the table to each perſon ſeparately, and aſk if he has any bet depending, and if he underſtands the game and the diſputed ſubject; and if the company and marker determine it to be a foul ſtroke, it is at the adverſary's option (if not holed) either to play at the ball, or to take the lead; but if the adverſary doth not diſcover it to be a foul ſtroke, the ſtriker may reckon all the points he made by the ſaid ſtroke, and the marker is obliged to mark them: and no perſon has a right to diſcover to the player whether a ſtroke be fair or foul, unleſs he is aſked. 18. If by a foul ſtroke the ſtriker ſhould hole his adverſary's ball, he loſes the lead; but if by ſuch a ſtroke he holes his own or both balls, or forces his own or both over the table, or on a cuſhion, he loſes two points. 19. If the ſtriker plays on a ball when it is running or moving, it is deemed a foul ſtroke; and if he plays with both feet off the ground, without leave of his adverſary, it is a foul ſtroke: if he plays with a wrong ball, he loſes the lead, if his adverſary require it. 20. If the ball ſhould be changed in a hazard, or on a game, and it is not known by which party, the hazard muſt be played by each party with their different balls and then changed. 21. If the ſtriker plays with his adverſary's ball, and hole, or forces the ball at which he played over the table, &c. it is deemed a foul ſtroke. 22. If the ſtriker plays with his adverſary's ball and holes, or forces the ball with which he played over the table, &c. he loſes two points; and if he miſſed the ball, three points. 23. If the ſtriker plays with his adverſary's ball and miſſes it, he loſes one point; and if his adverſary diſcovers that he hath played with the wrong ball, he may part the balls, and take the lead if he pleaſes. 24. In all theſe caſes of the ſtriker's playing with the wrong ball (if diſcovered), his adverſary muſt play with the ball, at which the ſtriker played throughout the hazard, or part the balls and take the lead. 25. Whoever ſtops a ball when running with hand, ſtick, or otherwiſe, loſes the lead, if his adverſary does not like the ball he has to play at the next ſtroke. 26. Whoever retains his adverſary's ſtick when playing, it is deemed foul. 27. If the ſtriker ſtops or puts his ball out of its courſe, when running towards either of the holes, and, if adjudged by the marker and company to be going into a pocket, if he miſſes the ball he loſes one point, and if going into a hole by the ſame ſtroke, three points. 28. If the ſtriker ſtops or puts his adverſary's ball out of the courſe, when running towards or into a hole, or puts it into a hole, it is deemed a foul ſtroke. If the adverſary does the ſame, as in the foregoing caſes, he is ſubject to the ſame penalties as the ſtriker. 29. He who ſhakes the table when the ball is running, or throws his ſtick acroſs the table, ſo as to occaſion any detriment to his adverſary, or blows on the ball when running, makes in either caſe a foul ſtroke; and if his own ball was running towards or near the hole, when he blows on it, he loſes two points. 30. He who leaves the game before it is finiſhed, and will not play it out, loſes the game. 31. Any perſon, whilſt playing, may change his mace or cue; and neither party has a right to object to either mace or cue being played within the ſaid game; but when the parties agree to play mace againſt cue,

cue, the mace-player hath no right to use a cue, and vice versâ, without leave of the adversary. 32. When a person agrees to play with the cue, he must play every ball within his reach with its point, and if he agrees to play with the butt of the cue, he must not use the point, without permission; when the parties agree to play point and point of the cue, neither has a right to use a butt during the match, without permission; but they have a right to play with a long cue over a mace, &c. and when they agree to play all points with the same cue, they have no right to use any other during the game. 33. If it be proposed to part the balls, the proposer, if the adversary agree to it, loses the lead. 34. Two missings do not make a hazard, unless the contrary is previously settled. 35. The betters are to abide by the players on the determination of the hazard, or on the game; and they have a right to demand their money, when their game is over, to prevent disputes. 36. The striker has a right to command his adversary not to stand facing him, or near him, so as to annoy or molest him in the stroke. 37. Each person is to attend to his own game, without asking questions. 38. No person in the room has a right to lay more than the odds on a hazard or game; and in questionable cases appeal should be made to the marker, or to the table of odds hung up in the room. 39. When four persons play, the game is fifteen in number; and each party has a right to consult with and direct his partner in any matter respecting the game, &c.

The "white losing-game" is the common winning-game, and twelve is the number. This depends entirely upon the defence, and the knowledge of the degree of strength with which each stroke should be played, either to defend or make a hazard; for if a person who has a competent knowledge of the game should not have a hazard to play at, he must endeavour to lay his own ball in such a position, that his adversary may not have one to play at the next stroke. In this game, if the striker misses the ball, he loses one, and if by the same stroke his ball goes into a hole, he loses three points; if he strikes his adversary's ball he loses two points; if either or both balls be forced over the table, or on a cushion, nothing is reckoned, and the striker loses the lead, but if he misses his adversary's ball, and forces his own over the table, &c. he loses one point and the lead; if either of the parties forces either or both balls over the tables, he reckons nothing, and the striker loses the lead; if the striker holes his own ball, he wins two points; if he holes both balls, he wins four points; if he holes either ball, and forces the other over the table, &c. he only loses the lead. The "winning and losing game" is a combination of both games; in which all balls that are put in by striking first the adversary's ball, reckon towards game; and holing both balls reckons four. At this game and the losing, knocking over, or forcing the balls over the cushion, goes for nothing; the striker only losing the lead. The "choice of balls" is choosing each time which ball the player pleases, which is without doubt a great advantage, and is generally played against losing and winning.

"Bricole," is being obliged to hit a cushion, and make the ball rebound or return to hit the adversary's ball, otherwise the player loses a point. This is a great disadvantage, and is reckoned between even players to be equal to receiving about eight or nine points.

"Carambole," is a game newly introduced from France. It is played with three balls, one being red, which is neutral, and is placed upon a spot on a line with the stringing nail, (*i. e.* that part of the table from whence the player strikes his ball at first setting off, and which is generally marked with two brass nails). Each antagonist, at the first stroke of a hazard, plays from a mark which is upon a line with it at the other end of the table. The chief object at this game is, for the player to hit with his own ball the two other balls: which is called a *carambole*, and by which the player wins two. If he puts in the red ball he gets three, and when he holes his adversary's ball he gets two; so that seven may be made at one stroke, by caramboling and putting in both balls. This game resembles the losing, depending chiefly upon particular strengths, and is generally played with the cue. The game is sixteen up; nevertheless it is reckoned to be sooner over than the common game. The next object of this game, after making what we have distinguished by the *carambole*, is the *bauk*; that is, making the white ball, and bringing the player's own ball and the red one below the stringing nail, from whence the adversaries begin. By this means the opponent is obliged to play bricole from the opposite cushion; and it often happens that the game is determined by this situation.

"The Russian carambole," is a game that has still more lately been introduced from abroad, and is played in the following manner: The red ball is placed as usual on the spot made for that purpose; but the player, when he begins, or after having been holed, never places his ball on any particular place or spot; being at liberty to put it where he pleases. When he begins to play, instead of striking at the red ball, he leads his own gently behind it, and his antagonist is to play at which he thinks proper; if he plays at the red ball and holes it, he scores three as usual towards the game, which is twenty-four instead of sixteen points; and the red ball is put upon the spot again: at which he may strike again, or take his choice which of the two balls to push at, always following his stroke till both balls are off the table. He is entitled to two points each time that he caramboles, the same as at the other game; but if he caramboles and puts his own ball into any hole, he loses as many as he might have got had he not holed himself; for example, if he strikes at the red ball, which he holes, and at the same time caramboles and holes himself, he loses five points; and if he holes both balls when he caramboles, and likewise his own, he loses seven, which he would have got if he had not holed his own ball. In other respects it is played like the common carambole game.

"The Bar-hole," is so called from the hole being barred which the ball should be played for, and the player striking for another hole; when this game is played against the common game, the advantage for the latter, between equal players, is reckoned to be about six.

The player at the *one-hole*, though it seems to those who are not judges of the game to be a great disadvantage, has in fact the best of it; for as all balls that go into the one hole reckon, the player endeavours to lay his ball constantly before that hole, and his antagonist frequently finds it very difficult to keep one or other ball out, particularly on the leads, when the one player lays his ball (which he does as often as he can) on the brink of the hole; leading for that purpose from the opposite end, which in reality he has no right to do; for the lead should be given from the end of the table at which the hazard is made; but when a person happens to be a novice, this advantage is often taken.

"The four game," consists of two partners on each side, as the common winning game; who play by succession after each hazard, or two points lost. The game is fifteen up; so that the point or hazard is an odd number, which makes a miss at this game of more consequence than it is at another; being as much at four, six, or eight, as it is at five, seven, or nine, at the single game.

"Hazards," are so called because they depend entirely upon the making of hazards, there being no account kept of,

of any game. Any number of perſons may play by having balls that are numbered; but the number ſeldom exceeds ſix, to avoid confuſion. The perſon whoſe ball is put in, pays ſo much to the player according to what is agreed to be played for each hazard; and the perſon who miſſes, pays half the price of a hazard to him whoſe ball he played at. The only general rule is, not to lay any ball a hazard for the next player, which may be in a great meaſure avoided, by always playing upon the next player, and either bringing him cloſe to the cuſhion, or putting him at a diſtance from the reſt of the balls. The table, when hazards are played, is always paid for by the hour.

BILLIAT, in *Geography*, a town of France, in the department of the Ain, and chief place of a canton, in the diſtrict of Nantua, 2¾ leagues S. E. of Nantua.

BILLICHA, in *Ancient Geography*, a river of Aſia in Meſopotamia, which riſes in the mountains of Oſroène, ſouth of Edeſſa, and purſuing a ſouth-eaſterly courſe, diſcharges itſelf into the Euphrates, at the town of Nicephorum.

BILLIGHEIM, in *Geography*, a town of Germany, in the palatinate of the Rhine, 4 miles S. of Landau, and 16 S. W. of Spire.

BILLIGRATZ, a town of Germany, in the duchy of Carniola, 4 leagues N. of Laubach.

BILLINGEN, a town of the Netherlands, in the duchy of Luxemburg, 20 miles E. of Spa.

BILLINGSGATE, a fiſh-market of London, kept every day, and the toll of which is appointed by ſtatute. All perſons buying fiſh in this market may ſell the ſame in any other market by retail, but none but fiſhmongers are allowed to ſell it in ſhops: and if any perſon ſhall buy any quantity of fiſh at Billingſgate for others, or any fiſhmonger ſhall engroſs in the market, they incur a penalty of 20l. Fiſh imported by foreigners ſhall be forfeited, and the veſſel &c. 10 & 11 Wil. III. c. 24. 1 Geo. I. ſtat. 2. c. 18. § 1. &c.

BILLINGSPORT, a place on the river Delaware, in America, ſituate 12 miles below Philadelphia, which was fortified in the late war, for the defence of the channel, and oppoſite to which were ſunk frames of timber, headed with iron ſpikes, called chevaux-de-frize, in order to prevent the Britiſh ſhips from paſſing. After the war they were raiſed by a curious machine, invented at Philadelphia for this purpoſe.

BILLIS, in *Ancient Geography*, a ſmall river of Aſia Minor, on the frontiers of Paphlagonia, on the borders of which was ſeated the town of Teium, mentioned by Salluſt.

BILLITON, in *Geography*, one of the Sunda iſlands in the Indian ocean, N. E. of the lower part of Sumatra, and E. of Banca. (See *Straits* of BANCA.) S. lat. between 2° 30′. and 3° 30′. E. long. between 107° 45′. and 108° 26′.

BILLOM, a town of France, and principal place of a canton, in the diſtrict of Clermont, and department of Puy-de-Dome, 4 leagues E.S.E. from Clermont. The town contains 5,110 inhabitants, and the canton 13,711. The territorial extent comprehends 115 kiliometres, and 10 communes. N. lat. 45° 45′. E. long. 3° 14′.

BILLON, BILLIO, in *Coinage*, a kind of baſe metal, either of gold or ſilver, in whoſe mixture copper predominates.

The word is French, formed, according to Menage, from the Latin *bulla*, or *bullo*, *bullion*. According to M. Boutteroue, billon of gold is any gold beneath ſtandard, or twenty-one carats; and billon of ſilver, all below ten penny-weights. But, according to others, and among the reſt, M. Boizard, gold and ſilver beneath the ſtandard, as far as twelve carats, and ſix penny-weights, are properly baſe gold and ſilver, and all under thoſe billon of gold, and billon of ſilver, becauſe copper is the prevailing metal. The writers on numiſmatic ſcience appropriate the term billon to ſignify metals of copper alloyed with a very ſmall quantity of ſilver.

BILLS, in *Geography*, a rock in the Atlantic, near the weſt coaſt of Ireland, 6 miles N. W. from the iſland of Clare, and 6 S. S. E. from Achill-head.

BILLY, JAMES DE, in *Biography*, was born in 1535, at Guiſe in Picardy, and devoting himſelf to ſtudy, he entered the church, in which he poſſeſſed ſome benefices. After ſuffering conſiderably in the civil wars, he retired to Paris, and died in the houſe of his friend Gilbert Genebrard, in 1581. His works, both in proſe and verſe, were numerous; but the moſt valuable are his Latin tranſlations of the Greek fathers: ſuch are, "S. Gregorii Nazianzeni opera omnia," fol. 1569 and 1583; "Interpretatio Latina 18 priorum libri S. Irenæi adv. Hæreſ. capitum," fol. 1577; "S. Joh. Damaſceni opera," fol. 1577; "Iſidori Peluſiotæ Epiſtolæ, Gr. & Lat. (3 firſt books,) fol. 1587;" and tranſlations of ſome pieces of St. Chryſoſtom, inſerted in the Paris editions of his works, in 1581, &c. Moreri.

BILLY, in *Geography*, a town of France, in the department of the Allier; 4½ leagues N. E. from Gannat.

BILMA, a deſert country in the north of Africa, being a part of the Great Deſert, or Sahara, and a prolongation of the Libyan deſert to the S. W. bounded on the N. by the Tibeſti mountains, and the deſert of Berdoa, on the E. by Kawar or Kuar, on the S. by Bornou, and on the W. by Zegzeg, Agades, Aſouda, Ganat, &c. N. lat. about 23° to 25°. W. long. about 20°. The ſalt lake of Dumboo, the Chelonides Palus of Ptolemy, is ſaid to be ſituated in the deſert of Bilma.

BILOBUS, in *Entomology*, a ſpecies of SCARABÆUS, with two prominent lobes on the thorax; a ſimple horn on the head, and wing-caſes ſtriated. Inhabits the ſouth of Europe. Fabricius.

BILOBUS, a ſpecies of DYTISCUS, of an oblong-ovate form and black; mouth, vertical two-lobed ſpot, thorax, ſutural line, baſe, and margin of the wing-caſes yellow. Linn. Muſ. Leſk.

BILOBUS, a ſpecies of CIMEX (*Spinoſus*), with an obtuſe-dentated thorax; wing-caſes greyiſh or reddiſh; vent with two lobes. Linn. Muſ. Leſk. A native of Europe.

BILOBUS, in *Ornithology*, a ſpecies of CHARADRIUS, called the *Wattled Plover*, by Latham. It is an inhabitant of the coaſt of the Malabar. The bill and legs are yellow; frontal ſkin naked, and pendulous in two pointed lobes; body above yellowiſh grey; beneath white. Gmelin, &c. The crown, band on the tail, and quill-feathers are black; band acroſs the eyes, greater wing-coverts, and ſome of the tail-feathers at the end white. This is *Pluvier à lambeaux* of Buff. Hiſt. Oiſ. and *Pluvier de la côte de Malabar* of Pl. enl. of the ſame author. Length nine inches and a half.

BILOCULAR, in *Botany*, a term applied to a *capſule*, having two cells.

BILOIYAR, in *Geography*, a town of Ruſſia, in the government of Simbirſk, on the eaſt ſide of the Volga, 16 miles S. E. of Simbirſk.

BILS, or BILSIUS, LOUIS DE, of Rotterdam, in Holland, in *Biography*, acquired much fame for a time, about the middle of the 17th century, for a ſuppoſed new method of preſerving bodies from putrefaction, and of diſſecting them without occaſioning an effuſion of blood. By his method of preparing the bodies, they were ſaid to preſerve their flexibility as well as freedom from putridity for ages; ſo that they

they might be diſſected during the ſummer, and remain under the demonſtrator's hands for weeks, months, or years, if neceſſary, without emitting any offenſive ſmell. De Bils had the art of gaining ſo much credit to his profeſſions, that he is ſaid, by Haller, to have ſold his ſecret to the univerſity of Louvain for 22,000 florins. He had demanded a much larger ſum, and certainly had his preparations anſwered the high elogia beſtowed on them by his favourers, the ſecret would have deſerved it. Prior to the ſale he had ſent one of his bodies to the theatre at Leyden, at which Deuſingius, one of his warmeſt admirers ſays, "ſed fidem ſuperat omnem, exſiccatum hominis cadaver, recenter mortuum diceres, tanto theatro digniſſimum opus." De admiranda anatome, nobiliſſimi viri L. D. Bils, p. 362. But not contented with the fame and money acquired by his ſecret, for he ſold his prepared bodies at high prices, he pretended to have made diſcoveries in the ſtructure of the liver, and in the lymphatics, by which he expoſed himſelf to deſerved contempt, it appearing that he was totally ignorant of the art of anatomy, in which he affected to be a maſter. He is ſaid to have died phthiſical from the effects of the putrid air inhaled while preparing his bodies, and in a few years his preparations, which were to have laſted for ages, were totally deſtroyed. His productions, which were numerous, and excited much intereſt at the time, were collected and publiſhed in 1692, in 4to. under the title of, "De Bils inventa anatomica antiquo-nova cum clariſſimorum virorum epiſtolis, et teſtimoniis, ubi annotationes Joannis ab Hoorne, et Pauli Barbette, refutantur, interprete Gedeone Buenio. Amſt.

BILSAH, in *Geography*, a city of Hindooſtan, and capital of a circar in the Malwa country; 416 miles S. W. of Benares, 867 N. W. of Calcutta, by Gurry Mundlah, 560 N. W. of Hydrabad, 367 S. W. of Lucknow, 249 N. W. of Nagpour, 140 nearly E. of Ougein, and 496 N. E. of Poonah. Bilſah, which is almoſt in the heart of India, affords tobacco of the moſt fragrant and delicious kind throughout that whole region, and which is diſtributed accordingly. N. lat. 23° 30'. E. long. 77° 53'.

BILSEN, a town of Germany, in the circle of Weſtphalia, and biſhopric of Liege, chief place of a canton in the diſtrict of Maeſtricht, and department of the Lower Meuſe, ſeated on the Demer, poſſeſſing the privileges of a city, but of no great conſideration, 14 miles N. of Liege. The town contains 1925 perſons, and the population of the canton includes 9388. The territory comprehends 170 kiliometres, and 16 communes.

BILSKOI, a town of Siberia, on the Bilaia, 90 miles N. W. of Irkutſk.

BILSON, Thomas, in *Biography*, a learned prelate of the Engliſh church, was born at Wincheſter, and educated at Wykeham's ſchool near his native city. In 1565, he was admitted fellow of New College, Oxford, after having ſerved two years of probation. He took in due courſe his ſeveral degrees of bachelor and maſter of arts, and alſo of bachelor and doctor of divinity; the laſt of which was conferred on him in 1580. In his earlier years he was fond of poetry, philoſophy, and phyſic; but after having entered into orders he confined himſelf wholly to divinity, and became an excellent preacher. His firſt preferment was the maſterſhip of Wincheſter ſchool; and he afterwards became prebendary of Wincheſter, and at length warden of the college, in which office he was inſtrumental in preſerving the revenues of it, when they were likely to have been loſt by forgery. In 1585, he publiſhed a treatiſe entitled "The true Difference between Chriſtian Subjection and unchriſtian Rebellion," dedicated to queen Elizabeth, and compoſed for the purpoſe of confuting thoſe catholic writers who attacked her right to the throne, and to the allegiance of her ſubjects. In this treatiſe paſſages occur that are favourable to reſiſtance in certain caſes, and which have not eſcaped the cenſures of later advocates of paſſive obedience. This was ſucceeded, in 1593, by his "Perpetual Government of Chriſt's church, &c." deſigned to ſhew, that from the Moſaic inſtitution to the modern ages of Chriſtianity, the church has been governed by paſtors and teachers of different ranks, ſuperior and ſubordinate, and eſteemed one of the beſt books in favour of epiſcopacy. In conſequence of this publication he was promoted to the ſee of Worceſter in 1596, from which he was tranſlated in 1597 to that of Wincheſter, when he was alſo appointed a privy counſellor. About this time he delivered a courſe of ſermons at Paul's croſs, againſt ſome of the tenets of the Puritans, on the ſubject of redemption, and the deſcent of Chriſt into hell, which occaſioned a controverſy with the leaders of that ſect. In the courſe of this controverſy the biſhop maintained the actual deſcent of Chriſt into hell, or the place of the damned, an opinion which was then deemed orthodox, but which has ſince been rejected by the beſt expoſitors of the 39 articles, and by every rational divine. This prelate took a lead in the Hampton-court conference, where he was diſtinguiſhed by his learning; and in general he was one of the moſt able advocates in favour of the church of England. To him, in conjunction with Dr. Smith, afterwards biſhop of Glouceſter, was committed the care of reviſing and finiſhing the new verſion of the Scriptures, called king James's Bible. He was alſo one of the delegates who pronounced the ſentence of divorce between the earl of Eſſex and his counteſs. This learned biſhop, whoſe life was a courſe of inceſſant labour for the public good, and whoſe private character uniformly correſponded with his high ſtation, died in 1616, and was buried in Weſtminſter Abbey. Biog. Brit.

BILSTEIN, in *Geography*, a town of Germany, in the circle of the Lower Rhine, and capital of a bailiwick, in the duchy of Weſtphalia, ſeated on a mountain; 42 miles E. of Cologn.

BILSTON, a large village, or chapelry, of Staffordſhire, England, is remarkable for the number of its houſes and inhabitants, without having the advantage of a chartered market or fair. From its proximity to Birmingham and Wolverhampton, and having the advantage of a navigable canal near it, Bilſton abounds with manufactures, among which thoſe for japanned and enamelled goods are the principal. Furnaces for ſmelting iron ore, forges and ſlitting mills, moſtly worked by ſteam engines, alſo abound here. In the vicinity of the town are ſeveral coal mines, which produce great quantities of that foſſil. An orange coloured ſand is alſo abundant, and is in much requeſt by the artizans, as a ſand to caſt metals in. Here is a quarry of remarkable ſtones, lying horizontally in twelve ſtrata, each progreſſively increaſing in thickneſs from the top downwards. The ſtone is moſtly appropriated to the making of ciſterns, troughs, &c. Bilſton is in the pariſh of Wolverhampton, but is a diſtinct townſhip for all parochial proceedings. There is a chapel of modern erection; alſo two meeting-houſes, and a free-ſchool. This chapelry is within the exempt juriſdiction of the dean of Wolverhampton, and is a perpetual curacy. Bilſton is 127 miles N.W. from London: it contains 1305 houſes, and 6914 inhabitants. Shaw's Hiſtory of Staffordſhire.

Bilston, or Bildston, is a ſmall manufacturing town of Suffolk, England. The making of blue cloths, blankets, and yarn, give employ to moſt of the inhabitants. Here was formerly a conſiderable market on Wedneſdays, but it is

is nearly deserted, and the whole town is much reduced. Here are two annual fairs. The parish contains 121 houses, and 744 inhabitants.

BILUR, in *Natural History*, a name given by many of the Arabian writers to a gem, which though they often mention, yet they have no where given us a description of. Some have imagined it the *onyx*, and others the *beryl*; but it appears more probable to have been a species of crystal; probably the pebble-crystal of the East Indies, which is considerably finer than the common sprig-crystal, and is often sold under the name of the white sapphire; though considerably inferior, both in lustre and hardness, to the true white sapphire.

BIMA, in *Geography*, a river of Hindoostan, so called by Mr. Pennant. See BEEMAH.

BIMACULARIS, in *Entomology*, a species of PHALÆNA (*Pyralis*, Gmel.), found in Europe. The anterior wings are griseous brown, with two brown spots. Linn.

BIMACULATA, in *Conchology*, a species of TELLINA, found in the European and American seas. This shell is of a somewhat rotundated triangular shape, rather broad, smooth, whitish, with two sanguineous spots within. It is a small shell, being usually half an inch in length, and sometimes, though rarely, of a yellowish colour. Linnæus, Donovan Brit. Shells, &c. On the English coasts this is a scarce species.

BIMACULATA, in *Entomology*, a species of SILPHA, found in Barbary. It is ovate and black; head of the antennæ, globose; legs ferruginous. Gmelin. The margin of the thorax is rather ferruginous, and the middle of each wing-case is marked with a red spot.

BIMACULATA, a species of CHRYSOMELA, of an oblong shape, and black; wing-cases testaceous, with a black spot on each. Inhabits America. Fabricius.

BIMACULATA, a species of LEPTURA, of a rufous colour, with cylindrical thorax; wing-cases dotted, with a spot and undulated streak of white on each. Schæffer, &c.

BIMACULATA, a North American species of CANTHARIS, with a ferruginous thorax; having a black spot, wing-cases testaceous, with a black spot at the tip. Fabricius.

BIMACULATA, a species of MORDELLA, of a large size, that is found in Hungary. It is ferruginous, with the breast black; wing-cases testaceous, with a black spot on each. Fabricius. Mant. Inf.

BIMACULATA, a species of BUPRESTIS, that inhabits India. The wings are very entire, striated, with a red spot; body brownish, green. Linn. Fabr. &c.

BIMACULATA, a species of SPHINX (*Zygæna*), of the middle size, that inhabits America. The wings are above and beneath black, with two yellow spots on the anterior wings. Gmel. Fabr. &c.

BIMACULATA, a species of PHRYGÆNEA, described by Degeer. The wings are brown, with a double yellow lateral spot. Linn. &c.

BIMACULATA, a species of TIPULA, found in Europe. The wings are hyaline, with two brown spots; abdomen spotted, with ferruginous in the middle; antennæ feathered. Linn. Fn. Suec. Obs. This specific character is liable to some exception, for it is only the female which has the abdomen spotted with ferruginous; that of the male is immaculate.

BIMACULATA, a species of MUSCA, found in New Holland, and described by Swederus, Nov. Act. Stockh. The colour is light blue, with a whitish spot on each side of the breast: abdomen green, and blue at the base.

BIMACULATA, a species of SCOLIA, described by Fabricius. It is black, hairy, with two pale yellow spots, antennæ yellow. A variety of this insect with fulvous, instead of yellow spots, is mentioned by Pelagn. Inf. Calabr. The former inhabits North America.

BIMACULATA, a species of ARANEA, of a small size, that is found in Europe. The abdomen is subrotund, chestnut with two white spots. Gmelin. Abdomen rather depressed.

BIMACULATA, a species of TENTHREDO, of a pale colour, with the eyes, base of the abdomen above, and two spots on the breast, black. Linnæus Mus. Lesk.

BIMACULATA, in *Zoology*, a species of LACERTA, described by Sparmann. Nov. Act. Stockh. The tail is carinated, toothed, and twice the length of the body; all the toes lobated. Inhabits the woods of St. Eustace and Pennsylvania, living under ground, or in the hollows of trees, and depositing its eggs in the earth. The body is blue, tinged with green, and thickly spotted with black, but having two larger than the rest on the shoulders, from whence it is specifically named *bimaculata*; on each foot are five toes.

BIMACULATUM, in *Entomology*, a species of PHALANGIUM, with the abdomen black, and two white spots. A native of England and Norway. Gmelin.

BIMACULATUS, a species of SCARABÆUS, with three slight tubercles on the head; wing-cases striated, with two red spots at the base. Inhabits Germany. Fabricius.

BIMACULATUS, a species of HISTER, of a black colour, with the posterior end of the wing-cases red. Linn. Fn. Suec. Found in the dung of oxen. This is *Hister sinetarius* of Scopoli; and *Attelabus totus niger; elytris lævis nonnihil striatis*; *Pescarbot noir* of Geoffroy.

BIMACULATUS, a species of CURCULIO, of a brown colour: wing-cases dotted with cinereous; snout and legs black. Inhabits Saxony; and resembles *Curculio colon*, but is rather smaller.

BIMACULATUS, a species of CRYPTOCEPHALUS, of a dusky black, with fulvous thorax, and testaceous wing-cases, with two spots of black. Fabricius. Obs. This is *Chrysomela melanocephala* of Schaller, &c. A native of Italy and Saxony.

BIMACULATUS, a species of CARABUS, of a black colour, with a common interrupted band; antennæ and feet testaceous. Mant. p. 532. Gmel. Inhabits India. The thorax of this insect is yellow, or black, and sometimes spotted in different specimens.

BIMACULATUS, a species of DYTISCUS, of a testaceous colour, with a blackish spot on the wing-cases. Inhabits France. Size of a grain of rice. Gouan. Gmelin, &c.

BIMACULATUS, a species of GRYLLUS (*Bulla acridium*) found in Europe, and described by Herbst. The thorax is brown, with an ochraceous lunule on each side.

BIMACULATUS, a species of ICHNEUMON. Colour black; front, legs, antennæ beneath, anterior part of the thorax, two spots on the wings, and posterior margin of the abdominal segments, except the second, yellow. Linn. Mus. Lesk. Breeds in the larva of phalæna fimbria. Scutel raised behind. Inhabits Europe.

BIMACULATUS, is also a species of ICHNEUMON, that inhabits Austria, and is described by Schranck. It is black, with a yellowish scutel; two last segments of the abdomen with a single gypseous spot on each above.

BIMACULATUS, in *Ichthyology*, a species of SALMO, the body of which is compressed, and marked with two spots; anal fin with thirty-two rays. Gmelin. This is a native of South America. Seba calls it *Tetragonopterus*; and Artedi *Coregonoides Amboinensis*.

BIMACULATUS, a species of LABRUS, found in the Mediterranean

diterranean sea. The dorsal fin is filamentous, body marked with a brown spot in the middle, and another near the tail. Gmel. &c.

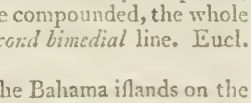
BIMACULOSA, in *Entomology*, a species of Coccinella, with fulvous wing-cases, having two obsolete white semilunar patches. Herbst. apud Fuessli, &c.

Bimaculosa, a species of Phalæna, that inhabits Germany. Colour whitish grey; anterior wings rather clouded; posterior ones with two black spots. Fabricius, &c.

BIMATRA, in *Ancient Geography*, a town of Asia in Mesopotamia. Ptolemy.

BIMBELE' *ou fausse Linotte*, in *Ornithology*, a name given by Buffon to a species of motacilla, since called by Latham the *palm warbler*, and *motacilla palmarum* by Gmelin.

BIMEDIAL, in *Mathematics*. When two medial lines, as AB and BC, commensurable only in power, and containing a rational rectangle, are compounded; the whole AC shall be irrational, with respect to either of the two, and is called a *first bimedial* line.



But if two medial lines, commensurable only in power, and containing a medial rectangle, be compounded, the whole will be irrational, and is called a *second bimedial* line. Eucl. lib. x. prop. 38 and 39.

BIMINI, in *Geography*, one of the Bahama islands on the west side of the great Bahama bank, near the gulf of Florida. Its compass is about twenty miles, and it has a good harbour. N. lat. 25°. W. long. 79° 34'.

BIMPLEPATAM, or Bimlipatan, a sea-port town of Hindoostan, on the western side of the bay of Bengal, in the circar of Cicacole, 35 miles S.S.W. of Cicacole. N. lat. 18° 10'. E. long. 83° 15'.

BIMUCRONATUS, in *Entomology*, a species of Scarabæus, that inhabits Amboyna. It is testaceous; shanks of the anterior legs large, and bearded; shield of the head mucronated on both sides, and bordered with fine hairs.

BINA, in *Geography*, a town of Italy, in the Cremonese, 10 miles N.E. from Cremona.

BINACLE, in *Sea-Language*. See Bittacle.

BINAGARA, in *Ancient Geography*, a town of India, on this side the Ganges. Ptolemy.

BINARD Island, in *Geography*, a long and narrow island on the north coast of France, to the east of Roteneuf point, having entrances at both the east and west end, and within it a sound or bay. It lies to the east of St. Maloes, towards Cancale.

BINAROS, or Vinaros, a town of Spain in Valencia, on the confines of Catalonia, near the coast of the Mediterranean, at the mouth of a river, which forms a small harbour, with anchorage at about a cannon-shot from the town, in 6 to 9 fathoms. It is surrounded with walls, and defended by some cannon; 5 miles north of Peniscola, and 20 south of Tortosa.

BINARY Number, that which is composed of two units.

Binary *Arithmetic*, a method of computation first proposed by M. Leibnitz; wherein, in lieu of the ten figures in the common arithmetic, and the progression from 10 to 10, he has only two figures, and uses the simple progression from two to two.

Jos. Pelican, of Prague, has more largely explained the principles and practice of the binary arithmetic, in a book entitled, "Arithmeticus perfectus, qui tria numerare nescit," 1712.

All his characters used in this arithmetic are 0 and 1; and the cipher, here, multiplies every thing by 2, as it does in the common arithmetic by 10. Thus, 1 is one; 10, two; 11, three; 100, four; 101, five; 110, six; 111, seven; 1000, eight; 1001, nine; 1010, ten, &c. being founded on the same principles with the common arithmetic. Hence immediately appears the reason of the celebrated property of the duplicate geometrical proportion in whole numbers; viz. that one number of each degree being had, we may thence compose all the other whole numbers above the double of the highest degree. It being here, v. gr. as if one should say 111 is the sum of 4, 2, and 1, which property may serve assayers to weigh all kinds of masses with a little weight; and may be used in coins, to give several values with small pieces. This method of expressing numbers once established, all the operations will be easy: in multiplication particularly, there will be no need for a table, or getting any thing by heart. The author, however, does not recommend this method for common use, because of the great number of figures required to express a number; adding, that if the common progression were from 12 to 12, or from 16 to 16, it would be still more expeditious: but its use is in discovering the properties of numbers, in constructing tables, &c. What makes the binary arithmetic the more remarkable is, that it appears to have been the same with that used 4000 years ago among the Chinese, and left an *ænigma* by Fohi, the founder of their empire, as well as of their sciences. M. Lagny has proposed a new system of logarithms, on the plan of the binary arithmetic; which he finds shorter, more easy, and natural than the common ones.

100	4
10	2
1	1
111	7

Binary, a time in *Music*, consisting of two crotchets, or two minims in a bar.

BINASCO, in *Geography*, a town of Italy, in the Milanese, 10 miles south of Milan.

BINATED Leaf, in *Botany*. See Leaf.

BINCHE, in *Geography*, a town of the Netherlands, in the county of Hainaut, situated in a fertile country on the river Haisne; and, according to the French distribution, a place and canton in the district of Charleroy and department of Jemappe. The town contains 3798 persons, and the population of the canton is estimated at 13,908. The extent of the territory comprehends 125 kiliometres and 16 communes. Binche was burned by Henry II. of France in 1554, and soon after rebuilt. In 1578, it was taken by John duke of Austria, and retaken in the same year by the duke of Alençon. The Spaniards regained possession of it, and ceded it to France at the peace of Aix-la-Chapelle, but the peace of Nimeguen restored it, together with its jurisdiction, including 51 towns and villages, to Spain. It is distant 8 miles E. S. E. from Mons.

BIND, in *Commerce*, contains 10 strikes of eels; each strike including 25.

Bind-*Weed*, in *Botany*. See Convolvulus.

Bind-*Weed, black*. See Tamus.

Bind-*Weed, rough*. See Smilax.

Bind-*With*. See Clematis.

BINDEN, in *Geography*, a town of Swisserland in the Valais, near the river Binna. N. lat. 46° 13'. E. long. 7° 58'.

BINDER-Ooze, the weakest kind of tan-ooze. See Tanning.

BINDING Joists, in *Architecture*. See Joists.

Binding, in the *Art of Defence*, a method of securing or crossing the adversary's sword with a pressure, accompanied with a spring from the wrist. See Beating.

Unless a man, by some kind of cross, secure, as it were, or render his adversary's sword incapable to find him during the time of his performing a lesson upon him, it is impossible for him to be certain, but that he may receive from his adversary, either a fortuitous *contretemps*, or an exchanged thrust,

thruſt, before the recovery of his body, or going off after a thruſt.

The great objection made by ſome people, particularly thoſe time-catchers, againſt the frequent uſe of *binding*, is, that when a man, in performing it, cleaves too much to his adverſary's ſword, he is liable to his adverſary's ſlipping of him, and conſequently of receiving either a plain thruſt, or one from a feint.

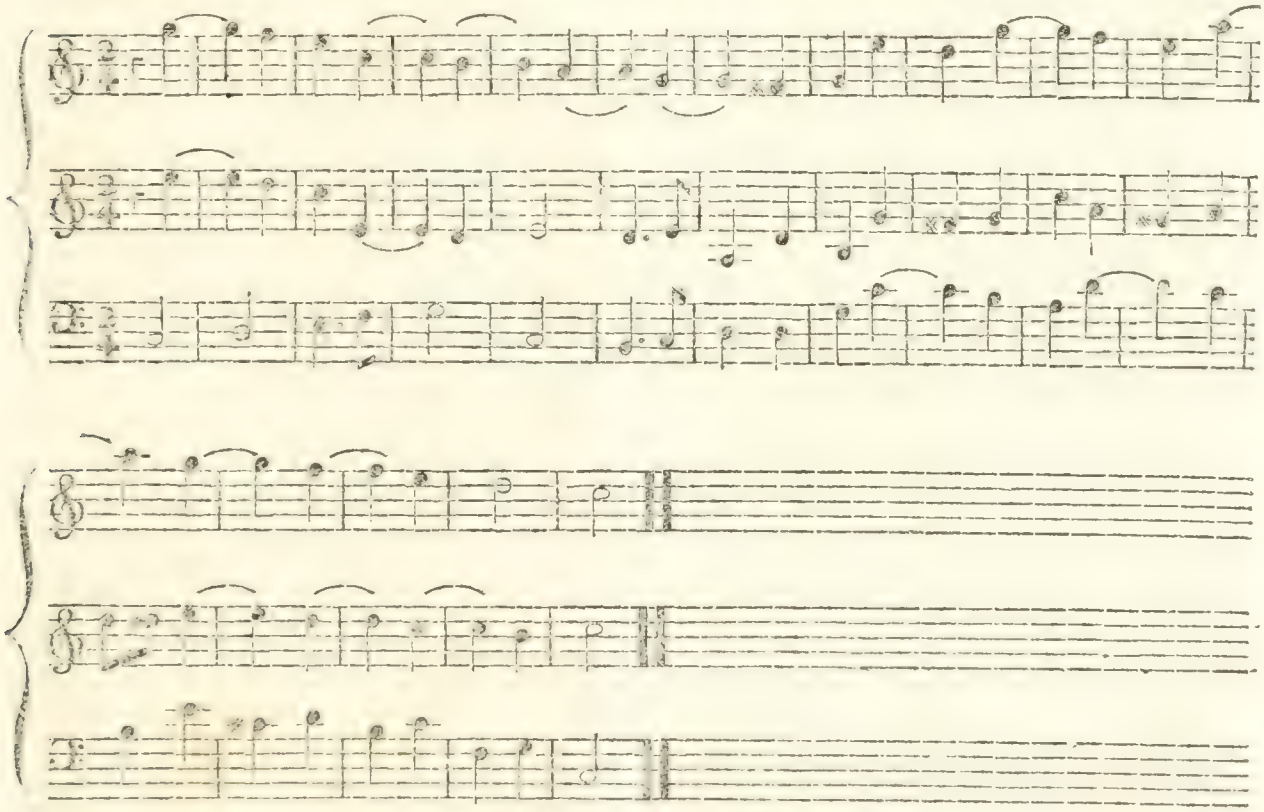
Binding is a term in *Falconry*, which implies tiring, or when a hawk ſeizes.

Binding *Books*. See Book-*Binding*.

Binding-*Notes*, in *Muſic*, imply two or more ſounds on the ſame line or ſpace, that are linked together by a ſemicircle; and which, though written or printed twice, are not to be ſeparated, but ſuſtained like a ſingle ſound.

The firſt of theſe tied or binding-notes, as in preparing diſcords, is uſually ſtruck on the unaccented part of a bar, and continued on the accented part. See Ligature, and Syncopation.

Example.



BINETTA, in *Geography*, a town of Italy, in the kingdom of Naples, and country of Bari, 4 miles W.S.W. of Bidetto.

BINGAZI. See Bengasi.

BINGE, a town of France, in the department of the Cote d'Or, and chief place of a canton in the diſtrict of Dijon, 10 miles eaſt of Dijon.

BINGEN, a town of Germany, in the circle of the Lower Rhine, and electorate of Mentz or Mayence, and by the French arrangement, the principal place of a canton, in the diſtrict of Mayence, and department of Mont-Tonnerre. The town is ſaid to contain 2663 inhabitants, and the canton 5638. It includes 10 communes. The town is ſeated at the conflux of the Nahe and Rhine. The ſtone bridge over the former is a noble ſtructure, and the adjoining country is delightful. Bingen is a very ancient town, and was once imperial. The fortifications were deſtroyed by Lewis XIV. in 1689. A great part of the corn, which is carried into the Rhinegau, the neighbouring palatinate, comes through this place, which, on the other hand, ſupplies the palatinate with drugs, and various foreign commodities. Beſides this traffic, it has in its vicinity very fruitful vineyards, which produce excellent wine. Near this town the Rhine is compreſſed into a narrow channel, between two rocks; about a mile and a half below it is a kind of whirl-pool, called the "Bingen-loch," the paſſage of which is dangerous. At a ſmall diſtance is alſo an iſland on the Rhine, denominated "Mauſtburn," or tower of rats; from a tradition, that an archbiſhop of Mentz was there devoured by theſe animals, in the tenth century, as a judgment executed on him for his cruelty to the poor, whom he compared to rats eating up the ſubſtance of the rich. Bingen is 19 miles W. of Mentz, 30 S. of Coblentz, and 54 E. of Treves. N. lat 49° 54'. E. long. 7° 33'.

BINGENHEIM, a town of Germany, in the circle of the Upper Rhine, and principality of Heſſe, 16 miles N.N.E. from Frankfort on the Mayne.

BINGHAM, Joseph, in *Biography*, a learned Engliſh divine, was born at Wakefield, in Yorkſhire, in 1668. Having acquired the rudiments of claſſical learning at a ſchool in his native town, he was admitted, in 1683, into Univerſity-college at Oxford, and in 1687 became fellow. Having taken

taken his maſter's degree in 1690, he was ſoon after preſented by Dr. Radcliffe, the celebrated phyſician, to the rectory of Headbourn-Worthy, near Wincheſter; a preferment which, though not exceeding in value 100 *l.* a year, afforded him acceſs to the valuable library at Wincheſter, and enabled him to proſecute the arduous undertaking, to which, in this retirement, he devoted much of his time and labour. Accordingly, the firſt volume of his learned work, entitled "Origines Eccleſiaſticæ, or the Antiquities of the Chriſtian Church," appeared in 1708. It was completed in ten volumes, 8vo. and contains a judicious and candid, as well as ample account of the Chriſtian clergy and churches from the earlieſt times. Beſides this work, which was the reſult of much reading and indefatigable application, he publiſhed, in 1706, "The French Church's Apology for the Church of England; or the objections of the Diſſenters againſt the Articles, Homilies, Liturgy, and Canons of the Engliſh Church, conſidered and anſwered upon the principles of the Reformed Church of France, &c." 8vo. His avowed deſign in this work was to reaſon Diſſenters "into union upon ſuch principles as are common to all the churches of the reformation." However laudable the deſign, uniformity of ſentiment is not likely to be produced by any reaſoning, as long as men are allowed to exerciſe the right of private judgment, and the only practicable union ſeems to be that which reſults from mutual forbearance and benevolence. Mr. Bingham likewiſe publiſhed "A Scholaſtic Hiſtory of Lay-Baptiſm," in two parts, 1712, 8vo.; and "A Diſcourſe concerning the Mercy of God to Penitent Sinners." All his works were collected and publiſhed in 2 vols. fol. Lond, 1725. Notwithſtanding the acknowledged learning and meritorious ſervices of Mr. Bingham, he had no other preferment beſides that above-mentioned, till the year 1712, when he was collated to the rectory of Havant near Portſmouth. He died in 1723, and was buried in the church-yard of Headbourn-Worthy, without any monument, of which he declared his diſlike in his laſt will. Biog. Brit.

Bingham, in *Geography*, a town of Nottinghamſhire, in England, ſtands nearly in the centre of the vale of Belvoir. It conſiſts principally of two ſtreets, running nearly parallel to each other, with ſome ſmaller ſtreets branching from them. Near the centre of the town is a ſpacious market-place, where a weekly market is held every Thurſday; it has alſo three annual fairs, and a large ſtatute fair yearly for hiring of ſervants. Bingham is ſtated by Thoroton to be much reduced ſince the reformation, as, previouſly to that event, it contained three chapels, excluſive of the pariſh church. The latter was collegiate, and is ſtill a large handſome ſtructure, with a tower and ſpire, ſide ailes and chancel. It contains numerous monuments, among which is a plain one inſcribed to the memory of Robert White, a native of this place, where he died, in 1773, at the advanced age of eighty. He was author of an annual publication, entitled "The cœleſtial Atlas, or New Ephemeris." The rectory of Bingham is eſteemed one of the moſt valuable in the county of Nottingham, and is in the gift of lord Cheſterfield, who is lord of the manor. This town is 124 miles north from London. It contains 220 houſes, and 1082 inhabitants.

At Aſlaſton, about two miles eaſt from Bingham, archbiſhop Cranmer was born. About two miles north from Bingham is Eaſt-Bridgeford, where are the remains of an entrenchment, and where ſome coins, urns, &c. have been found. Horſley places the Roman ſtation, Margidunum, "near Eaſt-Bridgeford," from its ſituation near the foſſe-road, and from the agreement of diſtances, between this and the other ſtations named in the Itinerary. Thoroton's Hiſtory of Nottinghamſhire.

BINGIUM, in *Ancient Geography*, a town of Gaul, in Germania Prima, weſt of Mogontiacum; now *Bingen*, which ſee.

BINGLESTEIN, in *Geography*, a town of Germany, in the circle of Weſtphalia, and biſhopric of Paderborn, 3 miles ſouth of Buren.

BINGO, a ſmall country of Japan, in the iſland of Nipon, ſituate in N. lat. about 34° 30′. E. long. 134°.

BINGUM, a town of Germany, in the circle of Weſtphalia, and county of Eaſt Frieſland, one mile north-weſt of Ort.

BINGUT Cape and Bay, lie about E. by N. from Algiers, on the coaſt of Africa, in the Mediterranean. The town of Bingut is at the bottom of the bay of its name, about 12 or 13 leagues from Algiers.

BINIESZKY, a town of Lithuania, in the palatinate of Wilna, 44 miles S. E. of Wilna.

BINN, *binna*, a ſort of cheſt or cupboard, wherein to lock up bread, meat, or other proviſions.

The word is alſo uſed for a place boarded up to put corn in. The peaſe and oatmeal, uſed at ſea, are apt to ſpoil in caſks. Dr. Hales propoſes to prevent this by putting them into large binns, with falſe bottoms of hair-cloth laid on bars, whereby freſh air may be blown upwards through them, at proper times, with ſmall ventilators.

BINNA, in *Ancient Geography*, a town of Aſſyria, according to Ptolemy.

BINNINGER, John Nicholas, in *Biography*, born at Montbelliard, in 1628, ſtudied medicine at Padua, and then went to Baſle, where he was admitted to the degree of doctor in that art in 1652. Returning to his own country, he ſoon acquired ſo much fame for his ſkill in his profeſſion, that he was appointed profeſſor of medicine, and phyſician to the family of the duke, his ſovereign. He left "Obſervationum et Curationum medicinalium, centuriæ quinque," 8vo. 1673, Montb. containing ſome curious and valuable obſervations. Haller. Bib. Med. Eloy. Dict. Hiſt.

BINNIGUET, in *Geography*, a ſmall iſland near the weſt coaſt of France, about a league ſouth-weſt of Le Conquet, and ¾ weſt of St. Matthew's point. N. lat. 48° 19′. E. long. 1° 5′.

BINN-NA-BAIRD, and Binn-na-Muick-duidh; are the names of two lofty mountains, in the pariſh of Crathy, Aberdeenſhire, in Scotland. Theſe eminences are conſtantly covered with ſnow, and extending in the ſame ridge with the Cairngoram mountain, contain the ſame ſpecies of topaz, which bears the name of Cairngoram ſtones. Emeralds have been ſometimes diſcovered here; alſo a ſpecies of brown ſilicious ſtone, which bears a very fine poliſh.

BINOCLE, or Binocular *Teleſcope*, from *binus*, *double*, and *oculus*, *eye*, in *Optics*, that to which both the eyes may be applied, and conſequently the ſame object be obſerved at the ſame time by both. It conſiſts of two tubes, with two ſets of glaſſes of the ſame power, and adjuſted to the ſame axis; and ſome have pretended that it repreſents objects much larger and clearer than a ſingle or monocular glaſs. But this is perhaps only an illuſion, occaſioned by the ſtronger impreſſion, which two equal images alike illuminated make upon the eyes. This method of conſtruction was invented by father Rheita, and brought into uſe by father Cherubin of Orleans. There are alſo microſcopes of the ſame kind, but very ſeldom uſed.

BINODIS, in *Entomology*, a ſpecies of Formica, deſcribed by Fabricius as a native of Egypt. It is black; head

head large and rufous; with two tubercles on the petiole.

BINOMINAL, or BINOMIAL, from *bis*, *twice*, and *nomen*, *name*, in *Algebra*, a quantity consisting of two terms or members, connected by the sign + *plus*, or — *minus*.

Thus $a + b$ and $5 - 3$ are binomials, consisting of the sum or difference of those quantities; though the latter is often called *residual*, and by Euclid, *apotome*.

The terms binomial and residual are said to have been first introduced by Robert Recorde. See ALGEBRA.

The powers of a binomial are found by a continual multiplication of it by itself, as often as an unit is contained in the index of the power required. Those of a residual, $a - b$, are obtained in the same manner, only with this difference in the result, that the terms in which the exponent of b is an odd number, will be negative.

If a root have three parts, as $a + b + c$, it is called a trinomial; if more, a multinomial.

BINOMIAL, *impossible*, or *imaginary*, in *Algebra*, is used for a binomial, one of the terms of which is an impossible or imaginary quantity: as $a \pm \sqrt{-bb}$ is an impossible binomial.

Dr. Maskelyne, the astronomer royal, has given (in his Introduction to "Taylor's Tables of Logarithms," p. 56.) the following method of finding any power of an impossible binomial, by another similar binomial. The logarithms of a and b being given, it is required to find the power of the impossible binomial $a \pm \sqrt{-b^2}$ whose index is $\frac{m}{n}$, that is to find $(a \pm \sqrt{-b^2})^{\frac{m}{n}}$ by another impossible binomial; and thence the value of $(a + \sqrt{-b^2})^{\frac{m}{n}} + (a - \sqrt{-b^2})^{\frac{m}{n}}$, which is always possible, whether a or b be the greater of the two.

Solution. Put $\frac{b}{a} = \text{tang. } z$. Then

$$(a \pm \sqrt{-b^2})^{\frac{m}{n}} (= a^2 + b^2)^{\frac{m}{2n}} \times (\text{cos. } \frac{m}{n} z \pm \sqrt{-}\text{sin. } \frac{2m}{n} z).$$

Hence $(a + \sqrt{-b^2})^{\frac{m}{n}} + (a - \sqrt{-b^2})^{\frac{m}{n}} = (a^2 + b)^{2\frac{m}{n}} \times 2$ cos. $\frac{m}{n} z = \overline{a \times \text{sec. } z}|^{\frac{m}{n}} \times 2$ cosin. $\frac{m}{n} z = (b \times \text{cosec. } z.)^{\frac{m}{n}} \times 2$ cosin. $\frac{m}{n} z$, where the first or second of these two last expressions is to be used, according as z is an extreme or mean arc; or rather, because $\frac{b}{a}$ is not only the tangent of z but also of $z + 360°$, $z + 720°$, &c.; therefore the factor in the answer will have several values, viz.

2 cos. $\frac{m}{n} z$; 2 cos. $\frac{m}{n} (z + 360°)$; 2 cos. $\frac{m}{n} (z + 720°)$; &c.; the number of which, if m and n be whole numbers, and the fraction $\frac{m}{n}$ be in its least terms, will be equal to the denominator n; otherwise infinite.

By Logarithms. Put log. b + 10 − log. a = log. tan. z. Then log. $\left(a + \sqrt{-b^2})^{\frac{m}{n}} + (a - \sqrt{-b^2})^{\frac{m}{n}}\right) = \frac{m}{n} \times$ (l. a + 10. − l. cos. z) + l. 2 + l. cos. $\frac{m}{n} z$ − 10 = $\frac{m}{n} \times$ (l. b + 10 − l. sin. z) + l. 2 + l. cos. $\frac{m}{n} z$ − 10; where the first or second expression is to be used, according as z is an extreme or mean arc. Moreover, by taking successively, l. cos. $\frac{m}{n} z$; l. cos. $\frac{m}{n} (z + 360°)$; l. cos. $\frac{m}{n} (z + 720°)$, &c. there will arise several distinct answers to the question, agreeably to the remark above.

BINOMIAL *surd*, is used for a binomial, the terms of which are surds; as $\sqrt{a} + \sqrt{b}$, or $a^{\frac{m}{n}} + b^{\frac{m}{n}}$, if m and n be fractions. The term binomial surd is also applied to any quantity having a rational part and a surd part, as $25 + \sqrt{968}$. Euclid enumerates six kinds of binomial lines or surds in the 10th book of his "Elements," which are exactly similar to the six residuals or apotomes, of which he has also treated in the same place. See APOTOME. These apotomes become binomials by merely changing the sign of the latter term from *minus* to *plus*, and they are as follow: 1st. $3 + \sqrt{5}$; 2d. $\sqrt{18} + 4$; 3d. $\sqrt{24} + \sqrt{18}$; 4th. $4 + \sqrt{3}$; 5th. $\sqrt{6} + 2$; 6th. $\sqrt{6} + \sqrt{2}$.

For the extraction of roots of binomial surds, see Newton's Arithmetica Universalis; St. Gravesande's Commentary; and Mac Laurin's Algebra, p. 114—130. See SURD.

BINOMIAL *Curve*, is used for a curve, the ordinate of which is expressed by a binomial. Thus, if the ordinate of a curve be of this form $\overline{x + e + fx}|^{\lambda}$, the curve is called a binomial curve. Stirling. Method. Diff. p. 58.

BINOMIAL *Theorem*, is a general algebraical expression, or formula, by which any power or root of a quantity, consisting of two terms, is expanded into a series.

It is also frequently called the Newtonian theorem, or Newton's binomial theorem, on account of his being commonly considered as the inventor of it, as he undoubtedly was, at least in the case of fractional indices, which includes all the other particular cases of powers, divisions, &c.

This celebrated theorem, as proposed in its most general form, may be exhibited in a manner nearly similar to that of Newton, as follows:

$$\overline{a + x}|^{\frac{m}{n}} = a^{\frac{m}{n}} \times : 1 + \frac{m}{n} \left(\frac{x}{a}\right) + \frac{m}{n} \cdot \frac{m - n}{2n} \left(\frac{x}{a}\right)^2 + \frac{m}{n} \cdot \frac{m - n}{2n} \cdot \frac{m - 2}{3n} \left(\frac{x}{a}\right)^3 + \text{\&c.}$$

Or, $\overline{a + x}|^{\frac{m}{n}} = a^{\frac{m}{n}} \times : 1 + \frac{m}{n} A \left(\frac{x}{a}\right) + \frac{m - n}{2n} B \left(\frac{x}{a}\right) + \frac{m - 2n}{3n} C \left(\frac{x}{a}\right) + \frac{m - 3n}{4n} D \left(\frac{x}{a}\right) + \text{\&c.}$

Where a, x, are the two terms of the binomial, $\frac{m}{n}$ the index, and A, B, C, D, &c. each preceding term, including their signs + or —, the terms of the series being all positive when x is positive, and alternately positive and negative when x is negative, independently however of the effect of the coefficients made up of m and n, which may be any numbers whatever, positive or negative.

A few easy examples, in the extraction of roots, will be sufficient to shew the application of the theorem in all similar cases. For this purpose, let it be required to find the square root of $a + b$, or $\overline{a + b}|^{\frac{1}{2}}$, and the cube root of $a - b$, or $\overline{a - b}|^{\frac{1}{3}}$; in the first of which $\frac{m}{n} = \frac{1}{2}$ and in the second $\frac{m}{n} = \frac{1}{3}$.

Then $\overline{a + b}|^{\frac{1}{2}} = a^{\frac{1}{2}} \left[1 + \frac{1}{2}\left(\frac{b}{a}\right) - \frac{1}{2.4}\left(\frac{b}{a}\right)^2 + \frac{3}{2.4.6}\left(\frac{b}{a}\right)^3 \frac{3.5}{2.4.6.8}\left(\frac{b}{a}\right)^4\right.$, &c.

And

And $\overline{a-b}|^{\frac{1}{3}} = a^{\frac{1}{3}}\left[1 - \frac{1}{3}\left(\frac{b}{a}\right) - \frac{1}{3^2}\left(\frac{b}{a}\right)^2 - \frac{5}{3\cdot 3^3}\left(\frac{b}{a}\right)^3 - \frac{5\cdot 8}{4\cdot 3^4}\left(\frac{b}{a}\right)^4\right.$, &c.

And, in the same manner, if 1, divided by the cube root of the square of $a \pm b$, be converted into a series, we shall have $\frac{1}{\overline{a \pm b}|^{\frac{2}{3}}} = \frac{1}{a^{\frac{2}{3}}}\left[1 \mp \frac{2}{3}\left(\frac{b}{a}\right) + \frac{2\cdot 5}{2\cdot 3^2}\left(\frac{b}{a}\right)^2 \mp \frac{2\cdot 5\cdot 7}{2\cdot 3^3}\left(\frac{b}{a}\right)^3\right.$, &c.

But these series are only commodious in calculation, in proportion to their degree of convergency. For if N be made to represent the rank which any term holds in the series arising from the binomial $a - b$ being raised to the mth power, then that term will be to the following one as 1 to $\frac{b}{a} \times \frac{m - N + 1}{N}$; from which it is evident, that for the terms of the series to go on decreasing, $b \times \overline{m - N + 1}$, taken positively, must be always less than aN

With respect to the history of this theorem, the prevailing opinion, till within these few years, has been, that it was not only invented by Newton, but first given by him in that state of perfection, in which the terms of the series, for any assigned power whatever, can be found, independently of the terms of the preceding powers; viz. the second term from the first, the third from the second, the fourth from the third, and so on, by a general rule. But it has since been found, that in the case of integral powers, the theorem had been described by Briggs, in his "Trigonometrica Britannica," long before Newton was born; and that, by the general law of the terms, independently of those of the preceding powers. For, as far as regards the generation of the coefficients of the terms of one power from those of the former ones, successively one after another, it was remarked by Vieta, Oughtred, and many others; and was not unknown to much more early writers on arithmetic and algebra, as will be manifest by a slight inspection of their works, as well as the gradual advance the property made, both in extent and perspicuity, under the hands of the latter authors, most of whom added something more towards its perfection.

The knowledge, indeed, of this property of the coefficients of the terms of the integral powers of a binomial, is, at least, as old as the practice of the extraction of roots, of which it is both the foundation and principle. And as the writers on arithmetic became acquainted with the nature of the coefficients in the higher powers, they extended the extraction of roots accordingly, still making use of this property. At first, they appear to have been only acquainted with the nature of the square, the coefficients of which are the three terms, 1, 2, 1; and, by their means, extracted the square roots of numbers, but went no farther. The nature of the cube next presented itself, which consists of the coefficients, 1, 3, 3, 1; and, by means of these, they extracted the cube roots of numbers, in the same way as is practised at present. And this was the extent of their extractions, in the time of Lucas de Burgo, who, from 1470 to 1500, wrote several tracts on arithmetic, containing the substance of what was then known of this science.

It was not long, however, before the nature of the coefficients of all the higher powers became known, and tables formed for constructing them indefinitely. For, in the year 1543, Michael Stifelius, a German, published an excellent work on arithmetic and algebra, under the title of *Arithmetica Integra*, in which he gives the following table, for constructing both figurate numbers and the coefficients of the terms of the various powers of a binomial, which, since his time, has been often used for these and other purposes; and more than a century after, was, by Pascal, otherwise called the arithmetical triangle, and of which he has commonly been called the inventor, though he only mentioned some of its additional properties.

1								
2								
3	3							
4	6							
5	10	10						
6	15	20						
7	21	35	35					
8	28	56	70					
9	36	84	126	126				
10	45	120	210	252				
11	55	165	330	462	462			
12	66	220	495	792	924			
13	78	286	715	1287	1716	1716		
14	91	364	1001	2002	3003	3432		
15	105	455	1365	3003	5005	6435	6435	
16	120	560	1820	4368	8008	11440	12870	
17	136	680	2380	6188	12376	19448	24310	24310

In this table Stifelius observes, that the horizontal lines furnish the coefficients of the terms of the correspondent powers of a binomial; and teaches how to use them in extracting the roots of all powers whatever. The same table was also used, for a similar purpose, by Cardan, Stevin, and other writers on arithmetic; and it is highly probable that it was known much earlier than the time of Stifelius, at least as far as regards the progressions of figurate numbers, which had been amply treated of by Nicomachus, who lived, according to some, before Euclid, but not till long after him, according to others; and whose work on arithmetic was published at Paris in 1538, and is supposed to have been chiefly copied in the treatise on the same subject by Boethius.

The contemplation of this table has also, probably, been attended with the invention and extension of some of our most curious discoveries in mathematics, both with respect to the powers of a binomial, the consequent extraction of roots, the doctrine of angular sections by Vieta, and the differential method of Briggs, and others. For a few of the powers or sections being once known, the table would be of the greatest use in discovering and constructing the rest; and accordingly it appears to have been used, on many occasions of this kind, by Stifelius, Cardan, Stevin, Vieta, Briggs, Oughtred, Mercator, Pascal, &c.

But although the nature and construction of this table were thus early known, and employed in raising powers and extracting roots, it was yet only by raising the numbers from one another, by continual additions, and taking them from the table for use when wanted; till Briggs first pointed out the way of raising any horizontal line in the table, by itself, without any of the preceding lines; and thus teaching to raise the terms of any integral powers of a binomial independently of any other powers; which was, in fact, giving the substance of the binomial theorem in words, but wanting the notation in symbols.

It may, however, be fairly questioned, whether Briggs knew how, even in the case of an integral exponent, to exhibit the law of the formation of the coefficients, under the form $\frac{m(m-1).(m-2)\ldots.(m-n+1)}{1.2.3\ldots.n}$; for, though his method of forming the successive coefficients amounts to nearly

nearly the ſame thing, yet the advancement in analyſis depended on the circumſtance of the law which they obſerve, being expreſſed by means of a general ſymbol (m); without which, its extenſion would never have been made to thoſe caſes in which the index is negative or fractional: ſo that Briggs, even in the caſe of integral powers, does not appear to be fully entitled to the invention of the binomial theorem, properly ſo called.

But however this may be, it is univerſally agreed that no one before Newton had ever thought of extracting roots by means of infinite ſeries. He was the firſt who happily diſcovered, that, by conſidering roots as powers having fractional exponents, the ſame binomial ſeries would equally ſerve for them all, whether the index ſhould be fractional or integral, or the ſeries finite or infinite; and from this extenſion of the theorem, ſome of the moſt important improvements, in the higher departments of mathematics, have ariſen; particularly in the conſtruction of logarithms, and the doctrine of ſeries in general, which have ſince been carried to a great degree of perfection, and now form ſome of the moſt curious and intereſting branches of analytics.

It may alſo be farther obſerved, with reſpect to the claim of Newton as an original inventor of this highly uſeful theorem, that he had probably never ſeen the *Arithmetica Logarithmica* of Briggs; for it is well known that he was not an extenſive reader of mathematical works, depending more on the powers of his own genius than upon any helps of this kind: ſo that there can be but little doubt of his having made the diſcovery himſelf, without receiving any light from what had been done by Briggs; and that he conceived the theorem to be new for all powers in general, as it was for roots and quantities with fractional indices.

But though this appears to be the caſe with reſpect to Newton, it is yet ſurpriſing that Dr. Wallis, who was a general reader of moſt mathematical works, and who had actually ſeen Briggs's *Arithmetica Logarithmica*, as he mentions it in page 60, chap. xii. of his Algebra, ſhould not have attended enough to this curious treatiſe, to know that it contained ſuch a new and excellent theorem, as it fully appears he did not; ſince, in the 85th chapter of the above-mentioned work, he aſcribes the invention entirely to Newton; and adds, that he himſelf had ſought after ſuch a rule, but without ſucceſs. It is alſo no leſs ſingular, that John Bernouilli, not half a century ſince, ſhould firſt diſpute the invention of this theorem with Newton, and afterwards give the diſcovery of it to Paſcal, who was not born till long after it had been taught by Briggs. (See Bernouilli's works, vol. iv. p. 173).

Dr. Wallis's Algebra was publiſhed in the year 1685; and it was here, for the firſt time after Newton's diſcovery of it, that the binomial theorem, according to his general manner of expreſſing it, appeared in print, and was made known to the learned world; though Leibnitz, and probably Dr. Barrow (who was Newton's great friend and patron in his youth), as well as ſome other mathematicians of that time, had ſeen it, in a letter addreſſed to Mr. Oldenburgh, of October 24th 1676, (which was given in the *Commercium Epiſtolicum*), ſoon after the ſaid letter was written. But he no where tells us his manner of inveſtigating it; nor is any demonſtration of it to be found, even in the caſe where the index is a whole number, in any part of his works. He ſays, indeed, in his next letter to Oldenburgh, to be found in the ſame work, that the occaſion of its diſcovery was as follows:

"Not long (he obſerves) after I had ventured upon the ſtudy of the mathematics, whilſt I was peruſing the works of the celebrated Dr. Wallis, and conſidering the ſeries of univerſal roots, by the interpolation of which we exhibit the area of the circle and hyperbola: for inſtance, in this ſeries of curves, whoſe common baſe or axis is x, and the reſpective ordinates $\overline{1-x^2}|^{\frac{1}{2}}$, $\overline{1-x^3}|^{\frac{1}{2}}$, $\overline{1-x^4}|^{\frac{1}{2}}$, $\overline{1-x^5}|^{\frac{1}{2}}$, $\overline{1-x^6}|^{\frac{1}{2}}$, $\overline{1-x^7}|^{\frac{1}{2}}$, &c. I obſerved that if the areas of the alternate curves, which are x, $x-\frac{1}{3}x^3$, $x-\frac{2}{3}x^3+\frac{1}{5}x^5$, $x-\frac{3}{3}x^3+\frac{3}{5}x^5-\frac{1}{7}x^7$, &c. could be interpolated, we ſhould, by this means, obtain the areas of the intermediate ones, the firſt of which $\overline{1-x^2}|^{\frac{1}{2}}$ is the area of the circle. In order to this it was evident, that in each of theſe ſeries the firſt term was x, and that the ſecond terms $\frac{0}{3}x^3$, $\frac{1}{3}x^3$, $\frac{2}{3}x^3$, $\frac{3}{3}x^3$, &c. were in arithmetical progreſſion; and conſequently the firſt three terms of the ſeries to be interpolated muſt be $x-\frac{1}{3}\left(\frac{1}{2}x^3\right)$, $x-\frac{1}{3}\left(\frac{3}{2}x^3\right)$, $x-\frac{1}{3}\left(\frac{5}{2}x^3\right)$, &c.

"Now, for the interpolation of the reſt, I conſidered that the denominators 1, 3, 5, 7, &c. were, in all of them, in arithmetical progreſſion; and conſequently the whole difficulty conſiſted in diſcovering the numeral coefficients: but theſe, in the alternate areas which are given, I obſerved were the ſame with the figures of which the ſeveral aſcending powers of the number 11 conſiſt, viz. 11^0, 11^1, 11^2, 11^3, 11^4, &c. that is, the firſt, 1; the ſecond, 1, 1; the third, 1, 2, 1; the fourth, 1, 3, 3, 1; the fifth, 1, 4, 6, 4, 1, &c.

"I applied myſelf, therefore, to diſcover a method by which the firſt two figures of this ſeries might be derived from the reſt; and I found, that if for the ſecond figure, or numeral term, I put m, the reſt of the terms would be produced by the continual multiplication of the terms of this ſeries, $\frac{m-0}{1}\times\frac{m-1}{2}\times\frac{m-2}{3}\times\frac{m-3}{4}\times\frac{m-4}{5}$, &c.

"For inſtance, if the ſecond term be put for 4, there will ariſe $4\times\frac{m-1}{2}$, that is 6, which is the third term; the fourth term will be $6\times\frac{m-2}{3}$, that is 4; the fifth term will be $4\times\frac{m-3}{4}$, that is 1; and the ſixth term will be $4\times\frac{m-4}{5}$, that is 0, which ſhews the ſeries is here terminated, in this caſe.

"This being found, I applied it, as a rule, to interpolate the above-mentioned ſeries. And ſince, in the ſeries which expreſſes the circle, the ſecond term was found to be $\frac{1}{3}\left(\frac{1}{2}x^3\right)$, I therefore put $m=\frac{1}{2}$, and there was produced the terms $\frac{1}{2}\times\frac{1}{2}\left(\frac{1}{2}-1\right)$ or $-\frac{1}{8}$; $-\frac{1}{8}\times\frac{1}{3}\left(\frac{1}{2}-2\right)$ or $+\frac{1}{16}$; $\frac{1}{16}\times\frac{1}{4}\left(\frac{1}{2}-3\right)$ or $-\frac{5}{128}$, and ſo on *ad infinitum*. Hence I found that the [illegible] of the [illegible] ſought is $x-\frac{1}{2}\left(\frac{1}{3}x^3\right)-\frac{1}{8}\left(\frac{1}{5}x^5\right)-\frac{1}{16}\left(\frac{1}{7}x^7\right)-\frac{5}{128}\left(\frac{1}{9}x^9\right)$ &c.

"In the ſame manner, the areas to be interpolated of the other curves might be produced; as alſo the area of the

hyperbola, and the rest of the alternate curves in the series $\overline{1+x^2}|^{\frac{0}{2}}$, $\overline{1+x^2}|^{\frac{1}{2}}$, $\overline{1+x^2}|^{\frac{2}{2}}$, $\overline{1+x^2}|^{\frac{3}{2}}$, &c.; and in a similar way might other series be likewise interpolated, and that even if they should be taken at two more intervals.

"This was the way by which I first opened an entrance into these speculations, which I should not have remembered, but that, in turning over my papers, a few weeks ago, I, by chance, cast my eyes upon those relating to this matter.

"After I had proceeded so far, it immediately occurred to me that the terms $\overline{1-x^2}|^0$, $\overline{1-x^2}|^{\frac{2}{2}}$, $\overline{1-x^2}|^{\frac{4}{2}}$, $\overline{1-x^2}|^{\frac{6}{2}}$, &c. that is, 1, $1-x^2$, $1-2x^2+x^4$, $1-3x^2+3x^4-x^6$, &c. might be interpolated in the same manner as I had done in the case of the areas generated by them: and for this, there required nothing more than to leave out the denominators, 1, 3, 5, 7, &c. in the terms that express the areas; then the coefficients of the terms to be interpolated ($\overline{1-x^2}|^{\frac{1}{2}}$, $\overline{1-x^2}|^{\frac{3}{2}}$, or universally $\overline{1-x^2}|^m$) will be had by the continual multiplication of the terms of the series $m \times \frac{m-1}{2} \times \frac{m-2}{3} \times \frac{m-3}{4}$ &c.

"Thus, for example, $\overline{1-x^2}|^{\frac{1}{2}} = 1 - \frac{1}{2}x^2 - \frac{1}{8}x^4 - \frac{1}{16}x^6$ &c.; and $\overline{1-x^2}|^{\frac{3}{2}} = 1 - \frac{3}{2}x^2 - \frac{3}{8}x^4 - \frac{3}{16}x^6$ &c.; and $\overline{1-x^2}|^{\frac{1}{3}} = 1 - \frac{1}{3}x^2 - \frac{1}{9}x^4 - \frac{5}{81}x^6$ &c.

"Thus, I discovered a general method of reducing radical quantities into infinite series, by the binomial theorem, which I sent in my last letter, before I observed that the same thing might be obtained by the extraction of roots.

"But after I had discovered this method, the other way could not long remain unknown; for, in order to prove the truth of these operations, I multiplied $1 - \frac{1}{2}x^2 - \frac{1}{8}x^4 - \frac{1}{16}x^6$ &c. by itself, and found the product to be $1-x^2$, all the terms after these *ad infinitum* vanishing: in like manner $1 - \frac{2}{3}x^2 - \frac{1}{9}x^4 - \frac{5}{81}x^6$ &c. being twice multiplied into itself, produced $1-x^2$. And as this was a certain proof of the truth of these conclusions, I was thereby naturally led to try the converse of it, viz. whether these series, that were now known to be the roots of the quantity $1-x^2$, might not be produced by the rule for extraction of roots in arithmetic; and, upon trial, I found it succeed to my wishes.

"This being found, I laid aside the method of interpolation, and assumed these operations, as a more genuine foundation to proceed upon. In the mean time, I was not ignorant of the way of reduction by division, which was so much easier."

From this account, as given by Newton himself, it appears that his discovery of the law for the areas, with irrational ordinates, preceded that of the law for the expansion of those ordinates; although the latter, as Montucla observes, might have been expected to precede the former, if inventive genius always pursued the most easy method. But, in tracing the progress of the human mind, it may generally be observed, that a collection of discoveries in any branch of science, is seldom found to be a series of regular deductions; but, on the contrary, we often discern therein many anticipations, and sometimes even a reversion of the natural and logical order of ideas.

It is worth while here to remark, that Newton had made these discoveries, as well as many others, several years before Mercator had published his "Logarithmotechnia," which contains a particular case of this theory; but, from an excess of modesty and indifference for these fruits of his genius, he delayed making them known to the world: and, even after the above-mentioned work had appeared, which would have operated as a powerful motive with most other men, in exciting them to share in the glory of these brilliant inventions, he was still more confirmed in the resolution he had taken, of not making himself known as an author till he was of a more mature age. He conceived, that Mercator having discovered, as it was said, the series for the hyperbola, would not be long before he extended his method to the circle, and other curves; or, if this should not be done by him, the invention would be readily perceived by others. In short, it appears rather singular, that as Mercator had converted the expression $\frac{1}{1+x}$ into an infinite series, by the ordinary method of division, he should not have tried to discover the series for $\sqrt{1 \pm x^2}$ by the known method of extracting the square root; but this, though extremely obvious, escaped his notice: and many circumstances, of a similar kind, are to be found in the history of the sciences.

Newton, as has been already observed, left no demonstration of this theorem; but appears to have formed it merely from an induction of particular cases; and though no doubt can be entertained of its truth, having been found to succeed in all the instances in which it has been applied; yet, agreeably to the rigour that ought to be observed in the establishment of every mathematical theory, and especially in a fundamental theorem of such general use and application, it is necessary that as regular and strict a proof should be given of it as the nature of the subject, and the state of analysis, can afford.

One of the first demonstrations of this kind that appears to have been given, is that of James Bernouilli, which is to be found, among several other curious things, in a small treatise of his, entitled "Ars Conjectandi," which has been very improperly omitted in the collection of his works, published by his nephew, Nicholas Bernouilli. But this is only applied to the case of integral and affirmative powers, and is nearly the same with that which was afterwards given by Mr. John Stewart, in his commentary on sir Isaac Newton's quadrature of curves. It is founded on the doctrine of combinations, and the properties of figurate numbers, which are there shewn to involve in them the generation of these coefficients; and in the instance before mentioned, where the index of the binomial is a whole positive number, it is clearly and satisfactorily explained.

Since that time, many attempts have been made to demonstrate the general case, or that where the index of the binomial is either a whole number or a fraction, positive or negative; but most of these demonstrations having been conducted, either by the method of increments, the multinomial theorem of De Moivre, or by fluxions, are commonly thought to be unsatisfactory and imperfect; and it should seem not without reason; as, independently of other objections, it appears contrary to the principles of science, as well as to just reasoning, to employ, in a matter purely algebraical, notions and doctrines derived from other branches, or from an analysis which is in some sort transcendental.

For these reasons, several eminent mathematicians have endeavoured to investigate this formula on pure analytical principles,

ciples, in a more natural and obvious way; one of the first of these attempts being that of Landen, in his "Discourse concerning the residual analysis," and the next that of Epinus, in the eighth volume of the "New Petersburg Memoirs." But the legitimacy of the former may be objected to, as depending upon vanishing fractions, and other considerations of too difficult and abstract a nature to be regarded as sufficiently convincing; and the latter, though very ingenious, is not less difficult and embarassing; at least, such is the opinion of Euler, who having himself first given a demonstration of this theorem, in which, like Maclaurin, he employed the differential calculus, or method of fluxions, was afterwards led to deduce it from the principles of algebra alone: though he does not appear to have been much more successful than either of the former.

S. Lhuilier of Geneva, perceiving the defects and obscurity of these methods, has made a new demonstration of this formula in one of the preliminary articles of his excellent work, entitled, "Principiorum calculi differentialis et integralis, &c." which is purely elementary; and abating from its length, and a fatiguing detail of particulars, which the nature of the subject does not seem to require, he appears to have accomplished his object; at least as far as the method he adopted would allow; for it must be confessed, that neither this, nor any other investigation that had hitherto appeared, have been attended with the simplicity and strictness which could be desired.

The reason of this, as Dr. Woodhouse properly observes, in his "Principles of Analytical Calculation," seems to be, that most mathematicians appear to have sought for some high origin of this theorem, distinct from the simple operations of multiplication, division, extracting of roots, &c.: and instead of considering the nature of the operations it was known to comprehend, hoped to supersede them by deductions drawn from abstruse and fine theories: whereas it is clear that whatever imperfections these fundamental operations are attended with, are also attached to the binomial theorem, which, in a certain sense, may be said to be a method of trial and conjecture. For, as this formula is only meant to express, in general terms, the algebraical rules above mentioned, it cannot possess a greater degree of certainty than is possessed by the simple operations themselves.

To avoid entering into a too prolix investigation of the well known and simple elements upon which the general formula depends, it is sufficient to observe that it is clearly manifest from some of the first and most common rules of algebra, that whatever is the operation which the index (m) in $\overline{a+x}|^m$ directs to be peformed upon the binomial $a+x$, whether of continued multiplication, or elevation, or of division, or of extraction of roots, the terms of the resulting series will necessarily arise by regular and whole positive powers of x; and that the two first terms of this series will always be $a^m + ma^{m-1}x$; so that the entire expansion of it may be represented under the form $a^m + ma^{m-1}x + px^3 + qx^3 + rx^4$, &c.

For, omitting the practical part of the process, which is taught by the above mentioned rules, it will constantly be found, by performing the operations at length in the usual way, that

$$\overline{a\pm x}|^2 = a^2 \pm 2ax + x^2$$
$$\overline{a\pm x}|^3 = a^3 \pm 3a^2x + 3a^2x^2 \pm x^3$$
$$\overline{a\pm x}|^4 = a^4 \pm 4a^3x + 6a^2x^2 \pm 4ax^3 + x^4$$
&c. &c.

$$\frac{1}{\overline{a+x}|} = a^{-1} \mp a^{-2}x + a^{-3}x^2 \mp a^{-4}x^3, \text{ \&c.}$$

$$\frac{1}{\overline{a+x}|^2} = a^{-2} \mp 2a^{-3}x + 3a^{-4}x^2 \mp 4a^{-5}x^3, \text{ \&c.}$$

$$\frac{1}{\overline{a\pm x}|^3} = a^{-3} \pm 3a^{-4}x + 6a^{-5}x^2 \pm 10a^{-6}x^3, \text{ \&c.}$$

&c. &c.

$$\overline{a\pm x}|^{\frac{1}{2}} = a^{\frac{1}{2}} \pm \frac{1}{2}a^{-\frac{1}{2}}x - \frac{1}{8}a^{-\frac{3}{2}}x^2 \pm \frac{1}{16}a^{-\frac{5}{2}}x^3, \text{ \&c.}$$

$$\overline{a\pm x}|^{\frac{1}{3}} = a^{\frac{1}{3}} \pm \frac{1}{3}a^{-\frac{2}{3}}x - \frac{1}{9}a^{-\frac{5}{3}}x^2 \pm \frac{5}{81}a^{-\frac{8}{3}}x^3, \text{ \&c.}$$

$$\overline{a\pm x}|^{\frac{2}{3}} = a^{\frac{2}{3}} \pm \frac{2}{3}a^{-\frac{1}{3}}x - \frac{1}{9}a^{-\frac{4}{3}}x^2 \pm \frac{2}{81}a^{-\frac{8}{3}}x^3, \text{ \&c.}$$

&c. &c.

$$\frac{1}{\overline{a\pm x}|^{\frac{1}{3}}} = a^{-\frac{1}{3}} \pm \frac{1}{3}a^{-\frac{4}{3}}x + \frac{2}{9}a^{-\frac{7}{3}}x^2 \pm \frac{7}{81}a^{-\frac{10}{3}}x^3 \text{ \&c.}$$

$$\frac{1}{\overline{a\pm x}|^{\frac{2}{3}}} = a^{-\frac{2}{3}} \pm \frac{2}{3}a^{-\frac{5}{3}}x + \frac{5}{9}a^{-\frac{8}{3}}x^2 \mp \frac{20}{81}a^{-\frac{11}{3}}x^3, \text{ \&c.}$$

&c. &c.

In all the instances here given, it is apparent, that the first term of the series, in each of them, is the same as the power or root of the first term of the binomial quantity to which it belongs; and that the coefficient of x in the second term is always had by multiplying the index of the first term into that term, having its index diminished by 1; and as these cases are of the same kind with those that are designed to be expressed, in universal terms, by the general formula; it is in vain, as far as regards the two first terms of the expansion, to look for any other origin of them, than what may be derived from these and similar operations.

Assuming therefore, $\overline{a+x}|^m = a^m + ma^{m-1}x + px^2 + qx^3 + rx^4$, &c. it only remains to determine the value of the coefficients p, q, r, &c. and to shew the law of their dependence on the index (m) of the operation by which they are produced.

For this purpose, let m denote any number whatever, integral or fractional, positive or negative; and let the coefficients of the 3d, 4th, 5th, &c. terms of the mth power of any binomial be denoted by p', q', r', &c.

Then for x, in the above form, put $y+z$, and there will arise $\overline{a+y+z}|^m = \overline{\overline{a+y}+z}|^m = \overline{a+\overline{y+z}}|^m$; which are all identical expressions; and when expanded according to the proper forms, must be equal to each other.

But $\overline{a+y+z}|^m = a^m + ma^{m-1}(y+z) + p(y^2+2yz, \text{ \&c.}) + q(y^3+3y^2z, \text{ \&c.})$ &c. (omitting to set down the higher powers of z, which are not wanted in the demonstration) $= a^m + ma^{m-1}y + py^2 + qy^3$ &c. $+ ma^{m-1}z + 2pyz + 3qy^2z$, &c.

And $\overline{\overline{a+y}+z}|^m = \overline{a+y}|^m + m.\overline{a+y}|^{m-1}z$, &c. $= \overline{a+y}|^m + mz\,(a^{m-1} + \overline{m-1}.a^{m-2}y + p'y^2 + q'y^3, \text{ \&c.}) = a^m + ma^{m-1}y + py^2 + qy^3$, &c. $+ ma^{m-1}z + m.\overline{m-1}.a^{m-2}yz + mp'y^2z + mq'y^3z$, &c. Hence the two series being identical, $a^m + ma^{m-1}y + py^2 + qy^3$ &c. $+ ma^{m-1}z + 2pyz + 3qy^2z$, &c. $= a^m + ma^{m-1}y + py^2 + qy^3$ &c. $+ ma^{m-1}z + m.\overline{m-1}.a^{m-2}yz + mp'y^2z + mq'y^3z$, &c. or, leaving out the terms common to each, $2pyz + 3qy^2z$ &c. $= m.\overline{m-1}.a^{m-2}yz + mp'y^2z$, &c.

And since the coefficients of the terms involving the same powers of the arbitrary quantities y and z must be the same, we shall have $2p = m.\overline{m-1}.a^{m-2}$, or $p = \frac{m.\overline{m-1}}{2}a^{m-2}$; and hence $p' = \frac{\overline{m-1}.\overline{m-2}}{2}a^{m-3}$. Also $3q = mp' = \frac{m.\overline{m-1}}{}$

$\frac{\overline{m.m-1}.\overline{m-2}}{2} a^{m-3}$, or $q = \frac{\overline{m.m-1}.\overline{m-2}}{2.3} a^{m-3}$; and so on.

From which it follows, that $\overline{a+x}|^m = a^m + m.a^{m-1}x + \frac{\overline{m.m-1}}{2} a^{m-2} x^2 + \frac{\overline{m.m-1}.\overline{m-2}}{2.3} a^{m-3} x^3$ &c. universally, whatever may be the value of m, whether integral or fractional, positive or negative, as was to be shewn.

The demonstration here given (which is similar to that in vol. ii. of Manning's Algebra) is founded upon the principles first laid down by la Grange, in his "Theorie des Fonctions Analytiques;" to which admirable work the reader is referred for further information on this subject, as well as for whatever regards the doctrine of expanded functions in general, which is there treated of in a way worthy the genius of the author.

BINOMIUS, from *bis* and *nomen*, *name*, in *Middle Age Writers*, denotes a person with two names.

Most Christians anciently were called binomii, as having had other names in their heathen state, which they changed at their conversion. Besides, it was an ancient custom for parents to give names to their children immediately after they were born, and sometimes other different ones afterwards at their baptism; one of which frequently became a *cognomen*, or surname. In reality, it was a constant practice to assume a new name at baptism, as the religious still do in the Romish church, on their reception into the monastic state; or the Jewish proselytes at their circumcision.

BINOTATA, in *Entomology*, a species of Chrysomela, found in Denmark. This is testaceous, with the wing-cases ferruginous at the base. Gmelin.

Binotata, a species of Cicada (*Membracis Foliacea*). This insect inhabits New Holland; the thorax is slightly armed, and produced behind; abdomen short and testaceous; with a black spot at the base of the wing-cases. Fabricius, &c.

BINOTATUS, an European species of Carabus, of a black colour, with two red spots in front of the head, and the antennæ yellow at the base. Fabricius.

Binotatus, a species of Cimex (*Reduvius*), found in Surinam. It is black above, with a rufous dot at the apex of each of the wing-cases. Fabricius.

BINTAM, in *Geography*, one of the chief towns of the kingdom of Yhor or Jor. See Malacca.

BINTAN, one of the small islands at the south end of the straits of Malacca, and nearly north from Lingan island.

BINTHA, in *Ancient Geography*, a town of Libya interior, near the Niger, according to Ptolemy.—Also, a place in Asia, in Osrhoené, according to the Notitia Imperii.

BINTSCHAY, in *Geography*, a town of Bohemia, in the circle of Boleslaw, 7 miles north-east of Turnau.

BINWY Head, a cape of Ireland, on the north-west coast of the county of Mayo. N. lat. 54° 20'. W. long. 9° 36'.

BIOBIO, or Viovio, a river of Chili, in South America. Its source is among the silver mines, in the mountains called *Sierra belluda*; it receives the streams of the Huequen and Tolpan, before it reaches Santa Fee, where it first becomes navigable, and from whence, to its mouth, for the distance of 33 leagues, its course is nearly from east to west.

The new city of Mocha, peopled by inhabitants who removed from Conception twelve years ago, is situated on its north bank, about twelve miles from the sea, and is a depot for the silver from the mines of Nimino, and for the gold with which its sands abound.

The mouth of this river is in S. lat. 36° 45'. W. long. 73° 28'; and its entrance known by two remarkable hills, called the Teats of Biobio, which are situated at the north, betwixt it and the bay of Conception, and serve to both as land-marks for navigators.

The river is about one mile across at the mouth, has good depth of water in the middle, and the tide rises about seven feet and a half at the full and change of the moon.

BIOCOLYTÆ, in the *Byzantine Empire*, an order of officers appointed to prevent the violences frequently committed by the soldiers. The word is compounded of βια, *vis*, *violence*, and κωλυω, *I hinder*; and should rather be written *biacolytæ*.

The biocolytæ appear to have been much the same with the French archers of the Marshalsea. They were suppressed by the emperor Justinian.

BIOCULATA, in *Entomology*, a species of Ephemera, described by Geoffroy, Linnæus, &c. The wings are white, reticulated; on the head two yellow tubercles. Fabr. Inhabits wet places in Europe. The tail of this kind is furnished with two bristles as long as the body.

Bioculata, in *Natural History*, a species of Hirudo, of an elongated form and cinereous colour, with two eyes. Gmel. Müll. This is *hirudo stagnalis* of Linnæus. Fn. Suec. &c. Found in wet hollows and rivulets very common. Length of this creature is nine lines. The female bears about forty eggs at a time, which are surrounded by a pellucid circle; at first these are cinereous, afterwards brown; and the young, after exclusion, adhere by their tails to the belly of the female. Gmel.

BIOCULATUS, in *Entomology*, a species of Cryptocephalus (*Crioceris*), found at the Cape of Good Hope. It is testaceous; thorax immaculate; on the wing-cases two ocellar white spots. Fabricius.

BIOCZ, in *Geography*, a town of Poland, in the palatinate of Cracow, north of the Carpathian mountains. N. lat. 49° 48'. E. long. 21° 40'.

BIOEA, in *Ancient Geography*, a sea-port in the southern part of the island of Sardinia, according to Ptolemy.

BIOGLIO, in *Geography*, a town of Italy, in the lordship of Vercelli, 23 miles N. W. of Vercelli.

BIOGRAPHER, formed from the Greek βιος, *life*, and γραφω, *I describe*, an author who writes a history, or life, of one or more persons. Such were Plutarch, Corn. Nepos, &c.

BIOGRAPHY, the art of describing or writing lives, is a branch or species of history more entertaining, as well as more useful in many respects, than general history, as it represents great men more distinctly, unincumbered with a crowd of other actors, and descending into the detail of their actions and character, their virtues and failings, gives more light into human nature, and leads to a more intimate acquaintance with particular persons than general history allows. A writer of lives may descend, with propriety, to minute circumstances and familiar incidents. From him it is expected to give the private as well as the public life of those whose actions he records; and it is from private life, from familiar, domestic, and seemingly trivial occurrences, that we often derive the most accurate knowledge of the real character. The subjects of biography are not only the lives of public or private persons, who have been eminent and beneficial to the world in their respective stations, but those also of persons notorious for their vice and profligacy; which may serve, when justly characterized, as warnings to others, by exhibiting the fatal consequences which, sooner or later, generally follow licentious practices. As for those, who exposed their lives, or otherwise employed their time and labours for the service

ſervice of their fellow-creatures, it ſeems but a juſt debt, that their memories ſhould be perpetuated after them, and that poſterity ſhould be made acquainted with their benefactors. This was no ſmall incentive to virtue in the pagan world; and no one can be ignorant, on due reflection, how natural this paſſion is to mankind in general. For this reaſon, as Dr. Ward preſumes (Orat. vol. ii. p. 252.), Virgil has placed not only his heroes, but alſo the inventors of uſeful arts and ſciences, and other perſons of diſtinguiſhed merit, in the Elyſian fields, where he deſcribes them (Æn. l. vi. v. 660.):

"Here patriots live, who, for their country's good,
In fighting fields were prodigal of blood;
Prieſts of unblemiſhed lives here make abode,
And poets worthy their inſpiring god;
And ſearching wits of more mechanic parts,
Who grac'd their age with new-invented arts;
Thoſe who to worth their bounty did extend,
And thoſe who knew that bounty to commend:
The heads of theſe with holy fillets bound,
And all their temples were with garlands crown'd."

In the lives of public perſons, their public characters are principally, but not ſolely, to be regarded. The world is inquiſitive to know the conduct of princes and other great men, as well in private as in public: and both may be of ſervice, conſidering the influence of their examples. But to be over-inquiſitive in ſearching into the weakneſſes and failings of the greateſt or beſt men, is, to ſay no more of it, a needleſs curioſity.

In this ſpecies of writing Plutarch has no inconſiderable merit; and to him we are indebted for much of the knowledge which we poſſeſs concerning ſeveral of the moſt eminent perſonages of antiquity. His matter, however, is better than his manner; as he cannot lay claim to any peculiar beauty or elegance. His judgment too, and his accuracy, have ſometimes been taxed; but whatever may be his defects of this kind, his lives of eminent men will always be conſidered as a valuable treaſure of inſtruction. He is remarkable for being one of the moſt humane writers of all antiquity; leſs dazzled than many of them are, with the exploits of valour and ambition; and fond of diſplaying his great men to us, in the more gentle lights of retirement and private life.

It has been a matter of diſpute among the learned, whether any one ought to write his own hiſtory. No one, it may be ſaid, can be ſo much maſter of the ſubject as the perſon himſelf; and beſides, there are many inſtances, both ancient and modern, to juſtify this practice. But, on the other hand, it muſt be owned, that it is attended with many inconveniences, ſome of which are mentioned by Cicero: "If," ſays he, (Ad. Famil. l. v. epiſt. 12.) "there is any thing commendable, perſons are obliged to ſpeak of themſelves with greater modeſty, and to omit what is blameable in others. Beſides, what is ſaid is not ſo ſoon credited, and has leſs authority; and after all, many will not heſitate in cenſuring it." To the ſame purpoſe it is well obſerved by Pliny (l. viii. ep. 1.): "Thoſe who proclaim their own virtues, are thought not ſo much to proclaim them, becauſe they did them, as to have done them, that they might proclaim them. Hence, what would appear great, if told by another, is loſt, when related by the party himſelf. For when men cannot deny the fact, they reflect upon the vanity of its author. Wherefore, if you do things not worth mentioning, the actions themſelves are blamed; and if the things you do are commendable, you are blamed for mentioning them." The juſtice of theſe reflections will be allowed; and yet, conſidering how natural it is for men to love themſelves, and to be inclined in their own favour, it ſeems to be a very difficult taſk for any one to write an impartial hiſtory of his own actions. There is ſcarcely any treatiſe of this kind that is more celebrated than Cæſar's "Commentaries;" and yet Suetonius tells us (In Vit. c. 56.), that "Aſinius Pollio, who lived at that time, thought that they were written neither with due care nor integrity; that Cæſar was too often credulous in his accounts of what was done by other perſons, and miſrepreſented his own actions, either deſignedly, or through forgetfulneſs; and therefore he ſuppoſes he would have reviſed and corrected them." At ſome times, however, it may without doubt be juſtifiable for a perſon to be his own hiſtorian. Plutarch mentions two caſes, in which it is allowable for a man to commend himſelf, and to be the publiſher of his own merits. Theſe are, "when the doing of it may be of conſiderable advantage, either to himſelf, or to others." "Anciently," ſays Tacitus (Vit. Agric. c. 1.), "many wrote their own lives, rather as a teſtimony of their conduct, than from pride;" remarking, "that the more virtue abounds, the ſooner the reports of it are credited." But the ancient writers had a method of diverting the reader's attention from themſelves, when they had occaſion to record their own actions, and of thus rendering what they ſaid leſs invidious, which was by ſpeaking of themſelves in the third perſon: thus Cæſar never ſays, "I did," or "I ſaid this or that," but always "Cæſar did," or "ſaid, ſo and ſo." Dr. Johnſon has given an excellent paper on the ſubject of biography in the collection of papers called the "Idler." Volney, in his "Lectures on Hiſtory," remarks, that biography is the only kind of hiſtory that is proper for young people. See HISTORY.

Dr. Prieſtley has conſtructed and publiſhed a "Biographical Chart," which is very uſeful to ſtudents in chronology, hiſtory, and biography. This chart, which is about three feet in length, and two feet in breadth, repreſents the interval of time between the year 1200 before the Chriſtian æra and 1800 after Chriſt, divided by an equal ſcale into centuries. It contains about 2000 names of perſons the moſt diſtinguiſhed in the annals of fame, the length of whoſe lives is here repreſented by lines drawn in proportion to their real duration, and terminated in ſuch a manner as to correſpond to the dates of their births and deaths in univerſal time. Theſe names are diſtinguiſhed into ſeveral claſſes by lines running the whole length of the chart, the contents of each diviſion being expreſſed at the end of it. The chronology is noted in the margin on the upper ſide, by the year before and after Chriſt, and on the lower by the ſame æra, and alſo by the ſucceſſion of ſuch kings as were the moſt diſtinguiſhed in the whole period.

BIOLLE, LA, in *Geography*, the chief place of a canton, in the diſtrict of Chambery, and department of Mont Blanc. The population of the place is eſtimated at 1038, and of the canton at 5625 perſons; the territorial extent contains 92½ kiliometres, and 10 communes.

BIOLYCHNIUM, formed of βιος, *life*, and λυχνος, *light*, a name given by ſome phyſicians to a ſuppoſed principle of vitality inherent in the heart, or blood, and remaining there as long as life continues. Of this principle, or innate heat, different accounts have been given by different writers; as Gaſp. Hoffman, Conrigius, &c.

Beguinus has deſcribed a proceſs for preparing from human blood a vital balſam under this denomination; and J. Ern. Burgravius has written a treatiſe upon it.

BION, in *Biography*, a native of Proconneſus, was contemporary with Pherecydes, and flouriſhed about the 59th olympiad, or 544 years B. C. Clemens Alexandrinus informs us, that he copied the titles, and abridged the works of

of Cadmus the Milesian, who is said to have been the first writer of history in prose, and to have lived before the Trojan war.

Bion, the *Philosopher*, was a native of Borysthenes, and flourished in the reign of Antigonus Gonatas, king of Macedon, and died about the last year of the 134th olympiad, or the 241st year B.C. He was a person of mean extraction, being the son of a Lacedæmonian harlot; and when young, was sold as a slave to an orator, who afterwards gave him his freedom, and left him large possessions. Thus endowed, he went to Athens, and devoted himself to the study of philosophy. He was first the disciple of Crates, then of the Cynics, afterwards of Theodorus, and last of all of Theophrastus; but he adopted and maintained the opinions of Theodorus, called the atheist. He was skilled in geometry and music, and also in poetry and rhetoric; and went about from one city to another, displaying his talents. Several of his repartees, for which he was famous, are preserved; and Horace is supposed to allude to him in his

"Ille Bioneis sermonibus, et sale nigro." Epist. 2. lib. ii. To a great talker, who asked him a favour, he said, "If you would have me grant it, let some other person ask it for you." Being on board a ship belonging to pirates, which was chased by another, the pirates exclaimed, "We are undone, if they discover who we are;" "and I," says Bion, "if they discover who I am." He ridiculed the contradiction of burning the dead as if they were insensible, and lamenting them as if they were still sensible. Some of his jests were offensive to morals and decency; for to neither of these did he pay much regard. Notwithstanding his avowed irreligion, he recurred, when sick, to the practice of puerile superstitions, and submitted to death with great reluctance. Brucker's Hist. Phil. by Enfield, vol. i. p. 189. Gen. Dict. Laertius, lib. iv. tom. i. Ed. Meib. p. 253, &c.

Bion, a celebrated Bucolic poet, was a native of Smyrna, and a contemporary of Ptolemy Philadelphus, about 280 years B.C. In Sicily or Magna Græcia, where he is supposed to have spent the last part of his life, Moschus was his pupil; and from the beautiful elegy of this poet, we are led to infer, that he lost his life in prison, and that the perpetrators of this deed did not escape just punishment. As a poet he was highly esteemed; and his performances that are extant, though inconsiderable, serve as examples of the excellence to which the Greeks had attained in similar compositions. Nothing can be more sweet and tender than his "Elegy on the death of Adonis," nor any thing more elegantly ingenious than his "Cupid instructed." The works of Bion are usually printed with those of Moschus; and the best editions are those of Paris, in 1686; of Venice, in 1746; Heskin's, at Oxford, in 1748; Scheir's, at Leipsic, in 1752; and Wakefield's, Lond. 1795. Gen. Dict. Gen. Biog.

Bion, M. mathematical instrument maker to the French king, died at Paris, in 1733, at the age of 78 years, and is known to mathematicians as the author of two works; one, "On the construction and principal uses of mathematical instruments," translated into English with additions, by Mr. Edmund Stone; and another, "On the Use of the Globes;" the fifth edition of which was published at Paris, in 1728.

BIONCOURT, in *Geography*, a town of France, in the department of the Meurthe, and the chief place of a canton, in the district of Chateau-Salins, 2 leagues W.S.W. of Chateau-Salins.

BJÖRKNA, in *Ichthyology*, a species of Cyprinus, having thirty-five rays in the anal fin. Found in the lakes of Sweden. Linnæus. This is *Cyprinus quincuncialis*, pinna ani officulorum 25, of Ardeti.

BIONDO, Flavio, (Lat. *Blondus*), in *Biography*, an antiquary and historian, and one of the first who illustrated the Roman antiquities, was born at Forli in 1388, and studied at Cremona. Being deputed in his youth on public business to Milan, he there made the first copy of Cicero's treatise on famous orators. At Rome he became secretary to pope Eugenius IV., and served the three succeeding popes in the same office. He was employed in various delegations to Venice, where he had an opportunity of cultivating an acquaintance and friendship with many learned persons in that republic. Debarred by his marriage from enjoying any church preferments, and devoted to study more than to the pursuit of wealth and honour, he preferred retirement to any public station, and prosecuted his literary labours till his death in 1463. His long residence at Rome enabled him accurately to describe its chief relics of antiquity in 3 books entitled "Roma instaurata;" which were followed by 10 books on the laws, government, customs, religion, &c. of the Romans, under the title of "De Roma Triumphante." Another work, on its history, antiquities, and geography, was intitled "Italia Illustrata." All these works display great reading and diligent research, though they are not free from many errors to which his ignorance of Greek literature must have contributed. Having undertaken to write a general history from the decline of the Roman empire to his own time, he finished three decads of it, and the first book of the fourth. He also wrote a book "De Origine et Gestis Venetorum," and had planned an entire history of the Venetian republic; but he afterwards chose to insert the substance of it in his general history. He left several other writings in MS., which it is needless to mention. His style wants purity and elegance, and his judgment in collecting materials was superior to his taste in using them. A collection of his works was published at Basil, in 1531, fol. Nouv. Dict. Hist. Gen. Biog.

BIORKO, in *Geography*, a town of Sweden, in the province of Upland.

BIORNEBORG, a town of Finland, on the east side of the gulf of Bothnia, seated on a lake, 80 miles north of Abo. N. lat. 62° 6′. E. long. 22° 35′.

BIORNSE, a small island of Denmark, near the south coast of the island of Funen.

BIÖRNSTAHL, James Jonas, in *Biography*, a learned Swedish traveller, was born at Rotarbo in 1731, and having finished his education in the university of Upsal, he became, in 1766, tutor to the son of baron Rudbec, with whom he travelled for eight years through France, Italy, part of Germany, Holland, and England. At Paris, where he improved himself in the Oriental languages, he was elected, in 1770, a member of the academy of sciences, and upon the baron's return to Sweden, in 1775, Biörnstahl received orders from the king to travel at his expence through the Ottoman empire, Syria, Egypt, and the northern part of Africa, and in the same year he was appointed extraordinary professor of philosophy at Upsal. In the following year he commenced his travels; and having arrived at Constantinople, he continued there two years, improving himself in the eastern languages. In 1779, he was appointed professor of the Oriental languages at Lund; but he died this year of a putrid fever at Salonichi. The result of his observations in the course of his travels was communicated in a series of letters to C. C. Giörwell, librarian to the king at Stockholm; and a complete collection of them appeared at Stockholm, in 1778, in three volumes, 8vo. under the title of "J. J. Biörnstahl's Bref rörande des utländska Resa tii utgifvaren C. C. Giörwell." A German translation of this work was published at Stralsund and Rostock, in 1783, in six volumes, 8vo. The principal object of Biörnstahl's research was Oriental MSS. from which he made many important and useful extracts. Gen. Biog.

BIOT, in *Geography*, a town of France, in the department of the Var, and chief place of a canton, in the district of Grasse, 3 miles north of Antibes.

BIOTA, in *Zoology*, a name introduced by Dr. Hill for the POLYPE genus called *Hydra*, by Linnæus, as it is believed from the reproduction or repullulation of the parts when cut off; and this name *biota* is likewise given it on the same account, being derived from βιος, *life*. See HYDRA.

BIOTHANATI, from βια, *violence*, and θανατος, *death*, in some *Medical Writers*, denote those who die a violent death. The word is also written, and with more propriety, *liathanati*; sometimes *lieathanati*.

In a more particular sense, it denotes those who kill themselves, more properly called *autothanati*. See SUICIDE. In this sense it is that the word is used both by Greek and Latin writers. By the ancient discipline of the church, they were punished by denying them burial, and refusing all commemoration of them in the prayers and offices of the church.

BIOTHANATI, supposed by some to be derived from βιος, *life*, and θανατος, *death*, and alluding to the belief of a future life after death, was also a name of reproach given by the heathens to the primitive Christians, for their constancy and forwardness to lay down their lives in martyrdom.

BIOTHANATOS is also used in some writers of the barbarous age for wicked, damnable, or accursed. Du-Cange.

BIOUAC, BIVOUAC, or BIOVAC, in the *Military Art*, a nightly guard performed by the whole army, when there is an apprehension of danger from the enemy. The word is formed by corruption from the German *weywacht*, a *double watch* or *guard*. See GUARD.

BIOULLE, in *Geography*, a town of France, in the department of the Lot, and chief place of a canton, in the district of Montauban, 3 leagues N.E. of Montauban.

BIPARTIENT, in *Arithmetic*, is a number that divides another into two equal parts without a remainder. Thus 2 is a bipartient to 4, &c.

BIPARTITA, in *Entomology*, a species of LEPTURA, that inhabits Upper Austria. It is of a black colour; thorax ferruginous, with a longitudinal black line; a common ferruginous spot on the wing-cases.

BIPARTITE LEAF, in *Botany*. See LEAF.

BIPARTITION, signifies a division into two equal parts.

BIPED, in *Zoology*, an animal furnished with only two legs. Men and birds are bipeds. Apes occasionally walk on their hind legs, and seem to be of this tribe, but that is not a natural position for them, and they rest upon all their legs like other quadrupeds. The jerboas are also of the latter description, jumping and leaping on their hind legs, but resting on the fore legs likewise.

Plato, we are told, once described a man to be a biped without feathers; and Diogenes, in order to shew what he deemed the absurdity of this definition, plucked all the feathers off a cock, and placing it in the midst of the Academic school, exclaimed, "there is one of Plato's men!"

BIPED, BIPEDE, BIPES, a genus of reptiles that belongs to the lizard family, in the system of La Cepede. These have, according to the character established by that author, a very long body covered with scales; and the toes of the two little feet, which are placed anteriorly, are armed with nails. La Cepede describes only one species of this genus, which he calls *le cannelle*; it is a native of Mexico, and preserved in the museum at Paris. La Cepede, it appears, was the first writer who described this creature; but Dr. Shaw noticed it afterwards in the Naturalist's Miscellany, under the name of *lacerta lumbricoides*, lumbriciform lizard, which see; and a specimen of it, about half the size of that in the museum at Paris, is preserved in the British museum. This must not be confounded with *lacerta bipes* of Linnæus. Pallas has described another kind of biped lizard, which is called *lacerta apus*, but in that the legs are very small, monodactylous, and placed far behind: some have almost doubted whether these may not rather be part of the organs of generation than legs; and in general appearance the creature approaches rather to the snake than lizard tribe. It is a native of the southern parts of Siberia, and also of Greece, and is of a ferruginous colour.

BIPENNIS, in *Roman Antiquity*, a two-edged ax, used anciently by the Amazons in fight: as also by the seamen, to cut asunder the ropes and cordage of the enemy's vessels. The bipennis was a weapon chiefly of the oriental nations, made like a double ax, or two axes joined back to back, with a short handle. Some compare it to a figure of a pen, and suppose it hence to have acquired the name *bipennis*; the tube or barrel of the pen representing the handle, and the point or nib the head. Modern writers usually compare it to our halbard, or partizan; from which it differed in that it had no point, and that its shaft or handle was much shorter. See HALBARD.

BIPES, in *Zoology*, a species of LACERTA, with the body subequal, round, imbricated, and pale; on each scale a brown dot; no anterior feet; posterior feet with two toes unarmed. Gmelin. *Anguis bipes*, with 100 abdominal, and 60 subcaudal plates. Linn. Mus. Ad. Frid. A native of South America and India. Length about six inches; body cylindrical and slender; colour pale yellow. Biped Lizard.

BIPES, a species of COLUBER, described by Gmelin on the authority of Scopoli, as an inhabitant of the Tyrolese waters, where it is said to feed on frogs and fishes; it has two feet, fulvous eyes, whitish under-jaw, elliptic, marginate, dorsal scales; sides spotted with white; abdominal plates whitish, with a brown spot in the middle. Gmelin describes it specifically as having 116 plates on the belly, and 58 subcaudal scales.

BIPINNULA, in *Botany*. See ARETHUSA.

BIPLICATA, in *Conchology*, a species of VOLUTA, figured by Martini only. It is of a tapering shape, smooth, white spotted with yellow, and dotted with black; lip acute; pillar with two plaits.

BIPUNCTARIA, in *Entomology*, a species of PHALÆNA (*Geometra*), the anterior wings of which are cinereous, undulated with brown; a dusky band in the middle, and two black dots. Fabricius, &c.

BIPUNCTATA, a species of APIS, that inhabits Siberia. This insect is hairy and black, with two yellow belts; the first with two lateral black dots. Lepechin. it. Gmel.

BIPUNCTATA, a species of ARANEA, with a black, globose abdomen, marked with two excavated dots. Linn. Fn. Suec.

BIPUNCTATA, a species of CANTHARIS, with two black spots on the thorax; wing-cases black at the tip. Fabricius. Inhabits Leipsic.

BIPUNCTATA, a species of CASSIDA, of a yellowish colour, with two black dots on the wing-cases. This is a native of India. Fabricius.

BIPUNCTATA, a species of CHRYSOMELA, described by Fabricius as a native of the Cape of Good Hope. It is testaceous, with a brown spot on each of the wing-cases.

BIPUNCTATA, a species of CICADA, described by Linnæus. It is yellow, with two brown spots in front; wing-cases white, veined with yellow. A native of Europe.

Bipunctata is also a species of Cicada (*Deflexa*), found in South America. The colour is whitish; wing-cases deflected, and griseous, with two impressed dots on the anterior part of the margin of the thorax. Fabricius, &c.

Bipunctata, a species of Coccinella, of a red colour, with two black dots. Linn. Fn. Suec. &c.

Bipunctata, a species of Forficula, that inhabits Italy. This is black; hind part of the head and legs rufous; a white spot on the wing-cases. Fabricius. It has eleven joints in the antennæ.

Bipunctata, a species of Leptura, of a black colour, and villous; wing-cases livid; suture, spot in the middle, and tip black. Inhabits Siberia.

Bipunctata, a species of Nitidula, of a testaceous colour, with five black spots. Gmelin.

Bipunctata, a species of Tenthredo, with somewhat setaceous antennæ, of nine joints; black; scutel black, and marked with two white dots. Inhabits the woods of Lusace.

Bipunctata, a species of Vespa, with a spotted thorax; abdomen with four yellow bands, and two dots of the same colour on the first segment. Fabricius. Inhabits Germany.

BIPUNCTATUM, a species of Opatrum, of a brown colour, with somewhat cylindrical, immarginate thorax, with two hollows; two extreme joints of the antennæ distant and larger. Herbst. Gmel. &c.

BIPUNCTATUS, a species of Bruchus, that inhabits Helvetia. It is cinereous; wing-cases brown with an ocellar, black dot at the base of each. Fabricius.

Bipunctatus, a species of Carabus, of a somewhat brassy colour, with two impressed dots on the wing-cases. Linn. Fn. Suec. This is described by Fabricius as being brassy, with black antennæ, and pale shanks. This inhabits Europe.

Bipunctatus, a species of Cimex (*Rotundatus*,) of a pale griseous colour, with a white dot on each side of the scutel near the base. Linnæus. Inhabits Syria.

Bipunctatus, a species of Cryptocephalus, of a glossy black; wing-cases red with two black dots: antennæ length of the body. Fabricius. Gmelin, &c. *Chrysomela punctata*. Linn. Inhabits the northern parts of Europe; on the Nut.

Bipunctatus, a species of Curculio, found in Europe. This is cinereous, with a black spot on the wing-cases; shanks yellowish. Linnæus. Fn. Suec.

Bipunctatus is likewise a species of Curculio, with the thorax scabrous; wing-cases clouded, with two glossy black spots near the apex. Lepech. it. A native of Siberia.

Bipunctatus, a species of Gryllus (*Acrida. Truxalis*), of a brownish colour; scutel as long as the abdomen. A native of Europe.

Bipunctatus, a species of Hemorobius, found in Europe. It is variegated with yellow and brown, and has two black spots on the wings. Fabricius.

Bipunctatus, a species of Ichneumon, found in Europe. This insect is black; base of the antennæ brown; thighs at the base, and face yellow, with two black marks on the latter; abdomen, shanks, and tips of the posterior feet ferruginous. Linn. Mus. Lesk.

Bipunctatus, a species of Papilio (*Pleb. Urb.*) The wings are entire, brown; on both sides of the first pair an oblique band, and two dots of silvery; at the base of the posterior ones beneath a band and striæ of yellowish.

Bipunctatus, a species of Scarabæus, having a black thorax, bordered with red; and red wing-cases with a black spot on each. Lepech. it. Fabricius. This is the insect which Pallas names *Scarabæus coccinelloides*; it is found in the southern parts of Russia under horse dung.

Bipunctatus, in *Ichthyology*, a species of Cyprinus, described by Bloch. The lateral line is red, with a double series of black spots; and sixteen rays in the anal fin. This kind is found in the sandy rivers of Germany.

BIPUNCTELLA, in *Entomology*, a species of Phalæna (*Tinea*), wings cinereous brown, with a margal white spot. Fabricius.

Bipunctella, a species of Phalæna (*Tinea*), with fuscous wings, with a common dentated white stripe; thorax snowy-white with two black spots. Fabricius. This is *Tinea cochiella* of Schmetterl.

BIPUSTULATA, a species of Cantharis (*Malachius*), of a brassy green colour with the apex of the wing-cases red. Linn. Fn. Suec. Geoffroy. This is *Thelephorus viridiæneus nitidus* of Degeer. A very common insect in most parts of Europe.

Bipustulata, a species of Cassida, of a green colour; wing-cases with two lateral sanguineous spots. Inhabits Cayenne. Linn. Fabr. &c.

Bipustulata, a species of Chrysomela, described as a Swedish insect by Thunberg. The wing-cases are black, spot at the tip, head and sides of the thorax yellow.

Bipustulata, a species of Coccinella, of a black colour, with red spots, and sanguineous abdomen. Linn. Fn. Suec.

Bipustulata, a species of Hispa, with serrated antennæ; black and hairy, with a rufous spot at the base of the wing-cases. This kind inhabits Italy. Fabricius.

Bipustulata, a species of Leptura, that inhabits Upsal. The wing-cases are black, striated with dots, and two testaceous spots. Thunberg, &c.

Bipustulata, a species of Nitidula, of an ovate form, and black colour, with a red spot on each of the wing-cases. Fabricius and Gmelin. This is *Silpha oblonga nigra*, &c. of Linn. Fn. Suec. and Syst. Nat. *Silpha*, of Degeer; *Dermestes*, of Geoffroy; and *Ostoma bipustulata*, of Laichart. Inhabits Europe, and feeds on carcases, meat, bacon, &c.

BIPUSTULATUM, a species of Opatrum, that inhabits Pomerania, and is about the sixth part of an inch in length. Its form is narrow and elongated; colour ferruginous; wing-cases slightly grooved.

BIPUSTULATUS, a species of Attelabus, met with in North America. It is black, with a rufous spot at the base of each of the wing-cases. Fabricius.

Bipustulatus, an insect of the genus Carabus, in Gmelin's edition of the *Systema naturæ*. This is the true *Carabus crux major* of Linnæus, which Fabricius misconceiving, describes as a new species, in his work entitled "Species Insectorum," under the name of *Bipustulatus*. By retaining at the same time the Linnæan character of *Carabus crux major* under the proper name, he constitutes two species of the same insect. In the *Entomologia systematica* of Fabricius, this error is continued, and Gmelin, resting on the authority of this writer, describes them also as distinct species. See Crux major (*Carabus*.)

Bipustulatus, a species of Cimex, the general colour of which is black; thorax spinous; wing-cases livid; and two scarlet dots on the head. Fabricius, Gmelin, &c. *Cimex balteatus* of Degeer. Inhabits South America.

Bipustulatus, a species of Cryptocephalus, described by Fabricius as being of a black colour, with a rufous spot at the tip of the wing-cases. Obs. The figure referred to in Schæffer *Vierzehender Fallkäfer*, is not black, but of a light

light or azure blue, rufous at the apex of the wing-cafes; and the antennæ of the fame colour. It is an European infect, and inhabits the flowers of the chryfanthemum. Gmelin confiders it as *Crytocephalus pedis* of Laichart.

Bipustulatus, a fpecies of Dermestes, that is black and gloffy, with the head, thorax, and fpot at the bafe of the wing-cafes red. Thunberg. This is *Ips humeralis* of Fabricius. Country unknown.

Bipustulatus, a fpecies of Dytiscus, defcribed by Fabricius. It is fmooth and black, with two red fpots on the poftterior part of the head. This inhabits the north of Europe.

Bipustulatus, a fpecies of Dytiscus, that inhabits Germany. This kind is black; thorax yellow, with two black fpots; wing-cafes yellow, varied with brown. Fabricius.

Bipustulatus, a fmall fpecies of Elater, found in woods in England and other parts of Europe; the colour is black and fhining, with a red fpot at the bafe of each of the wing-cafes. Linn. Marfh, &c. Obf. By miftake this infect is thus defcribed by Gmelin, *Niger nitidus, elytris punctis duobus nigris*, with reference to the Fabrician Species Infectorum, in which the dot at the bafe of the wing-cafes is faid to be red. This is *Elater punctatus* of Panzer; and *Le Taupin noir à taches rouges* of Geoffroy.

Bipustulatus, a fpecies of Gryllus, in the fection *locufta*, of a pale brown colour; fword at the extremity of the abdomen, and two fpots on the thorax black; wing-cafes yellowifh, teffellated with black, and fhorter than the wings. Gmelin, &c. This infect is rather lefs than an inch in length according to Schæffer's figure, exclufive of the antennæ, which are rather longer than the body. Inhabits Europe.

[illegible] colour, with a rufous fpot on each of the wing-cafes. A native of New Holland. Fabricius.

[illegible], that inhabits the northern parts of Europe. Colour black, with a ferruginous dot on each of the wing-cafes. Linn.

[illegible]UADRATE, or Biquadratic *power*, in *Algebra* and *Arithmetic*, is the next power above the cube, or the fquare multiplied by itfelf. Thus, 16 is the biquadrate, or [illegible] the [illegible] power of 2: for $2 \times 2 = 4$, and $4 \times 4 = 16$.

BIQUADRATIC *Equation*, an equation raifed to the fourth power, or where the unknown quantity of one of the terms has four dimenfions: thus, $x^4 + ax^3 + bx^2 + cx + d = 0$ is a biquadratic equation. See Equation.

[illegible] third order, having two infinite legs tending the fame way. See Parabola.

Biquadratic *root of any number*, is the fquare root of the fquare root of that number: thus, the biquadratic root of 81 is 3: for the fquare root of 81 is 9, and the fquare root of 9 is 3: the biquadratic root of 16 is 2.

BIQUALAR, in the *Cuftoms of the Algerines*, a cook of the divan. The Janizaries, whom the Algerines call *oldechis*, after ferving a certain time as common foldiers, are preferred to be biqualars, or cooks of the divan, which is the firft ftep towards arriving at higher preferments. Biqualars have the care of furnifhing the officers and commanders of the Algerine foldiery with meat and drink in the camp, in garrifon, &c. From biqualars they are made *odobechis*; that is, corporals of companies, or commanders of fquadrons.

BIQUINTILE, an afpect of the planets, when they are 144 degrees diftant from each other. It is thus called, becaufe they are diftant from one another by twice the fifth part of the 360 degrees. See Aspect.

BIR, or Biraidschik, in *Geography*, a town of Afiatic Turkey in Mefopotamia, feated on a mountain near the eaft coaft of the Euphrates, in a very fertile country, the refidence of a bey; 100 miles S. W. of Diarbeck.

BIRABETANE, in the *Botanical Writings of the Ancients*, a name given to *verbena*, or vervain, and to other herbs ufed in facrifices. It is only the word *hierobotane*, as altered by the Æolic manner of writing and fpeaking it. Hierobotane is the common Greek name of vervain, and other facrifical herbs, and it is probable that the Latin name verbena came from the Æolic manner of fpeaking this word. All thofe herbs, which were laid upon the altars on folemn occafions, fuch as making of peace, and other folemn contracts, and were to be taken up by the contracting parties as part of the ceremony, were called by the Greeks *hierobotane*, that is, facred plants, and verbenæ; but as the plant we now particularly know by the name verbena was more frequent in ufe than any other on this occafion, it was afterwards diftinguifhed by that name. See Verbena.

BIR-AL-CADHI, in *Geography*, a town of Perfia, in the province of Segeftan, 80 miles weft of Zareng.

BIRBOOM, a town of Hindoftan in Bengal, 56 miles W. S. W. of Moorfhedabad, 100 N. N. W. of Calcutta. N. lat. 24°. E. long. 87° 40'.

BIRBUSCA. See Birviesca.

BIRCH, Thomas, in *Biography*, an Englifh hiftorical and biographical writer of extenfive and induftrious refearch, was born in London, November 23, 1705. His parents were Quakers; and he was intended for his father's trade, which was that of a coffee-mill maker; but fo ftrong was his inclination to literature, that he requefted leave to indulge it on the condition of providing for himfelf. Accord- [illegible] to the Quakers at Hemel Hempfted; and after a fimilar employment in other fituations, he at length deferted the [illegible] advantage of an univerfity education, took orders in the church of England. In 1732, having been ordained deacon in 1730, and prieft in 1731, he was preferred under the patronage of lord chancellor Hardwicke, who was then attorney general, to the living of Ulting, in the county of Effex. [illegible] of a clergyman; but fhe died within 12 months after their marriage. In 1735, he was admitted into the royal fociety, and alfo into the fociety of antiquaries; and of the former fociety he became fecretary in 1752, which office his declining health obliged him to refign in 1765. In 1753, the [illegible] Marifchal college of Aberdeen, and in the fame year he received the fame honour from Dr. Herring, archbifhop of Canterbury. He was alfo a director of the fociety of antiquaries, and a trufte of the Britifh mufeum. His [illegible] preferments were various, and rapid in their [illegible] the laft of thefe was the rectory of Depd[illegible] he held, together with the united rectories of St. Pattens and St. Gabriel, Fenchurch-[illegible] This melancholy event happened in coming his horfe betwixt London and Hamp[illegible] 1766. Having, in the courfe of [illegible] his relations, he bequeathed his library [illegible] to the Britifh mufeum, and the [illegible] amounting to little more than 500l. [illegible] augmenting the falaries of the affi[illegible]

Dr. Birch was diftinguifhed by [illegible] ners, and the friendlinefs and [illegible] He was eminently active and [illegible] and laudable undertakings of va[illegible] devoted much of his time and [illegible] ture, he gained leifure by early [illegible]

in the pleasures of social intercourse with persons the most distinguished for their attachment to letters and science. With respect to theological subjects, his sentiments were rational and liberal, and he was a zealous friend to religious and civil liberty. In this respect his views and principles were conformable to those of the truly excellent bishop Hoadly.

In literary labour few persons have been more diligent and indefatigable than Dr. Birch. The first great work in which he engaged was, "The General Dictionary, Historical and Critical," comprehending a new translation of that of Mr. Bayle, and several thousand new lives, never before published. This valuable work was completed, principally by himself, with the co-operation of the reverend Mr. John Peter Bernard, Mr. John Lockman, and Mr. George Sale, in 10 volumes, folio. The first volume appeared in 1734, and the last in 1741. In 1737, he published "Professor Greaves's Miscellaneous Works," 2 vols. 8vo.; and in 1742, "Thurloe's State Papers," in 7 vols. folio, with a dedication to lord chancellor Hardwicke. In 1743, he edited "Cudworth's Intellectual System," his "Discourse on the Lord's Supper," and "Two Sermons," with a life of the writer, in 2 vols. 4to. His "Life of the Hon. Robert Boyle," 8vo. which has been since prefixed to the 4to. edition of that eminent philosopher's works, appeared in 1744; and in the same year he began a series of biographical sketches of distinguished persons, designed to accompany their engraved portraits by Howbraken and Vertue. The first volume of this work was completed in 1747, and the second in 1752. In 1747, he published in 8vo. "An Inquiry into the share which King Charles I. had in the Transactions of the Earl of Glamorgan, &c." a fact which, however overlooked, or disputed by some of our historians, was confirmed by the evidence adduced in this interesting publication, and has been since further corroborated by the Clarendon state papers. In 1748, Dr. Birch was the editor, in 2 vols. 8vo. of the "Miscellaneous Works of Sir Walter Raleigh," to which is prefixed a life of the author. His next publication was "An Historical view of the Negotiations between the Courts of England, France, and Brussels, from the year 1592 to 1617; extracted chiefly from the MS. state papers of sir Thomas Edmondes, and of Anthony Bacon, esq.; to which is added, a relation of the state of France, with the character of Henry IV. and the principal persons of his court, by sir George Carew," 8vo. 1749. To this volume Dr. Birch has prefixed a discourse on the utility of deducing history from the original letters and papers of the persons who were the principal actors in public affairs, followed by a biographical account of the three negotiations above-mentioned. Mrs. Cockburn's "Theological, moral, dramatic, and poetical works," 2 vols. 8vo. with the life of that ingenious lady, were edited by Dr. Birch in 1751; and he also published an edition of "Spenser's Fairy Queen," in 3 vols. 4to. One of his most popular works, which was "The Life of Archbishop Tillotson, compiled chiefly from his original papers and letters," and dedicated to archbishop Herring, in one volume, 8vo. appeared in 1752; and in the following year he revised an edition of "Milton's Prose Works," in 2 vols. 4to. to which is prefixed a new life of the author. In 1754, he published in 2 vols. 4to. "Memoirs of the reign of Queen Elizabeth, from the year 1581 till her death, &c. from the papers of Anthony Bacon, esq. and other MSS. never before published;" in which, besides a full display of the temper and actions of the earl of Essex, much light is thrown on the characters of the Cecils, Bacons, and other eminent persons of that period. Dr. Birch's next publication was "The History of the Royal Society of London, from its first rise; in which the most considerable of those Papers communicated to the Society, which have hitherto not been published, are inserted in their proper order, as a Supplement to the Philosophical Transactions." The two first volumes of this work appeared in 1756, and the other two volumes in 1757; and they bring down the history to the end of the year 1687. This is unquestionably an useful book of reference, and contains many particulars which may be of occasional service both to the philosopher and the biographer. In 1760, Dr. Birch published "Letters between Colonel Robert Hammond, Governor of the Isle of Wight, and the Committee of Lords and Commons at Derby-house, &c. concerning the King's deportment at Hampton Court, and in the Isle of Wight," 8vo.; and he closed his voluminous labours with "Letters, Speeches, Charges, Advices, &c. of Francis Bacon, lord viscount St. Alban's, &c. in one volume, 8vo." Soon after his death, Dr. Maty published, "The life of Dr. Ward," which he had just lived to finish; and he had also prepared for the press, "Historical Letters, written in the reign of James I. and Charles I." which Mr. Ayscough proposed to publish. In the list of his printed works we might also comprehend some papers communicated to the Royal Society, and some accounts of books in the works of the learned; but besides these, such was his unwearied assiduity in collecting every fragment pertaining to literature, and deemed by him of importance, that he left behind him 24 volumes 4to. of various papers copied by himself from the Lambeth library. Upon the whole, whatever may be thought of Dr. Birch's judgment in his selection of materials, of the minuteness of his researches, of the justice and sagacity of his inferences from the facts which he produces, and of the want of elegance and animation in his style, it must be allowed, that literature has already derived, and may yet further derive, great benefit from his labours. Biog. Brit.

Birch *tree*, in *Botany*. See Betula.

Birch, *bark, fungus, leaves, twigs, wine of*. See Betula.

Birch *bay*, in *Geography*, a bay on the coast of New Albion, situate in N. lat. 48° 53′ 30″. E. long. 237° 33′.

BIRCK, a town of Germany, in the circle of Westphalia, and duchy of Berg; 3 miles N. E. of Siegberg.

BIRD, Birds, *Aves*, in *Ornithology*. See Avis, and Ornithology.

Bird, or *fowl-mead grass*, in *Agriculture*, a species of grass, which has been lately cultivated with particular attention. It is a fine, sweet, silky grass, with a durable verdure; throws out a great crop, and produces a large quantity of seed. One rood of ground yielded a hundred weight of seed, and a very large load of hay. It is most proper for upland meadow: the seed should be left uncovered on the ground.

Birds, *Anatomy of*. The regard which has been bestowed upon this tribe of animals, by different descriptions of mankind, renders their organization one of the most interesting branches of general anatomy. The immense catalogue of the species of birds, and the variety and beauty of their external characters, have made them favourite objects of investigation with the natural historian. The extraordinary degree of instinct displayed in all their habits and economy, more especially in the attachment of the sexes, the construction of their nests, the care of their young, and the conduct of their migrations, has called forth the admiration of the philosopher and the lover of nature. The splendid colouring of their plumage, the powers of melody, and the livelinesss and docility of many species, have given them value as objects of beauty or entertainment; whilst others are

are as highly prized from furniſhing occupation to the ſportſman, or a delicacy to the epicure.

The anatomical characters of this claſs of animals are not leſs deſerving of attention than their other properties. In the ſcale of animated exiſtence, birds can ſcarcely be conſidered inferior to mammalia; and yet many of their functions are exerciſed upon a very diſſimilar plan, and almoſt conſtantly by organs differently conſtituted. It is in birds that we perceive the firſt general deviations from the ſcheme of organization purſued in the human ſubject: this will be found moſt remarkably exemplified in the apparatus for the preparation and digeſtion of food, the ſecretion of urine, the mode of generation, and the growth and economy of the young animal, the anatomy of the brain, the ſtructure of the eye and ear, the mechaniſm of the organs of ſound, and the conſtruction of the inſtruments of loco-motion.

The anatomy of birds has been much proſecuted both by the older authors and in modern times, as the means of phyſiological knowledge, and in aid of the ſeveral purpoſes for which theſe animals are ſo much eſtimated. The information, however, communicated in this way, falls far ſhort of a ſyſtematic account of the ſubject; to ſupply which, therefore, much original matter is neceſſarily introduced into the preſent article, more particularly in the deſcriptions of the blood-veſſels, of the organs of motion, and of the minute ſtructure and uſes of parts. Many errors of the older writers are alſo corrected; and wherever the deſcriptions of others are followed, they have been, as far as it has been practicable, reviſed by a compariſon with the recent ſubject or authentic preparations.

Organs concerned in the Exercise of the vital Functions.

The Mouth and its contained Parts.

In the other claſſes of animals, theſe parts are conſtructed to effect the diviſion of the food previous to its paſſage into the ſtomach, but in birds the proceſs of maſtication is either imperfectly performed, or carried on by a peculiar mechaniſm to be afterwards deſcribed. Birds are unprovided with thoſe ſoft and flexible parts called lips; the aperture of their mouth is made by the prolongation of the two jaws, which are covered with a hard and horny ſubſtance. Theſe are named the upper and the lower *mandibles*, and together form the *beak* or *bill*. The bones which enter into the compoſition of the bill, will be conſidered along with the other parts of the ſkeleton. The external or horny part is produced, like other ſimilar ſubſtances, from a vaſcular and ſpongy membrane, which is interpoſed between it and the bones; it correſponds exactly in ſhape with the jaws, which ſerve it as a mould.

The bill is deſigned for many different purpoſes, and conſequently is ſubject to great variety in its conformation. In the birds of prey it is ſtrong, hooked, ſharp, and furniſhed with a tooth-like proceſs on its edge, to enable them the better to ſeize and lacerate their prey; thoſe birds which ſubſiſt on ſmall grain, are provided with ſhort, pointed, ſharp-edged bills for picking up and breaking their food; the parrots alſo uſe their bills for dividing their meat; in thoſe inſtances, therefore, the bill may be conſidered analogous to the teeth of other animals; but it is only the incifors with which it can be compared, as it is incapable both from its thin edges, and from the nature of the articulation of the lower jaw, of performing any thing like the grinding motion in which properly maſtication conſiſts.

The *piſcivorous* birds have commonly large and extended bills, which become neceſſary to them, in order to ſecure their prey; theſe birds almoſt always ſwallow their food without dividing it.

Swallows and *goat-ſuckers* have ſhort bills, but opening very wide, ſuitable to their mode of procuring their food, which conſiſts in taking flies while the bird is on the wing.

The *wood-peckers*, *wry-necks*, *nut-hatches*, &c. uſe the bill as an inſtrument for perforating the bark of trees, and breaking nuts; for which purpoſe it is conſtructed like a wedge.

It may, in fine, be given as a general obſervation, that the form and ſtructure of the bill indicate the proper habits and ecomomy of the birds; they have therefore been always employed by naturaliſts as claſſific diſtinctions, and to their works we refer the reader for a more detailed account of the peculiarities obſerved in the bills of birds.

In conſequence of a particular mechaniſm, ariſing from two additional bones, the upper jaw of birds is capable of a certain degree of motion. In general this is very confined, but the *parrot* tribe are able to move the upper jaw with conſiderable freedom. The bones and muſcles upon which this peculiarity depends, will be deſcribed with the organs of motion.

The *cavity of the mouth* is lined with a thick vaſcular membrane, behind which are placed a great number of follicular glands, which diſcharge a mucous liquor upon every part of the ſurface of the mouth. They are, however, moſt abundant in thoſe parts which ſuſtain moſt friction, as the commencement of the œſophagus, and ſurrounding the aperture of the nares, in the upper and back part of the mouth.

A cuticular tunic is ſpread over the glandular membrane, which is as uſual ſo ſoft and delicate, that it cannot without difficulty be detected.

The *tongue of birds* can hardly be conſidered an inſtrument of manducation; its motions are very limited, in conſequence of its containing a bone which runs through its whole length, and the lingual bone being articulated behind with the os hyoides, which determines the extent of its movements. The only birds, in which the tongue is immediately concerned in the diviſion of the food, are thoſe *paſſeres* living upon ſeeds that are incloſed by a ſhell. In ſuch the tongue is employed to convey the ſeed between the edges of the bill, and ſecure it there until it is broken, which is not unlike the action of the tongue of mammalia during maſtication.

The tongue of the *wood-peckers* and *wry-necks* is an organ of curious ſtructure, and enables theſe birds to transfix their prey at ſome diſtance from the mouth; the mechaniſm by which this is accompliſhed, and the bones and muſcles which belong to the tongue in general, will be particularly deſcribed with the other organs of motion. The varieties in external form, and the ſtructure and integuments of the ſubſtance of the tongue, will be conſidered under the head of the organ of taſte.

Salivary glands have been aſcribed by moſt authors to birds; but, as it would appear, without duly conſidering the uſes of theſe parts. Birds, as already obſerved, do not comminute their food by maſtication in the mouth, for which purpoſe the ſaliva is employed by other animals; and the glandular bodies, which have been deſcribed as ſalivary, appear to yield a fluid of rather a mucous than an aqueous nature. The internal ſurface of the mouth of birds is beſmeared with mucus, in order to facilitate the paſſage of the food, which would not be neceſſary, if the aliments were ſoftened by ſaliva.

The reputed ſalivary glands of birds are ſituated within the angle formed by the anterior part of the lower jaw, and between the ſkin and the inner membrane of the mouth. They are two in number, and appear to be compoſed of granular maſſes, or follicles, cloſely connected to each other. They diſcharge their ſecretion into the lower part of the mouth, by means of ſome foramina arranged on each ſide of

the

the tongue. They would ſeem to be of the greateſt ſize in proportion to the bird, where the food is hard and dry grain; they are larger in the *common fowl* than in the *gooſe*.

The Pariſian academicians obſerved theſe glands in almoſt every bird they diſſected. In the *oſtrich* they deſcribe them as being ſituated towards the pharynx; and in the *buſtard*, they found ſeveral glandular bodies.

Oeſophagus.

The tube, which conveys the food into the ſtomach of birds, is not ſituated exactly on the fore part of the neck, but a little on the right ſide. It is partially covered by the trachea, and it is connected to all the neighbouring parts by looſe cellular ſubſtance; in conſequence of which, and its inclination to one ſide, when the neck is much bent, it does not take the ſame degree of flexure, but falls a little off to the right ſide. This effect is beſt obſerved in ſome of the birds which have long and flexible necks, as the *grallæ* and *water birds*.

The form of the œſophagus varies according to the habits of the bird, and the nature of its food. In the rapacious birds, and thoſe which ſubſiſt on fiſh, it is of great capacity throughout its whole length, generally exceeding in width the ſtomach itſelf. The magnitude of the œſophagus not only enables thoſe birds to ſwallow their prey whole, but anſwers the purpoſe of a repoſitory for their food, and thus counterbalances the diſadvantages ariſing from their precarious means of ſubſiſtence.

Herons, the *cormorant*, the *ſpoon-bill*, &c. will devour as much fiſh at once as will be ſufficient to ſupport them for a conſiderable time; and an *owl* is often obliged to exiſt for days or weeks upon a rat or mouſe, which being ſwallowed, is conveyed by degrees into the ſtomach, until the whole is digeſted.

All the *piſcivorous* birds have the œſophagus moſt capacious at its commencement, or next the fauces, for the more convenient ſwallowing of their prey, which is always gulped down.

The *pelican* furniſhes a moſt remarkable inſtance of a dilatation of the fauces, in the pouch which is placed beneath the lower jaw. This bag, if full, is very conſpicuous externally; but when it is empty, the bird has the power of contracting it very conſiderably; when completely diſtended, it is ſaid to be capable of containing ten quarts of water. The internal part of the pouch appears to poſſeſs the ſame ſtructure as the reſt of the œſophagus; the ſkin covering it externally, is clothed with a ſhort down, ſmooth and ſoft, like ſilk.

The *pelican* derives a double advantage from this enlargement of the fauces; it enables it to provide a ſupply of food and water for future neceſſity, and to tranſport nouriſhment to its young, until they can acquire it for themſelves: in diſgorging the food for her family, the parent preſſes the bottom of the ſack againſt her breaſt, and thus diſcharges its contents; from which probably aroſe the abſurd fable of her opening her breaſt, and feeding her young with her blood.

A very remarkable proviſion of this kind has been deſcribed in the *buſtard*, by Dr. James Douglas. In this animal there is a membranous bag, extending for ſome way down the fore part of the neck, capable of containing ſeven quarts of water; it communicates with the mouth by an aperture beneath the tongue. See *Plate* I. *fig.* 1. in the *Anatomy of Birds*, in which this part is repreſented, as it has been figured in Edwards's Natural Hiſtory of Birds, vol. ii. p. 73. *a* the pouch, upon which a ligature is faſtened near its connexion with the mouth, *b* the trachea, and *c* the œſophagus.

Th pouch of the buſtard is confined to the male bird, according to moſt authors; ſome have, however, aſcribed it to the female, and others have doubted its exiſtence altogether. The Pariſian academicians diſſected ſix buſtards, and do not deſcribe the throat ſac, although all their ſubjects were males.

The buſtard is ſaid to uſe the pouch as a temporary reſervoir of water, from which it ſupplies the female during the period of incubation, and likewiſe the young brood, until they can move from the neſt. It has been alſo occaſionally employed as the means of defence. Barrington relates in his Miſcellanies, p. 553. that at Morocco, where it is uſual to fly the hawk at the buſtard, the latter has been known to eject the water contained in the ſack againſt his aſſailant, who is not uncommonly by this means baffled in the purſuit.

The *crop*, or *craw*, is a term applied to another ſpecies of dilatation of the œſophagus of birds.

When this enlargement is ſingle, it is ſituated upon the right ſide of the œſophagus, and placed ſo low on the neck, that a portion of the bag is accommodated in the ſpace left at the upper part of the thorax, within the fork-ſhaped bone. Its form is in general globular, but rendered ſomewhat irregular, from its connexion with the œſophagus, which enters at the ſuperior part, and appears again on the middle, by which means the greater part of the crop is formed into a cul de ſac.

It is obvious, that the effect of this ſtructure is not only to receive a greater quantity of food than can be digeſted, but alſo to detain it in the craw until it has ſuffered ſome change.

The birds in which the craw is found of the figure juſt deſcribed, feed uſually upon grain or other hard ſubſtances, which require to be ſoftened by maceration in the mucous ſecretion of the œſophagus. Of theſe we may mention as inſtances, the *pheaſants*, the *common fowl*, the *pintado*, the *turkey*, the *Indian cock*, the *pea-fowl*, &c.

Fig. 2. of *Plate* I. in the *Anatomy of Birds*, exhibits the crop of the *pheaſant*, *a* the œſophagus above the craw, *b* the ſame going on to the ſtomach, *c* the dilated part forming the crop.

The Pariſian anatomiſts found the œſophagus very much enlarged in the *oſtrich*, but ſo cloſe to the gizzard that theſe two parts appeared to be confounded with each other; ſo that it was difficult to mark the ſuperior orifice of the ventricle; the ſituation of the bag alſo was very unuſual, being lower than the gizzard, into which the entrance was by the bottom, and thus what is commonly called the ſuperior orifice, was really the inferior.

It is ſomewhat remarkable, that the *buſtard*, which is a graminivorous bird, and in moſt reſpects reſembles thoſe which have crops, ſhould be quite without this proviſion, its œſophagus conſiſting of an equal and regular tube.

The *parrot* has a dilatation of the lower part of the œſophagus, which is commonly reckoned to be a crop, though perhaps improperly, as the enlargement is neither ſo ſuddenly produced, nor in ſuch a degree, as to obſtruct the paſſage of the food into the ſtomach; the craw of the parrot is only calculated, therefore, to afford a temporary accommodation to its food.

Some *carnivorous* birds are furniſhed with a craw, which only ſerves the purpoſe of a reſervoir, as their food does not ſtand in need of maceration to ſoften it, which is ſo neceſſary with hard and dry grain.

The moſt ſingular kind of crop is that found in the *pigeon* genus. The œſophagus in theſe birds is of great capacity, from its very commencement, and at its lower part it ſwells out into two large ſacks, between which and the ſtomach it ſuffers a conſiderable contraction. See *Plate* I. of the *Anatomy of Birds*, *fig.* 3. *a* the upper portion of the œſopha[illegible],

b, *b*,

b, *b*, the two crops, *c* the contracted part of the œsophagus.

In some species, as the *pouting pigeon*, the œsophagus above the crops, is of such great dimentions, that the latter are hardly discernible; these birds also have the power of distending their œsophagus with air, which gives them that grotesque appearance from whence they derive their name. A capacious crop is more necessary to the pigeon than other birds, both because its food requires long maceration, and because the young, and even, on some occasions, the female, draw their subsistence from this repository. The extraordinary change which occurs in the structure of the inner membrane of the crops of the pigeon, by which a milky fluid is secreted, for the nourishment of the young birds, will be described in its proper place.

Although there is all the variety in the form of the œsophagus we have described, the internal structure appears to be the same in all birds. Besides the external cellular covering, by which it is connected to the adjacent parts, it possesses a muscular coat, an internal vascular tunic, and a cuticular lining. The muscular coat consists of two layers of fibres; in the external layer these are transverse, or more properly circular; the other stratum is composed of longitudinal fibres. The muscular coat is most strongly marked at the top of the tube, where the actions of deglutition commence, and upon the crops, where support and motion are required. The internal coat resembles in structure that which is usually met with upon the inner parts of cavities; with this difference, that it is provided in birds with an extraordinary number of follicular glands, which pour out their fluid through numerous foramina, resembling pin-holes, upon the internal surface. These glands secrete a quantity of mucus, which is employed in macerating the food, while it is detained in the œsophagus, or crop. This secretion is remarkably copious. Spallanzani introduced a piece of sponge into the crop of a *pigeon*; and after it had remained there twelve hours, he expressed from it above an ounce of mucus, and the quantity obtained from a *turkey*, amounted to seven ounces in ten hours. The follicular glands are most numerous at the commencement of the œsophagus, and towards the termination of this tube in the stomach, the inner surface of the craw is but sparingly supplied with them. See *Plate* I. of the *Anatomy of Birds*, *fig.* 2. in which the œsophagus and crop are inverted, for the purpose of exhibiting the orifices of the mucous follicles, and in *fig.* 3. they assume a beautiful and regular appearance below the dilated parts of the œsophagus. It is very common for the mucous glands to be assembled in a regular and marked manner round the very termination of the œsophagus, as *a* in *Plate* II. *fig.* 2. of the *Anatomy of Birds*.

The cuticle, which invests the œsophagus, is generally so thin and tender, that it might escape observation. It is, however, sufficiently plain in many large birds, and almost always visible, upon the inside of the crop or the other dilated parts, which are more exposed to friction from extraneous substances. The insensible lining of the œsophagus terminates abruptly at the zone of gastric glands.

It may be remarked with respect to the œsophagus of birds, that its chief peculiarities consist in the great size, occasional enlargement, and number of mucous glands. These circumstances necessarily depend upon the very singular structure of the stomach, which we shall next describe.

Stomach.

The organ of digestion in birds consists of two parts; one for producing the digestive fluid; the other the receptacle in which the conversion of the food is effected. The apparatus for the secretion of the gastric juice is called,

The Bulbus glandulosus, or the Zone of Gastric Glands.—This part is situated at the termination of the œsophagus, and appears in most instances to be the continuation of that tube. It has the same cellular and muscular coats, which obscure its real structure, when perceived externally, especially in the graminivorous birds, which have strong muscles upon the œsophagus. When the outer tunics are removed, a number of small glandular bodies are exposed, arranged with the most perfect regularity, and closely applied to each other. They assume an indistinct granular appearance in small birds generally, and even still more so in those which subsist on animal food, as the *accipitrine* and *piscivorous* birds; but in the *gallinæ*, and the large *graminivorous water* birds, as the *swan*, the *goose*, &c. the gastric glands, when divested of their coats, are readily discovered, by the naked eye, to be small cylinders, or tubes, placed horizontally with respect to the parietes of the stomach; the external end is close and of a round figure; the internal extremity of the tube is somewhat concave, and contains a small foramen, which is applied to a corresponding hole in the internal membrane of the bulbus glandulosus. See *Plate* II. in the *Anatomy of Birds*, *fig.* 1. *a* represents a number of the gastric glands, with their external extremity exposed, by a portion of the muscular coat being removed; and in *fig.* 2. *b* shews the orifices of these glands upon the internal coat of the stomach, and *c* the cut edge of the bulbus, with the cylinders as they are placed between the muscular and internal coats. The subject of both the figures is the *wild swan*.

The gastric glands commonly encircle the beginning of the stomach as a perfect and equal zone. In some instances, however, where they are not large, as in the *rapacious* and *piscivorous* birds, they are more numerous at one part of the stomach than another; see *Plate* III. *fig.* 2. which exhibits the stomach of the *heron*, *b b* the gastric glands.

The form of the bulbus is not quite regular in the *ostrich*; the structure of the glands also is not the same as in other birds: instead of being placed in regular and close order, they are disposed in masses of an unequal form and size, separated for some distance from each other. On making a section of the masses, they are found divided, or interrupted by processes of strong white cellular substance; from which it would seem, that they are composed of several glands, although there is but one foramen belonging to each mass on the internal tunic of the bulbus. The magnitude of the orifices of the gastric glands, even exceeds the proportion to be expected from the size of the bird; being capable of receiving the head of a large pin, they stand at the distance of about the 4th of an inch asunder, and do not open with perfect regularity upon the internal surface of the stomach, being most crowded towards the centre, where also their apertures are largest; the internal tunic of the ostrich, from these circumstances, exhibits a worm-eaten appearance.

The gastric glands in all birds like other parts, which produce an important secretion, are endowed with an extreme degree of vascularity.

Some authors have described a cuticular coat, on the internal surface of the bulbus glandulosus, which they have compared to velvet on account of its soft and spungy texture; it appears, however, very doubtful, whether this covering should be considered a tunic or not; we have observed that it is readily detached, and soluble in water; it certainly bears no resemblance to the epidermis of the œsophagus, and still less to the substance which invests the remaining portion of the stomach, or gizzard.

No very satisfactory experiments have yet been made upon the nature of the digestive fluid of birds. When it is expressed from the gastric glands, which is the only mode of obtain-

obtaining it pure, it is observed to be of an ash or pale yellow colour, turbid, and of a tenacious consistence, like mucus. Spallanzani found it in several birds to have a bitter and salt taste, which he attributed to admixture with some of the fluids contained in the intestines; he discovered also, that the turbidity and the colour were produced by the existence of a number of yellow particles, too minute to be distinctly seen without the aid of the microscope, and which in a few hours subsiding to the bottom, left the supernatant liquor as transparent as water. He has remarked the yellow tinge to vary in intensity, according to the species; in the *eagle*, for instance, it is cineritious, and in the *crow* a reddish yellow colour, like the yolk of an egg.

A number of the experiments performed by Spallanzani, although in some instances he failed, shew that the gastric fluid of *carnivorous birds* will act upon vegetable matters; and upon the other hand, that graminivorous birds can digest animal food: but his most interesting and important experiment on the properties of the gastric fluid, is that made to determine its powers of resisting the operation of cold. "On "a very cold day in winter," he says, "I exposed a small "quantity (of the gastric juice of the eagle) in a glass, on a "window, along with two other glasses containing water, in "one of which was dissolved a quantity of common salt, suf-"ficient to give it a stronger taste than the gastric fluid had. "The thermometers set beside the glasses stood at five degrees "below o (twenty and three-fourths, Faren.). Of the three "liquors, the first that was frozen, was the common water, "the next was the salt water, and the last was the gastric fluid. "When I carried them into my apartment, where the tempe-"rature was three and an half deg. above o. the first that "thawed was the gastric fluid, next the brine, and lastly the "water." The conclusion which necessarily results from this experiment is, that the gastric juice of birds, and from analogy, that of other animals, is capable of resisting the effects of cold more than common fluids, or even those impregnated with a great quantity of salt; and therefore it may be considered as possessing some degree of vitality. If this supposition be admitted, it determines the nature of the digestive process, so long a question in physiology.

The gastric fluid of the *crow* has been submitted to chemical examination by Scopoli, by which he discovered that it contained a quantity of gelatine and saponaceous substance, some muriate of ammonia, and phosphate of lime, with a large proportion of water.

The second part of the organ of digestion of birds, is not less singular than the structure just described; it immediately succeeds the zone of gastric glands, and when in the natural situation, occupies the left region of the abdominal cavity, in which position it is retained by the several reflexions of peritoneum, which constitute the air cells. From being the part into which the food is received in order to undergo the process of digestion, it has commonly received the distinctive appellation of *stomach:* but it would seem more consistent, not only with the form of the digestive organ in some birds, and with its functions in other animals, to apply the term *stomach*, both to the gastric glands, and to the muscular bag which immediately receives their secretion, and the food; or for the greater convenience and clearness of description, the lower portion of the stomach might be distinguished from the bulbus glandulosus, by the name of *ventricle*.

The greatest variety exists with respect to the structure of this part of the organ of digestion in birds: when it possesses a certain degree of muscularity, it is well known under the name of the *gizzard;* and when its muscles are so thin as to give it the appearance of a simple bag, it is commonly, though erroneously, called a membranous stomach.

Fourcroy attempted to establish two classes of birds, according to the formation of their stomachs, calling the one *myogastriques*, and the other *hymenogastriques*, but these terms were only applicable to the two extremes.

Vic d'Azir has admitted three distinctions in the structure of the ventricle; the first that of the true gizzard, of which he gives instances in the *gallinæ*, the *swan*, the *goose*, &c.; the second where the muscles which compose the gizzard are not distinct from the other parts, nor very strongly marked, as in the *thrush* and *jay;* the third is the membranous stomach as it is called, which is found in the *heron*, *eagle*, *cormorant*, &c. See the introduction to Vic d'Azir's great System of Anatomy.

These distinctions are not, however, just; the gradation from the most muscular gizzard to the thinnest ventricle, is regular and uninterrupted; in order to understand which, and the other variations in structure, it is necessary that the true gizzard, or muscular stomach, be first described.

The external form of this organ is usually an irregular oval, the two ends of which are made of the great *lateral* or *digastric* muscle.

This muscle constitutes the principal mass of the gizzard; its attitude with respect to the bulbus glandulosus is oblique. The two fleshy portions are united by means of a strong flat tendon, on each side of the gizzard, which in the centre is distinct from the parietes of the ventricle.

The portion of the stomach, which appears between the two fleshy masses of the digastric muscle, and which is crossed by the tendon, belongs to the cavity of the ventricle; it is composed of fleshy fibres, passing in several directions, as may be most convenient for diminishing the cavity. Many of these fibres are continued into the substance of the digastric muscle, and others run in its outer margin, thus giving integrity and connexion to these two portions of the ventricle. See *Plate* II. *fig.* 1. in the *Anatomy of Birds*, which represents the external appearance of the stomach of the *wild swan*, *b b*, the fleshy parts of the digastric muscle, *c*, the tendon connecting them to each other, *d*, the parietes of the ventricle on the superior part, *e*, the same, inferiorly, *f*, the margins of the digastric muscle, with fibres passing along them.

The disposition of the fibres in the interior of the digastric muscle is exceedingly curious. They appear, upon a superficial view, to be arranged in thin concentric laminæ, separated from each other by the most delicate tendon. These layers pass to the lateral tendons on the circumference, so that their force is exerted upon them. See *Plate* III. *fig.* 1. which is the section of the gizzard of the *goose*, *a a*, the two great masses of the muscular substance, *b b*, the tendons by which they are connected to each other. But if another section be made, parallel to the sides of the gizzard, or across the concentric layers, we have found each of the laminæ to be divided by a great number of delicate tendinous processes which form with each other squares and triangles of various shapes, producing a reticulation, not unlike a honeycomb. The extraordinary multiplication of muscular fasciculi, which arises from the lamellated and reticulated structure of the gizzard, creates a force which almost surpasses calculation.

On laying the gizzard open by cutting through the tendon, which is the thinnest part, it is observed to be covered internally with a rude, callous substance, of a dark brown colour; this is thin and pliable upon the portion of the ventricle, not inclosed by the digastric muscle, and partakes of the motions of the cavity; but when it covers that muscle, it becomes as tough and inflexible as the hoof of a quadruped; two oval surfaces are seen to project beyond the other parts; they are raised upon the interior of the thickest portions of the digastric muscle, and the horny integument

when paſſing over them acquires nearly the thickneſs of an eighth of an inch. *Plate* II. *fig.* 2. in the *Anatomy of Birds*, ſhews the gizzard of the *wild ſwan* laid open, *d* the divided tendon, *e* the cuticular or horny covering of the gizzard, ending decidedly at the commencement of the inteſtine, and below the zone of gaſtric glands; at the latter place the edge is ſhewn detached, *f f* the two prominent oval ſurfaces, *g g* the origin of the inteſtine, which being cut off ſhort on the outſide permits the light to appear through it.

The cavity of the gizzard differs very much in ſhape and extent from what might be expected, from the external figure of that organ. When all foreign matters have been expelled, the two prominent oval ſurfaces approach each other, leaving only a ſlit between them: any thing that deſerves the name of a cavity, is ſituated above and below the place where the tendons croſs (ſee *Plate* II. *fig.* 2.), for juſt within the tendon there is not cavity ſufficient to contain the end of a finger. See *Plate* III. *fig.* 1. which ſhews a ſection in which the two oval ſurfaces are applied to each other, leaving at either end the appearance of a round hole, by means of which the ſuperior and inferior cavities of the ventricle have communication.

When the horny or inſenſible lining is removed, there appears another coat to the gizzard. This is ſoft, ſomewhat ſpongy, and endowed with vaſcularity; it is intimately united to the muſcular ſubſtance of the ventricle, on one ſide, and on the other affords a ſurface for the adheſion of the horny coat; the connexion with which appears to depend upon the mutual inſertion of villous proceſſes, too fine to be diſtinctly perceived by the naked eye.

Such is the deſcription of the muſcular ventricle, or *true gizzard*, as it exiſts in the *ſwan*, the *gooſe*, the *duck*, the *pheaſant*, and *common fowl*, the *pintado*, the *turkey*, and a few others. In by far the greater number of birds, there is a deviation from the ſtructure of the gizzard. The digaſtric muſcle is leſs powerful, its tendon is incorporated with the parietes of the ventricle; the oval, or grinding ſurfaces, are little or not all diſtinguiſhable from the reſt of the cavity, which is therefore of larger capacity; and, laſtly, the ſubſtance lining the ventricle is leſs tough, thick, and hard, approaching more to the nature of cuticle. It would be endleſs to enumerate all the different inſtances of intermediate ſtructure, which we and others have obſerved; ſuffice it to ſay, that it exiſts in almoſt all the *paſſeres*, or ſmall birds which ſubſiſt upon a mixed food, ſuch as grain, worms, inſects, and fruits; alſo in moſt of the order *ſcanſores*, and in many of the *grallæ* and *anſeres*, which are purſued as game. In all which inſtances the deviation from the true ſtructure of the gizzard varies in degree according to the nature of the food uſed by the bird; nay, differs from this cauſe in the ſame individual. Thus the *gull* has a ſtrong muſcular ventricle, when fed upon grain, which, if the bird be ſupported by fiſh, becomes ſo thin as to approach the membranous ſtomach.

It is remarkable, that many birds which live upon grain and hard ſubſtances, have neither a very muſcular ventricle, nor the horny integument very thick. This is the caſe with all the *ſtruthious* birds, and ſome *gallinæ*, as the *buſtard*.

The ſtomach of the *oſtrich* is capacious; the digaſtric muſcle is thin, conſidering the ſize of the bird, and the nature of its food; and the cuticular coat is ſo ſoft, that it has been aptly compared by ſeveral authors to flannel. The Pariſian anatomiſts deſcribe the ſtomach of the *caſſowary* as being thinner than that of the *oſtrich*, and divided into two parts by a valvular projection of the inner coat.

When the digaſtric muſcle becomes ſo thin as to form a mere layer of fibres, in cloſe union with the other coats of the ſtomach, and its tendons only fine aponeuroſes, expanded on each ſide, the ventricle is termed *membranous*; an improper appellation, inaſmuch as the very ſame parts exiſt, which belong to the powerful and maſſy gizzard, although in a diſguiſed and diminiſhed form, and unequal to the ſame functions; affording thus a curious example of the uniformity with which nature copies her own works.

This ſpecies of ſtomach is almoſt confined to the *accipitrine*, or rapacious birds, and thoſe amongſt the *grallæ* and *anſeres*, which feed on fiſh. The *woodpeckers* alſo poſſeſs it, and probably it may be found in ſome foreign birds, which live on inſects and ſoft fruits.

The ſubſtance lining the membranous ſtomach is much thicker than common cuticle. It is occaſionally ſoft, and almoſt of a gelatinous conſiſtence, and eaſily detached from the internal coat of the ventricle.

The ſhape of this kind of ſtomach is uſually a ſemi-oval, or the ſection of an egg. Several of the *piſcivorous* birds, as the *heron*, *bittern*, *pelican*, &c. have, however, a ſecond chamber, through which the food paſſes in its way to the inteſtine. See *Plate* III. in the *Anatomy of Birds*. *Fig.* 2. is the ſtomach of the *heron*; *a* the lower part of the œſophagus, appearing ſmaller than it really is, from being thrown into folds; *b* the zone of gaſtric glands, diſtinctly ſeen through the coats of the ſtomach, in conſequence of the cavity being diſtended with a tranſparent fluid, and afterwards placed againſt the light. If Spallanzani had employed the ſame expedient, he could not have denied the exiſtence of a diſtinct glandular ſtructure to the *heron*; *c* the inferior part of the ſtomach, chiefly compoſed of muſcular fibres, ſpreading in a radiated manner from the lateral aponeuroſis; *d*, which ſupplies the place of the great tendons of the digaſtric muſcle; *e* the ſecond ſtomach, furniſhed with circular muſcular fibres; *f* the firſt inteſtine ariſing from the additional ventricle. The communication between the two ſtomachs is very ſtraight in the *pelican*.

Having deſcribed the ſtructure of the digeſtive organ of birds, it remains to conſider its functions. In thoſe caſes where the muſcular power of the ſtomach is inconſiderable, and the cuticular coat thin and ſoft, digeſtion is carried on in the ſame way as in man and other animals, with this difference only, that the gaſtric fluid is furniſhed by a diſtinct apparatus of glands, inſtead of being ſecreted by the whole ſurface of the cavity. In the true gizzard, however, we perceive an extraordinary departure from the common ſtructure of the organs of digeſtion. This part ſupplies the place of the teeth of other graminivorous animals. In its mechanic powers and action it reſembles a mill: the upper part ſerves as the receptacle for the grain; the two internal projecting oval ſurfaces correſpond to the mill ſtones, and the firſt inteſtine receives the ſubſtances in the ground or divided ſtate. The experiments made at the academy of Cimento, and thoſe of Reaumur, Spallanzani, and others, ſhew that the gizzard is a machine of no ordinary powers. Theſe experiments conſiſted in compelling birds to ſwallow hard and unyielding ſubſtances, and, after ſome hours, examining what were the effects produced upon them.

When balls of glaſs, or other brittle ſubſtances, were employed, they were ſpeedily reduced to powder: metals and precious ſtones were indented or abraded. Spallanzani introduced into the gizzard of the turkey, and common fowl, leaden balls, armed in one inſtance with twelve ſharp needles, one quarter of an inch long; and in another, ſet with as many lancet points. Upon deſtroying the birds 18 hours afterwards, the needles and lancets were found broken off, and marks of impreſſion appeared even upon the balls themſelves; and, what he conſidered more extraordinary, the coats of the gizzard were perfectly unhurt. When we con-

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ſider the immenſe ſtrength which is obtained by the arrangement of the muſcular fibres in the gizzard, and the horny conſiſtence of its inner coat, there appears nothing incredible in theſe effects. And there is ſtill another circumſtance, not before mentioned, which fully accounts for ſuch extraordinary powers of trituration: every muſcular ſtomach or gizzard contains a number of ſmall ſtones or pebbles; the ſize of the ſtones is proportioned to that of the bird. Their number is ſubject to vary from many accidental cauſes. Two hundred have been reckoned in a *turkey-hen*, and above a thouſand have been taken from the gizzard of one *gooſe*.

Spallanzani denied that theſe ſtones were at all required for the comminution of the food. He has endeavoured to ſupport his opinion by ſeveral experiments, which are, however, not clear or conſiſtent with each other, and in contradiction to general obſervation; for it is well known, that birds do not thrive when they cannot obtain ſmall ſtones, and that it is part of the duty of the parent to provide them for their young, before they leave the neſt. Spallanzani acknowledges that he could not procure any bird ſo young, that it had not ſome ſtones in its gizzard; and therefore he was obliged to rear pigeons and turkeys even from the ſhell, before he was able to ſucceed. Birds, ſo far from ſwallowing ſtones from keenneſs of appetite, or in miſtake for food, ſeek out and ſelect thoſe moſt ſuitable to their purpoſe, which are almoſt all bits of quartz, of an equal ſize, and a roundiſh figure, with many ſmall ſharp angles.

Large birds, as the *ſtruthious* kind, the *buſtard*, &c. are in the habit of ſwallowing coins and pieces of metal, which neceſſarily ſuffer a reduction by the friction to which they are expoſed; and hence has ariſen the ridiculous notion of the *oſtrich* digeſting iron.

We have no heſitation in deciding, that the extraneous bodies found in the gizzard are abſolutely required for the perfect diviſion of the food uſed by thoſe birds that employ them. In further proof of which opinion it may be mentioned, that they are proportioned in quantity to the degree of muſcularity poſſeſſed by the ventricle, and the nutritive quality of the food; and that thoſe birds which have thin ſtomachs, and live upon animal food, never deſignedly ſwallow ſtones, or other indigeſtible ſubſtances.

In order to aſcertain the mode of operation of the gizzard in the living body, Reaumur opened ſeveral fowls during the proceſs of digeſtion. One inſtance alone ſhewed any motion in the part, which conſiſted in alternate contractions and dilatations, ſlowly and gradually performed. Spallanzani inſtituted ſimilar experiments upon ſeveral birds, with no better ſucceſs, being ſeldom able to detect the leaſt motion; and when he did perceive any, it was irregular, partial, and indiſtinct. This he attributed to the violence committed by opening the animal's body, which no doubt cauſes the motions to be leſs ſtrong and regular; but the gizzard's exhibiting externally ſo little action, depends upon the diſpoſition of the fibres in the interior of the digaſtric muſcle, which are calculated, not for performing extenſive motions, but for exerting an immenſe concentrated force upon whatever may come within their influence.

The moſt ſatisfactory, as well as convenient, mode of examining the actions of the living gizzard is, to provide a very lean, young bird, which has thin parietes to the abdomen. The ſide of the belly being deprived of feathers, all the motions of the gizzard can be both felt and ſeen. We have thus aſcertained them to conſiſt in alternate contractions of the digaſtric muſcle, and of the intermediate parts of the ventricle. When the muſcle acts, its figure is not perceptibly changed, but it feels as hard as a ſtone: upon its relaxation, the parietes of the ventricle urge their contents again between the two grinding ſurfaces, when the muſcle repeats its powerful contraction, by which the ſubſtances interpoſed are ſubmitted to a preſſure like that of a vice, accompanied by a ſlight rolling motion of the ſurfaces upon each other. Theſe alternate actions ſucceed each other very ſlowly, but with regularity.

When the food and ſtones roll under the preſſure of the digaſtric muſcle, a ſound is heard exactly like what is produced by the tide coming upon a ſhore, where there are many looſe ſtones. This occurs with the ſame intervals of time, alſo, which are obſerved between the flux and reflux of the tide; and if the ear be applied to the body of the bird, during the time that the gizzard is in action, the ſound of the ebbing and flowing of the tide is imitated ſo perfectly in loudneſs, and every other reſpect, that it is difficult to conceive it is occaſioned by any other cauſe.

During the time that the food is undergoing a very minute diviſion, in the manner deſcribed, the gaſtric juice is diſtilled from the bulbus glanduloſus in greater quantity than uſual, and a more intimate mixture is formed of the digeſtive fluid and the triturated food, than could be accompliſhed under any other circumſtances; and therefore we may look upon the proceſs of digeſtion in graminivorous birds, as not only more complicated, but more perfect than it is in animals in general.

Inteſtines.

Theſe are divided in birds, as in other animals, into great and ſmall, although the terms are not very appropriate; there not being in general any material difference in the magnitude of each.

The *ſmall inteſtines* exceed the large very much in length; they are ſituated chiefly in the anterior and right ſide of the abdomen, where they are ſtrictly confined by the proceſſes of peritoneum, which form the air-cells. The convolutions of the inteſtines are very regular, and conſiſt in ſucceſſive doublings one ſhorter than another, which give the appearance, on opening the abdomen, of a coil of rope, particularly in thoſe birds which have the ſmall inteſtines of conſiderable length. This effect depends upon the figure of the meſentery, which is not compoſed in quite the ſame manner as in mammalia.

The diſtinction of the ſmall inteſtines into duodenum, jejunum, and ilium, is at all times to a certain degree arbitrary, and is ſtill leſs allowable in birds. The only portion which deſerves to be diſtinguiſhed from the reſt of the tube, is the firſt coil; which aſcends on the right ſide of the ſtomach, including in its reflection the pancreas, and receives the biliary and pancreatic ducts.

The length of the inteſtines is determined uſually according to the nature of the food upon which the bird lives; they are longeſt in the *graminivorous*, and very ſhort in the *accipitres*. Many birds, however, which uſe a mixed food, or even live altogether upon fiſh, have the ſmall inteſtines of great length; this is the caſe with the *heron*, and ſeveral others. The whole of the inteſtines of the *cormorant*, according to the Pariſian anatomiſts, meaſured ſeven feet long; and what is difficult to explain, thoſe of the *buſtard* and *caſſowary*, although large and graminivorous birds, were only four feet in length. The different *oſtriches* diſſected by the Academy, varied materially with reſpect to the length of the inteſtinal canal, one ſubject meaſuring fifty feet, another forty-two, a third thirty-three, and a fourth twenty-nine feet.

There is very little peculiar to be noticed in the ſtructure of the ſmall inteſtines. They are, as in other animals, covered externally by peritoneum, have two layers of muſcular fibres, and their internal ſurface is furniſhed with thoſe innumerable fine vaſcular proceſſes called *villi*. The *graminivo-*

rous

reus birds have commonly the longeſt villi; in the *gooſe* and *ſwan* they are ſingularly beautiful, floating a conſiderable way into the cavity of the inteſtine. The birds of prey, and thoſe which feed on fiſh, have the villi in general ſo ſmall and indiſtinct, that on a ſlight inſpection, the inner ſurface of the inteſtine appears quite ſmooth. The *owl*, however, forms a remarkable exception to this obſervation in having long and pendulous villi.

The vaſcular proceſſes upon the internal ſurface of the ſmall inteſtines of the *oſtrich* do not poſſeſs the uſual villous or hair-like form, but conſiſt of very thin plates, or lamellæ. Theſe are ſhort, with the edges ſomewhat round, and placed not in ſucceſſion, but alternately one with reſpect to another, ſo that each lamella ſtands oppoſite to the interſpace of the two adjoining, by which means the ſurface of the inteſtine puts on very exactly the appearance of twilled cloth. The ſtructure producing this effect cannot be ſeen completely, as may be ſuppoſed, without a magnifying glaſs.

We have not obſerved in birds any thing analogous to thoſe projections of the internal coat of the ſmall inteſtines, which in other animals are called *valvulæ conniventes*. The Academicians, however, relate that they found in the *buſtard* the inner tunic of the ilium folded longitudinally, in the manner of the laſt ſtomach of ruminating animals, and that towards the extremity of this inteſtine there were ſome tranſverſe wrinkles, which ſupplied the place of the valve of the colon.

Throughout the tract of the inteſtinal tube, we have diſcovered ſeveral cluſters of mucous glands: where theſe are ſituated, the internal coat appears as if ſlightly ulcerated, or not unlike a dyſenteric inteſtine, inſtead of that regular dotted figure which the mucous glands commonly exhibit in mammalia.

The *great inteſtines*, as they are called, bear no ſort of proportion to the ſmall, in point of length: in many inſtances, even where the latter are of conſiderable extent, they do not exceed a few inches. They only admit of diviſion into two parts; the cœcal appendages, and the continuation of the tube until it terminates at the anus. The firſt correſpond with the inteſtinum cœcum of mammalia; and the other takes the place of the colon and rectum; but which from its extreme ſhortneſs and direct courſe to the anus, would appear to deſerve only the name of rectum.

The *cœcal appendages* are ſubject to as much variety as perhaps any other part of the ſtructure of birds. Generally, they are two in number; in which caſe, they ariſe rather abruptly from oppoſite ſides of the inteſtinal tube, about the place where the convolutions ceaſe, and the inteſtine becomes ſtraight.

It may be received as a general rule, to which, however, there are ſome ſtriking exceptions, that the magnitude of the cœca is in proportion to the muſcularity of the ſtomach; we accordingly meet with this organ of the greateſt ſize, and the ſtrongeſt characters in the *gallinæ* and other *graminivorous* birds, from which it will be found moſt convenient firſt to take the deſcription.

The cœca in theſe birds commonly aſcend for ſome way quite cloſe to each ſide of the inteſtine, from which they ariſe; during which they are leſs than the other parts of the inteſtinal canal; they then make a ſlight curve outwards, and become ſomewhat enlarged, and towards the ſuperior extremity they again diminiſh before their termination in the cul de ſac. Theſe parts reach up in the abdomen to near the liver, and often make a ſlight curve round the ſpleen; they are connected to each other, and to the inteſtine between them, and alſo retained in their relative ſituation in the abdomen, by reflections of peritoneum, of which ſome are analogous to the meſo-colon and meſo-rectum, and others contribute to the formation of the air-cells. See *Plate* III. in the *Anatomy of Birds*. *Fig.* 3. repreſents thoſe parts in the *pintado*, or *guinea-hen*; *a* the laſt portion of the ſmall inteſtine placed between the two cœca, *b b* the cœca, *c* the rectum, *ddd* the peritoneum connecting thoſe parts, *e* a proceſs of peritoneum paſſing acroſs from the top of one cœcum to another. If the cœca be ſlit open, it is found that they communicate with the rectum by an aperture which is ſmaller than their own cavity at the place; and conſequently, any ſubſtance will paſs with difficulty into them from the other inteſtines, and likewiſe be obſtructed in its return.

Juſt within the entrance of each cœcum, there is a cluſter of mucous glands, which appear like two ſpots of ulceration. Theſe are particularly uſeful in this ſituation to ſmooth the paſſage of ſubſtances in and out of the cœca.

The contracted parts of the cœca are in ſome degree villous on the inner ſurface, and reſemble in ſtructure the reſt of the inteſtinal canal; but the dilated parts are deprived of villi, poſſeſs very little vaſcularity, appear to have few, if any, muſcular fibres, are without mucous glands, and are little better than ſimple membranous tubes. Theſe parts contain the exuviæ of the food.

All the uſes which the cœca ſerve to animals are certainly not yet known; and the functions of theſe organs in birds are amongſt the leaſt underſtood. The magnitude of their cœca is not always in proportion to the apparent neceſſity for ſuch reſervoirs; often, where they might be expected large, they are ſmall, or abſent altogether, and ſometimes, where the nature of the food would not ſeem to need theſe repoſitories, they are of conſiderable ſize. With the view of determining their uſes, they were removed from the living hen, and the conſequence is ſaid to have been, that the animal would not admit any food from the crop into the gizzard, from which it might be inferred, that theſe organs ſerve other and more important purpoſes in the animal economy, than mere reſervoirs of excrement; that, however, they are employed as a ſort of temporary ſewers, to receive the undigeſted parts of the food, is obviouſly true; and that in doing ſo, they anſwer an uſeful purpoſe, appears to be proved, in deſpite of many exceptions, by the more numerous inſtances of their bearing a decided relation to the digeſtive organs, and the quality of the food.

The ſame ſtructure which has been deſcribed in the *guinea hen*, or *pintado*, is to be found with little variation in all the *gallinæ* except the pigeon, and in the *herbivorous anſeres*, ſuch as the *ſwan*, the *gooſe*, &c.

Daudin deſcribes the cœca of the *heath-cock* (*tetrao urogallus*), and of the *white grous* (*tetrao lagopus*), as grooved or fluted longitudinally.

The cœca of the *oſtrich* are different from thoſe of other birds; they are large where they commence, and diminiſh gradually towards their termination; they ſuffer many convolutions in conſequence of a longitudinal band upon the poſterior ſide, which is only two-thirds of their length; they are ſacculated, or divided into loculi, throughout their whole extent, by means of a valvular projection of the internal coat, which winds in a ſpiral manner, ſimilar to the valve of the cœcum in the *hare* and *rabbit* in mammalia, or the *ray* and *ſhark* kind amongſt fiſh.

The ſpiral lamina is about five lines in breadth, but becomes ſomewhat leſs towards the extremities of the cœca. This lamellated ſtructure is continued for ſome way into the other great inteſtine, and even into the ſmall inteſtines; not, however, as one ſpiral valve, but in ſeveral tranſverſe projections, which have a ſemilunar figure, and are placed alternately, ſo that one lamella is received between two others, in the manner of the denticuli of the bivalve ſhells. *Plate* III. *fig.* 4. is a portion of the firſt part of the great inteſtine

or colon of the *oſtrich*, repreſented of the natural ſize and cut acroſs to ſhew the ſemicircular lamina on the inſide.

The effect of this ſtructure is obviouſly the retention of the excrementitious part of the food for a longer time in the cœca; which is accompliſhed in other inſtances by the ſmallneſs of the aperture through which theſe parts communicate with the other inteſtines. This organ is not ſimilar in the other *ſtruthious* birds. According to the Pariſian diſſectors, the *caſſowary* is not provided with any cœcum. In the *caſſowary*, or (with more propriety) *oſtrich*, of New Holland, we have found two cœcal appendages, which opened into the rectum by orifices not much larger than pin-holes. The internal ſurfaces had none of the laminæ, or valvular projections, but were furniſhed with fine vaſcular flocculi, ſimilar to thoſe of the ſmall inteſtines of the *oſtrich*; with this difference, that in the New Holland bird, they are placed longitudinally, and are more looſe and pendulous, looking ſomewhat like lacerated portions or ſhreds of the inner coat of the inteſtine.

In by far the greater number of birds the cœcal appendages are too ſmall to ſerve any purpoſe, and appear only as uſeleſs imitations of the ſtructure deſcribed in the *graminivorous* kinds. Many, that live on a mixed food, and whoſe ſtomachs are of an intermediate ſtrength, amongſt the larger *paſſeres*, the *picæ* of Linnæus, the *grallæ*, and the *anſires*, have two cœca meaſuring in length uſually about twice or thrice the width of the inteſtine from which they take their origin. See *Plate* III. *fig.* 5. which exhibits theſe parts in the *gull*. Cœca of this ſize have hardly any cavity, and ſeldom receive any of the contents of the other inteſtines; in the ſmall *paſſeres*, which feed upon ſeeds, as the *ſparrow* and *finch* tribes, the cœca bear a ſtill leſs proportion to the ſize of the reſt of the inteſtinal canal; ſee *fig.* 6. of *Plate* III. in which the cœca are repreſented as they are commonly found in thoſe birds.

In the *pigeon* the cœcal proceſſes are ſo ſmall, that they eſcaped the notice of ſo accurate an anatomiſt as Severinus, who deſcribed the pigeon as wanting them altogether. *Fig.* 7. of *Plate* III. exhibits their appearance in the *dove*.

The carnivorous birds of all others have the cœca of the ſmalleſt dimenſions; ſo much ſo, in many inſtances, that their exiſtence has been often denied. *Fig.* 8. of *Plate* III. is copied from the Memoirs of the Royal Academy of Paris; it ſhews the ſlight dilatation which was found in the *bald buzzard (falco haliætus*, Linn.) in place of the cœcal proceſſes. On the internal ſide, however, this enlargement was furniſhed with a valvular membrane, by which a pouch was formed on each ſide.

The *owl* appears a very remarkable exception to the common ſtructure of the *accipitres*, which reſpect to the formation of the cœca, which both in figure and magnitude are ſimilar to thoſe parts in the *gallinæ*. It is difficult to account for this ſingularity, unleſs it be ſuppoſed neceſſary to receive the indigeſtible parts of the animals, which this bird ſwallows entire.

Some of the *piſcivorous* birds, as the *heron*, &c. have only one cœcal proceſs; it is very ſhort, and in the *heron* terminates in a pointed manner. See *Plate* III. *fig.* 9.

There are inſtances of the cœcal appendages being altogether wanting. They have not been found in the *caſſowary*, the *cormorant*, the *bittern* (*ardea ſtellaris*), the *parrot*, and the *wood-pecker*.

That portion of the inteſtinal canal which correſponds to the colon and rectum of mammalia, as already obſerved, is very ſhort in birds. In its external characters, it reſembles the reſt of the inteſtinal canal, of which it appears to be ſimply the continuation. The internal ſurface is provided with villi, which, however, are not ſo long and delicate as thoſe of the ſmall inteſtines. They are rather very minute eminences than villous proceſſes, eſpecially towards the termination of the rectum, at which place they often aſſume a decided granular appearance. The inner ſurface of the rectum in the *New Holland oſtrich*, however, preſents an exception to this obſervation; it is covered with fine and truly hair-like proceſſes; in this bird alſo the internal coat of the great inteſtine is ſlightly folded or wrinkled tranſverſely, in a manner ſomewhat ſimilar to the valvulæ conniventes of the ſmall inteſtines of the human ſubject.

The termination of the rectum in birds is very uſually called the *cloaca*, on account of its receiving, as a common ſink or ſewer, both the excrements of the inteſtines and the urine. There is at this place a dilatation of the gut, which is often only a ſlight and gradual enlargement juſt within the margin of the anus; but ſometimes it ſwells out ſuddenly into a pouch or ſack. A remarkable example of which occurs in the parrot; ſee *Plate* IV. in the *Anatomy of Birds*, *fig.* 1. *a* the rectum, *b* the pouch.

The cloaca of the *buſtard* has been found large enough to contain an egg. It is of an oval form; it is ſituated about an inch from the anus, and the rectum again experiences a contraction previous to its termination in the vent. See *fig.* 2. of *Plate* IV. in the *Anatomy of Birds*; *a*, the rectum before it enters the pouch; *bb*, the pouch laid open to expoſe its interior; *c*, the contraction within the anus.

In the *oſtrich*, this dilatation is of great ſize; being capable of receiving one's two fiſts, according to the report both of the anatomiſts of the French academy, and of Mr. Warren, who publiſhed a diſſection of this bird, in the Philoſophical Tranſactions, ſee N° 394. p. 113.

The uſe which the anal pouch anſwers is almoſt too obvious to be mentioned, which is that of a temporary accommodation to the excrements of the bird, by which their ejection is rendered leſs frequent.

The cloaca is furniſhed with ſomewhat ſtronger muſcular fibres than the reſt of the inteſtine, and is inveſted with a reflection of cuticle, which in the larger birds is very palpable. Connected with the cloaca, there is a bag, or purſe, which, taking the name of the anatomiſt who firſt deſcribed it, is called *burſa Fabricii*.

The *purſe of Fabricius* is uſually of an oval or round figure, depreſſed on the anterior and poſterior ſides, and thence always appearing empty. It is furniſhed with a narrow proceſs, or neck, which is moſt contracted about its middle. Its ſituation is on the back part of the cloaca, to which it is cloſely connected, being incloſed in the ſame reflection of peritoneum which envelopes the rectum. When the peritoneum is diſſected off, it is found to be a diſtinct bag or ſack, united only to the rectum by means of its neck, which paſſing obliquely in the coats of the cloaca, opens into the inteſtine by a ſlit-ſhaped aperture. The internal coat of the cloaca projects over the opening like a penthouſe, and performs the office of a valve, readily allowing the contents of the bag to paſs out, but ſtanding in the way of any regurgitation from the inteſtine. See *Plate* IV. of *fig.* 2. and the purſe of Fabricius in the *buſtard* which is of an oblong ſhape in this bird; *c*, the ſlit by which it communicates with the cloaca.

The ſize of this bag is in general fairly proportioned to that of the bird in which it is found. In the *buſtard* it has been ſtated to be two inches long; in the *gooſe*, it meaſures about an inch and a quarter in length, and half an inch in breadth; and in the *ſparrow*, it is about a quarter of an inch long, and half as broad.

The external ſide of the burſa is ſmooth and equal, but the internal part is thrown into deep rugæ. The folds are diſpoſed in an arboreſcent form, and branch off with great regu-

regularity from a ſtem which is lodged in the neck of the bag. See *Plate* IV. *fig.* 3. in which the purſe of the *gooſe* is delineated, with its cavity laid open, to exhibit the folds upon the inner ſurface.

When more cloſely examined, the ſtructure of this part is very curious. Under the peritoneal covering, it is ſurrounded by a very delicate expanſion of muſcle, the fibres of which take a tranſverſe direction. The internal tunic of the purſe is made of a thin pellucid membrane, and the folds which have been deſcribed, conſiſt entirely of glandular bodies, which are too minute to be diſtinguiſhed with the naked eye. By employing a lens of common magnifying powers, we have diſcovered them to bear a great reſemblance to the gaſtric glands, being, like them, little cylinders, which are perforated at one extremity to give paſſage to their ſecreted fluid; indeed, the only difference which appears between them, is, that the glands of the purſe are ſhorter, being ſo much compreſſed in ſome inſtances, that they are nearly of an annular form. *Fig.* 4. of *Plate* IV. exhibits a portion of the burſa of the *gooſe*, highly magnified; *a*, *a*, the glands compoſing the folds; *b*, *b*, the ſpaces left between the folds, which conſiſt only of the tunics of the purſe.

The fluid produced by theſe glands, and of which the purſe always contains a greater or leſs quantity, appears to differ in no reſpect from common mucus. The neceſſity, however, for ſo ample a ſupply of mucus, as theſe glands are capable of furniſhing, does not ſeem very plain, eſpecially when it is conſidered that the purſe of Fabricius is not met with in all birds. Amongſt others, the *parrot* is without it, as appears by *fig.* 1. of *Plate* IV. in the *Anatomy of Birds;* and yet the parrot has a very large cloaca, and might thence be ſuppoſed to need this glandular apparatus, even more than many birds, admitting its uſe to be the ſecretion of a mucous fluid, to ſheath the cloaca againſt the acrimony of the excrement and urine.

Although the functions of the purſe of Fabricius cannot be ſtated with certainty, it may be conjectured that they are not unimportant, from the delicacy of its organization, and its being ſo rarely wanting. There are a number of black points to be ſeen within the anus of the *parrot*, which appear like the orifices of mucous glands: may not theſe ſuperſede the neceſſity of the purſe in this bird?

The *excrements* of birds have been aſcertained by Vauquelin and others, to poſſeſs an acid. This is increaſed by fermentation, into which feculent matters rapidly tend, and as it proceeds, the acid gives place to ammonia, which is evolved, towards the end of the proceſs, in great abundance. The dung of the *pigeon* is found to contain an acid of a peculiar kind, which is increaſed by the mixture of the fæces with water. It is from its chemical properties that the dung of pigeons becomes ſo ſerviceable as a manure, and that it is employed in the proceſs of ſome manufactures, and for domeſtic purpoſes, ſuch as cleanſing clothes, &c.

Vauquelin has alſo analyſed the fixed parts of the excrements of fowls, which being compared with thoſe of the food, afforded ſome very ſingular and important reſults.

For this purpoſe he fed a *hen* for ten days upon oats, of which ſhe conſumed during that time 11,111,843 grains troy weight; theſe contained

136,509 grains of phoſphate of lime,
219,548 ſilica,

356,057.

In the courſe of theſe ten days the hen laid four eggs; the ſhells of which yielded 98,776 grains of phoſphate of lime, and 453,417 grains of carbonate of lime. The whole quantity of excrement ejected during the ten days contained 175,529 grains of phoſphate of lime, 58,494 grains of carbonate of lime, and 185,266 grains of ſilica. The amount, therefore, of the fixed parts diſcharged from the ſyſtem during this period were as follows:

	274,305	grains of phoſphate of lime,
	511,911	grains of carbonate of lime,
	185,266	ſilica,
Given out	971,482	
Taken in	356,057	
Surplus	615,425	

Hence it appears, that the quantity of ſolid matter parted with by the ſyſtem during ten days, exceeded the quantity taken in by 615,425 grains.

The amount of the ſilica received was 219,548 grains,
The quantity given out was only 185,266 grains,

Deficient 34,282 grains.

Conſequently there diſappeared, during ten days, 34,282 grains of ſilica.

The quantity of phoſphate of lime taken in was - - - 136,509 grains,
That given out was - - - 274,305 grains,

137,796

There muſt have been formed, by digeſtion in this fowl, no leſs than 137,796 grains of phoſphate of lime, as well as 511,911 grains of the carbonate of lime. It may thence be preſumed, that lime (and perhaps phoſphorus) is not a ſimple ſubſtance, but compounded of ingredients which exiſt in oats, water, and air, which were the only matters that could be introduced into the body of this fowl; as a quantity of ſilica had diſappeared, it might be ſuppoſed, that it had contributed to the formation of the additional products; but if ſo, it muſt have entered into combination with a great quantity of ſome other ſubſtance. See Annal. de Chim. xxix. 16.

Notwithſtanding theſe experiments were conducted by the ableſt chemiſt of the age, they ought not perhaps to be aſſented to without being repeated under every circumſtance which could lead to the detection of any error that might poſſibly ariſe.

This is not only neceſſary on account of the extraordinary nature of the reſults, which could only be produced by a creative power in the aſſimilating organs of the animal; but from other analogous experiments yielding reſults of a contrary kind. Dr. Fordyce, for inſtance, found that a certain quantity of calcareous matter was required by birds during the period of laying; and if the bird was deprived of this, the ſhell never was formed, and the bird frequently died from the eggs not coming properly forward. The method he adopted to prove this was ſimple and ſatisfactory: he took a number of canary birds, when about to lay; ſome he incloſed, ſo that they could have no acceſs to any calcareous matter; and to others he gave a piece of old mortar, which they ſwallowed with avidity, and they laid their eggs as uſual; whilſt, on the other hand, thoſe birds he had not furniſhed with the mortar were unable to produce eggs, and in ſeveral inſtances died. See Fordyce on Digeſtion, p. 25 & 26.

Liver.

This viſcus is ſituated about the middle of the common cavity of birds. Its form, as in other animals, is much influenced by the ſhape of the parts which are immediately adjacent. The left ſide lies on the ſtomach, the right covers the

the inteſtines, and the apex of the heart is accommodated in the middle, and wherever the liver comes into contact with theſe parts, it receives in a degree an impreſſion of their form.

Vic d'Azir, in his great ſyſtem of anatomy, ſays, that the liver of birds is divided into only two lobes; and Cuvier has repeated the aſſertion in his Tableau Elementaire de l'Hiſtoire Naturelle. The obſervation, nevertheleſs, is not in all caſes ſtrictly true. In many birds there is a third lobe, ſituated at the back of the liver, between the right and left lobes: this appears to be analogous to the lobulus ſpigelii of the human ſubject, both from its moſt uſual figure, and from its poſition. See *Plate* IV. of the *Anatomy of Birds*. *Fig.* 5. repreſents the liver, &c. of the *gooſe* reviewed on the poſterior or reverſe ſide; *a* the right lobe reaching lower down than the other, and exhibiting impreſſions correſponding to the convolutions of the inteſtines; *b* the left lobe, with two prominent parts, and a depreſſion extending along the lobe between them; *c* the third, or intermediate lobe. In the *common fowl*, the left lobe is cleft on the anterior part ſo deeply as almoſt to form two lobes on the left ſide. The French academicians allow three lobes to the liver of the *cormorant*; they are all very ſmall. A third lobe has been deſcribed alſo in the *pigeon* by Borrichius, and in the *ſwan* by Bartholine. The liver of the *oſtrich* conſiſts of four imperfect lobes.

There is conſiderable variety in the ſhape and relative ſize of the two principal lobes; generally the right lobe much exceeds the other in bulk, and is ſomewhat longer. This character of the lobes is to be ſeen in the liver of the *gooſe*, *Plate* IV. *fig.* 5. but is more remarkable in the *caſſowary*, and even ſtill more ſo in the *buſtard*, in which the right lobe deſcends to the bottom of the belly; both lobes are ſhort in the *eagle*, the *Indian cock*, the *parrot*, the *owl*, and many others; and in the *eagle* the left lobe has the greater bulk.

The two lobes are nearly of equal ſize in the *heron* kind, and both long-ſhaped. However much the livers of birds may differ in external forms, the internal ſtructure is the ſame in all caſes, as we have proved by numerous obſervations. The ſecretory veſſel is produced from the veins of the neighbouring viſcera, as in mammalia, and after entering the liver by the depreſſion or fiſſure on the lower ſurface, which correſponds to the *portæ* or *gates* of the human liver, it is diſtributed throughout the ſubſtance of the organ, and terminates in the ſame manner as the *vena portæ*, i. e. in fine radii, or penicilli towards the ſurface of the liver.

As there is no muſcular ſeptum between the thorax and abdomen of birds, their liver has not the advantage of that mode of connection, which is called in mammalia the coronary ligament: it is however amply ſupplied by the duplicature of peritoneum, which correſponds to the falciform ligament; this proceſs divides the two principal lobes, paſſing deeply between them; it is connected to the peritoneum, which forms the air cells, in the ſides and back part of the abdomen, is incorporated with the pericardium, and joins the ſternum and the linea alba on the fore part of the abdomen, and then becomes reflected on each ſide of the common cavity, which is thus divided almoſt for its whole extent, in the ſame manner as the mediaſtinum divides the thorax in mammalia. The extended attachment, which is in this way procured for the liver, renders this viſcus more ſteady in its ſituation than it is in other animals, which birds require on account of the rapid and violent motions of their bodies during the act of flying. As the falciform ligament goes on to the fore part of the cavity, the margin which forms the round ligament is neceſſarily wanting, but the remains of the umbilical vein may be traced running between the duplicature of the peritoneum.

The *gall-bag*, or reſervoir of the ſecreted fluid of the liver, in almoſt every inſtance where it exiſts, is ſituated upon the lower ſurface of the right lobe, ſomewhat nearer its central than its external edge. It is commonly received into a ſlight depreſſion of the liver, ſo that about one-half of the bag is brought into contact with that viſcus, nothing being interpoſed between them but the connecting cellular ſubſtance. The ſurface of attachment is occaſionally leſs extenſive; thus in the *eagle*, *buſtard*, and *cormorant*, the bag ſtands out from the liver being only united to it by one end.

The form of this bag is commonly that of an egg, or a globe, or often ſomething between theſe two figures. In a few inſtances it is elongated, as in the *buſtard* and *caſſowary*; it meaſured in the latter bird only one inch in diameter, although it is ſeven inches in length.

The ſtructure of the *gall-bag* appears to differ in no reſpect from that deſcribed in mammalia; its coats diſcover no trace of muſcular fibres, and its internal ſurface exhibits the ſame kind of reticulation or net-work which is found in the gall-bladder of the human ſubject. See *Plate* IV. and *fig.* 5. in the *Anatomy of Birds*; the letter *d* indicates the gall-bag of the *gooſe* viewed particularly in its natural poſition; the reticulated ſtructure is viſible on the outſide, but to bring it more perfectly into view the cavity is expoſed by the removal of a portion of the bag.

The bile does not flow into the gall-bag by regurgitation from the common duct, but is conveyed directly thither by means of a particular tube deſigned for that purpoſe. This duct ariſes from the right lobe, paſſes on the ſide of the bag, which is in contact with the liver, then becomes involved in the coats of the cyſt, which it perforates about the diſtance of one-third from the poſterior end.

The orifice by which the duct opens into the cavity of the bag, is very ſmall, and is ſurrounded by a ſmooth projection of the inner membrane, which added to the obliquity of the duct, affords the effect of a valve, and entirely prevents any return of the fluid upon the liver; for the more the cyſt is diſtended, the more preſſure will be laid upon the duct, in its paſſage.

It would ſeem that the cyſto-hepatic duct is ſituated nearly in the ſame way in all birds, where it exiſts, but the preſent deſcription is taken from the *gooſe*. See *Plate* IV. and *fig.* 5. in which *e* points out the termination of the duct in the gall-bag, upon the papilla above-mentioned, and the courſe of the duct alſo is to be indiſtinctly ſeen behind the tunics of the cyſt.

The *ducts* which carry the bile to the inteſtines, are two in number, the *hepatic* and the *cyſtic*. The firſt ariſes by two branches, generally from the right and left lobes of the liver, and while within the fiſſure or portæ of the liver, they unite to form the trunk which proceeds to its inſertion in the inteſtine, and uſually croſſes the duct of the gall-bag in its way thither.

The *cyſtic duct* comes forth abruptly from the moſt poſterior part of the gall-bag, which is not prolonged into a neck, as in other animals. The duct makes a turn round the end of the bag, along the ſide of which it then proceeds ſo cloſely applied, that upon a ſlight examination it might be ſuppoſed to commence from that part, or even from the anterior end of the cyſt.

The cyſtic and hepatic ducts never unite to form the ductus communis, as in many animals; but proceed diſtinctly to the inteſtine, into which they always enter ſeparately; ſometimes very near each other, and at others removed to a little diſtance. Two hepatic ducts have been found

found in the *Indian cock* or *curassow*, which also had a distinct insertion in the intestine.

The part of the intestines where the biliary ducts penetrate, is commonly at the conclusion of the first doubling or convolution, which occurs after the origin of the intestine from the stomach; or, in other words, it might be said to be at the termination of the duodenum. The bile duct of the *ostrich* is very large and enters the intestine near the stomach.

As in mammalia, the passage of the ducts through the coats of the duodenum is somewhat oblique, and they open upon a papilla or prominence of the internal coat, thus gaining the effect of a valve, and preventing the regurgitation of their fluid. In addition to which, the *bustard* is described as having a fold of the inner coat of the intestine projecting over the orifices of the biliary and pancreatic ducts.

Plate IV. and *fig.* 5. in the *Anatomy of Birds*, exhibits the origin, course, and termination of the biliary ducts in the *goose*; *f* the hepatic duct, formed of two branches in the fissure of the liver: *g* the origin of the cystic duct from the end of the bag, appearing internally like a puckered hole; *h* its course behind the hepatic duct, beyond which it terminates in the intestine; *i i* the first convolution of the intestine; *k* the portion from which the gizzard has been cut away; *l* the commencement of the second fold of the intestines, or the beginning of the jejunum.

Both the cystic and hepatic ducts of the *gull* become slightly enlarged just at their insertion in the intestine, which is produced not so much from a dilatation of their cavity as a thickening of their coats. The more minute structure and the functions of the bile ducts are in every respect analogous most probably to those of the same parts in other animals. A very curious observation has been made on this subject by Borrichius, which deserves to be mentioned. He opened a pigeon while yet alive, and discovered in the hepatic duct a pulsatory motion, by which it was alternately distended and emptied of its contents, the intervals between each contraction were somewhat longer than they occur between the systole and diastole of the heart. If this had been related by a less accurate anatomist than Borrichius, one would be led to suspect that a blood-vessel had been mistaken for the biliary duct; but he watched the moment that the action of the heart subsided, and still the duct was alternately emptied and distended with a green fluid as before.

The gall-bag is occasionally wanting in birds, and it should be remarked, that this irregularity is not governed by any general rules of structure, as two species which agree in every other respect, are observed to differ in this; nay, according to the French academicians, the gall-bag is not constantly found even amongst the individuals of the same species; thus in dissecting six *demoiselles of Numidia* (*ardea virgo*), it was absent in two of them, and the others had it very small. Amongst ten *pintados*, also, they only met with the gall-bag twice, and differing very much both in size and shape; and in these instances where the bag was absent the hepatic duct was found very large.

The species known to be deprived of the gall-bag, are the *ostrich*, the *parrot*, the *pigeon*, the *bittern*, the *crane*, and the *cuckow*; in some of these, dilatations of the ducts have been observed which may be supposed to supply in a degree the office of the gall-bag, which appears from this, as well as other circumstances, to be simply a reservoir for the bile, and not an organ for working any change in the properties of that fluid. Being, therefore, a convenient, rather than a necessary structure, its absence need not be expected to be marked with any clear relation to the other functions of the animal economy.

No experiments have yet been instituted with the design of procuring a chemical analysis of the bile of birds; it is most probable, however, that these would discover nothing peculiar, as in sensible properties, such as colour, taste, &c. it perfectly resembles the bile of mammalia.

The Pancreas

Consists of two distinct glands, for the most part, in birds. Their common situation is between the coil of the first intestines, to which they are very firmly bound by their peritoneal coat; they have a very elongated figure, furnished with decided sides, angles and edges, which are irregularly notched or indented. These clefts mark out imperfectly the original lobules of which the glands are composed. They appear to possess the same internal structure which is described in mammalia, though not so palpably as to be discovered without some pains; to a slight observation their substance seems to be a white homogeneous mass, instead of that congeries of lobules, cells, blood-vessels, and ducts, which really enter into its composition. Each of the glands produces a principal duct, which separately runs in the reflection of peritoneum, into which intestine they are inserted, at a variable distance from each other, in the manner of the two biliary ducts. Their entrance is, with scarce an exception, adjacent to that of the bile ducts, and often so near that one projection of the internal coat of the intestine serves for the termination of all the ducts.

See *Plate* IV. in the *Anatomy of Birds*, in *fig.* 5. the letters *m m* indicate the two pancreatic glands of the *goose*, a little separated from each other, and their other peritoneal connections, to exhibit more clearly their figure; *n n* the ducts from each gently curved in their passage to the intestine. The pancreatic and biliary ducts are at a considerable distance in the *ostrich* and the *gull*. In the first, as already mentioned, the hepatic duct enters the intestine near the stomach; but the pancreatic duct passes as usual into the last portion of the duodenum. The pancreatic ducts of the *gull* penetrate the duodenum at its commencement, whilst the biliary preserve nearly the common situation. It is not very unusual for these ducts to enter the intestine alternately, or for the two pancreatic to pass between the two biliary; this may be observed in the *eagle*, the *heron*, &c.

Considerable varieties have been described in the number, external figure, and magnitude, &c. of the pancreas in different birds. The French academicians have represented it as a single gland, with only one duct in the *ostrich* and *cassowary*. In the latter it was extremely small in proportion to the size of the bird, being only two inches long, and its duct a line and a half in length. In the *eagle* it appeared to be single, although in one instance it sent forth two ducts, and in another three; it was enlarged and round at the head, at which place it was perforated by the hepatic duct in its way to the intestine. They also describe that this gland varies in different individuals of the same species; thus in one *curassow* they found the pancreas double, and in another single. De Graef in most *fowl* found three pancreatic ducts, and also in the *pigeon*, and Bartholin observed only one pancreatic duct in the *peacock*.

The Spleen

Has been described as occupying different situations by different authors. Thus Cuvier, and other anatomists, have stated its common position to be the middle of the mesentery. The French academicians found it closely adhering to the side of the ventricle, in one species of eagle (*falco chrysaëtos*) and in another (*falco haliaëtos*), it was met with under the right lobe of the liver; and Severinus mentions the spleen of the *crow* being situated upon the first intestine. In every bird, however, which we have examined with the view of

ascertaining the situation of the spleen, it has been uniformly discovered underneath the left lobe of the liver, placed a good deal backwards, and on the right side of the zone of gastric glands. Its peritoneal connections to the neighbouring parts are loose and permit it to be displaced, when the other viscera are removed from their situations, which circumstance may have occasioned some difference in the observations made upon the subject. The situation we have described is the most convenient for its being supplied with blood, which it receives from the gastric artery, and is besides consistent with general analogy.

The figure of the spleen is most commonly round; it is, however, in some birds, a little different in form. The most usual deviation is the oval or kidney shape, which has been observed in the *cormorant*, the *eagle*, the *pintado*, the *common fowl*, &c. In the *ostrich* it is cylindrical, and in the *cassowary* it has been likened in figure to a soal fish. In the *gull* it is much elongated and pointed at both ends, as it is shewn in *Plate* IV. in the *Anatomy of Birds*, and *fig.* 6.

The spleen assumes rather an irregular form in the *goose;* it is slightly compressed and round on the one side, and flat on the other. The outline presented on either side is triangular, and one of the angles is prolonged as a mamillary process, which is distinguished from the rest of the spleen by a slight cleft or fissure. This is represented in *fig.* 7. of *Plate* IV. of the *Anatomy of Birds; a* the body of the spleen viewed on the flat surface; *b* the papilla-shaped process; *c* the entrance of the splenic artery, upon the edge; *d* the vein penetrating the flat surface.

The texture of the spleen is so much more close and firm in birds than in mammalia, that one might be easily led to suppose its structure was different; but when prepared by being injected with coloured substances, and submitted to examination through a lens, we have discovered, as in mammalia, the splenic artery to terminate in numerous minute branches, and the veins to take their rise from cells. The only difference which exists, is with respect to the magnitude of the cells which are extremely minute; and thence arise the peculiar compactness and density of the spleen of birds.

The structure of this organ being so very similar to that of the spleen in mammalia, it is fair to conclude that their functions are also analogous. The situation of the viscus in birds might be considered, therefore, as affording an objection to that theory, which supposes this organ was designed to regulate the quantity of blood employed by the arteries of the stomach during the secretion of the gastric fluid; for, in birds, the spleen receives no pressure as occurs in mammalia by the introduction of food into the stomach, and consequently, cannot affect the distribution of the blood in the collateral arteries, more under the circumstance of a full stomach than an empty one. In order to put the spleen of birds in the same conditions to which it is subject in man and quadrupeds, it should be placed under the crop in the graminivorous tribe, or between the ventricle and the ribs in the other kinds.

Although it would be often wrong to determine the uses of an organ in one class of animals, from the circumstances in which it may be placed in another; yet no theory can be considered as well founded, unless it be framed in the contemplation of all the varieties of comparative structure.

Absorbents.

One of the most remarkable and inexplicable circumstances in the anatomy of birds is, that the nutritious fluid of the intestines, or the chyle, is as transparent as the lymph which is taken up from the common interstices, or the surface of the body. The absorbents of the intestines, therefore, do not deserve to be called *lacteals*, an appellation they have received in man and quadrupeds, in consequence of the opacity and milky appearance of their contents.

The discovery of the lymphatic system in birds may be reckoned amongst the modern improvements in anatomy. Before Mr. Hunter, about the middle of the last century, described the absorbents of the neck, it was generally supposed that the office of these vessels was fulfilled in birds by the minute branches of veins. This opinion was rendered the more probable as several able anatomists had sought in vain for those white vessels, and their glands, which are so easily detected in the mesentery of the smallest quadruped. It was not then known, however, that the lymphatic vessels of the intestines were always pellucid in birds, and unprovided with glands, and accordingly Mr. Hunter's discovery was not generally admitted as decisive on the question, until some years afterwards the whole of the lymphatic system had been described by Mr. Hewson; he employed for this purpose a young and very lean goose, which had been recently fed, and having secured it upon a table, he opened the abdomen whilst the bird was yet alive, and passing a ligature round its mesenteric vessels, as near to the root of the mesentery as possible, the lymphatics of this part became apparent in a few minutes. The same method also was pursued to expose the absorbents of the neck. A ligature was placed round the jugular vein at the lower part of the neck; and to be more certain of inclosing the lymphatics which are near it, a sufficient quantity of the surrounding substance was included by the ligature. It this way he succeeded in tracing the lymphatic system, in more instances than one, after having filled the vessels with quicksilver. He published a description of the absorbents, illustrated by two drawings, in the Philosophical Transactions for the year 1748, and in his Experimental Inquiries into the lymphatic system.

As no accounts or figures of the absorbents of birds have been offered to the public since Mr. Hewson's time, we cannot do better than adopt the description, and copy the representation left to us by that indefatigable anatomist; in doing which, we shall transcribe his own words.

" This system consists in birds, as it does in the human " subject, of three parts, viz. the lacteals, the lymphatic " vessels, and their common trunk, the thoracic duct. The " lacteals indeed, in their strictest sense, are in birds, " the lymphatics of the intestines, and like the other lym- " phatics, carry only a transparent lymph; and instead of " one thoracic duct there are two, which go to the two " jugular veins. In these circumstances, it would seem, " that birds differ from the human subject, so far at least " as I may judge from the dissection of a goose, which was " the bird I chose as most proper for this inquiry, and from " which I took the following description, after previously " injecting its lymphatic system with quicksilver.

" The lacteals run from the intestines upon the mesenteric " vessels. Those of the duodenum pass by the side of the " pancreas, and probably receive its lymphatics: afterwards " they get upon the cœliac artery. Whilst they are upon " this artery they are joined by lymphatics from the liver. " Here they form a plexus which surrounds the cœliac " artery: at this part they receive a lymphatic from the " gizzard; and a little farther, another from the lower " part of the œsophagus (or zone of gastric glands). Hav- " ing now got to the root of the cœliac artery, they are " joined by the lymphatics from the glandulæ renales, or " renal capsules; and near the same part, by the lacteals " from the other small intestines, which vessels accompany

"the mesenteric artery. These last mentioned lacteals, "before they join those from the duodenum, receive from "the rectum a lymphatic, which runs with the blood-vessels "of that gut. Into this lymphatic some small branches "from the kidneys seem to enter, which, coming from "those glands upon the mesentery of the rectum, at last "open into its lymphatics. At the root of the cœliac "artery, the lymphatics of the lower extremities probably "join those from the intestines. The former," he says, "I "have not yet traced to their termination, though I have "distinctly seen them on the blood-vessels of the thigh; "and in one subject which I injected, some vessels were "filled, contrary to the course of the lymph, from the net-"work near the root of the cœliac artery. These vessels "ran behind the cava, and down upon the aorta, near "to the origin of the crural arteries; and I presume they "were the trunks of those branches which I had seen in the "thigh. At the root of the cœliac artery, and upon the "contiguous part of the aorta, a net-work is formed by "the lacteals and lymphatics above-described. This net-"work consists of three or four transverse branches, which "make a communication between those which are lateral. "In the subject from which this description was taken "there were four. From this net-work arise the two "thoracic ducts, of which one lies on each side of the spine, "and runs upon the lungs obliquely up towards the jugular "vein, into which it opens, not indeed into the angle be-"tween the jugular and subclavian vein, as in the human "subject, but into the inside of the jugular vein, nearly "opposite to the angle. The thoracic duct of the left side "is joined by a large lymphatic which runs upon the œso-"phagus, and can be traced as far as the lower or glan-"dular part of that canal, from which part, or from the "gizzard, it seems to issue. The thoracic ducts are joined "by the lymphatics of the neck (and probably by those of "the wings), just where they open into the jugular veins.

"The lymphatics of the neck generally consist of two "pretty large branches on each side of the neck, accom-"panying the blood-vessels. Those two branches join near "the lower part of the neck; and the trunk is in general "as small, if not smaller, than either of the branches. "This trunk runs close to the jugular vein, gets on its in-"side, and then opens into a lymphatic gland. From the "opposite side of this gland a lymphatic comes out, which "pours the lymph into the jugular vein. On the left side, "the whole of this lymphatic joins the thoracic duct of the "same side; but, on the right, one part of it goes into the "inside of the jugular vein a little above the angle, whilst "another joins the thoracic duct, and with that duct, forms "a common trunk, which opens into the inside of the ju-"gular vein, a little below the angle which that vein makes "with the subclavian.

"To this description it may be necessary to add, that "though it be taken from one subject, yet in three others "of the same species, which I examined carefully, I saw "nothing which disagreed with it. I particularly attended "to the number of the thoracic ducts, suspecting that "possibly in this subject the two that I had seen might be "only a variety, which is a circumstance that, as we are "told, has occurred even in the human body. But in "three others of this species, which I likewise successfully "injected, I still saw two ducts; and therefore I am in-"clined to believe, that this is the constant number. I "likewise carefully attended to the vessels coming from the "gland on the right side; and in the only two subjects in "which the lymphatics of the neck were properly filled, "I observed that one part of it opened immediately into "the vein, and the other joined the thoracic duct. In all "the four subjects I evidently saw that the thoracic ducts "opened into the inside of the jugular veins.

"This system in birds differs most from that of quad-"rupeds, 1st, In the chyle being transparent and colour-"less; 2dly, In there being no visible lymphatic glands, "neither in the course of the lacteals, nor in that of the "lymphatics of the abdomen, nor near the thoracic ducts; "3dly, In the several parts of this system in birds being "more frequently enlarged, or varicose, than in quadrupeds. "In particular, this appears to be the case of the vessels "which constitute the net-work at the root of the cœliac "artery, in that subject from which the drawing was taken. "The lacteals are frequently enlarged in some places; so "are the thoracic ducts; and the lymphatics on each side "of the neck are commonly, when taken together, larger "than their trunk, which opens into the lymphatic gland. "In one subject, when, instead of two lymphatics on the "left side, I found only one, that vessel was as large as a "crow quill, whilst the lower part of it, which entered the "gland, was much smaller."

The figures which explain the foregoing description are to be found in *Plate* V. of the *Anatomy of Birds*. *Fig.* 1. shews the absorbents in their natural situation, with respect to the other parts of the body; A, the neck; B, B, the clavicle divided near its middle; C, the left subclavian artery; D, D, the jugular veins; E, E, the pulmonary arteries; F, F, the two branches of the trachea; G, G, the lungs; H, the aorta; I, the cœliac artery; L, the œsophagus turned to one side; M, M, the renal capsules; N, a small part of the liver fixed to a rib by a thread; O, O, O, intestines; P, the duodenum; Q, the pancreas fixed to a rib by a thread; R, the gizzard. *Fig.* 2. exhibits the absorbents, and their more immediate connexions with the vessels, in outlines: *a*, the lacteals, or more properly lymphatics, which come from the *duodenum*; *b*, the lymphatics of the liver, N; *c*, *c*, a plexus formed by the above-mentioned lacteals and lymphatics, which surrounds the cœliac artery, I; *d*, a lymphatic from the gizzard; *e*, a lymphatic from the lower part of the *œsophagus*; *f*, *f*, a net-work formed by the lymphatics upon the *aorta*, H; *g*, *g*, the two thoracic ducts; *i*, *i*, the trunks of the lymphatics of the neck; *k*, *k*, the glands through which the lymphatic vessels of the neck pass: that of the left side is oblong, and could not well be represented in a Figure; *l*, the thoracic duct of the left side, and the lymphatic vessel of the neck, opening together into the inside of the jugular vein; *m*, a part of the lymphatic of the right side of the neck, opening into the jugular vein, D; *n*, the thoracic duct of the right side, joined by a part of the lymphatic vessel of the right side, and then opening into the inside of the jugular vein.

Heart.

This organ occupies the centre of the superior portion of the common cavity of birds. It is placed usually in the line of the body, as in quadrupeds; the heart, however, is inclined in the slightest degree to the left side in some instances, and in others a little to the right side. The apex of the heart is commonly received between the two chief lobes of the liver, which are hollowed out for its accommodation.

The membranous bag, which contains the heart, is formed like the pericardium of other animals, and is reflected in the common manner upon the origin of the great vessels, and the heart. The pericardium of birds is generally considerably larger than the heart, and especially at the lower part, which

which is often prolonged for ſome way between the lobes of the liver. It deſerves remark, that notwithſtanding the great ſize of the pericardium, the air, which pervades almoſt all the cavities of birds, is not admitted into this. The Pariſian academicians, it is true, obſerved the pericardium to ſwell when they inflated the lungs and air-cells of the *pintado*, and thence concluded that the air had admiſſion to the heart, for which they aſſigned ſome curious reaſons; ſuch as the heart requiring compreſſion and evaporation from its ſurface. They appear, however, to have been equally in error with reſpect to the fact and the reaſoning; for, in a great number of ſpecies we have examined for the purpoſe, the pericardium was uniformly found to contain a certain quantity of water, and had not the leaſt communication with either the lungs or air-cells. The Pariſian anatomiſts muſt have been led into this miſtake by the diſtenſion of the air-cells around the pericardium.

The heart is of a longer figure in birds than in other animals; and the outline of the right ſide is ſlightly concave, in conſequence of the parietes of the right ventricle being relatively thin. In the *oſtrich*, the heart has been deſcribed as nearly round; meaſuring ſix inches from the baſe to the apex, and five inches acroſs.

Birds have, like mammalia, four diſtinct cavities in the heart, which bear the uſual proportions in magnitude with reſpect to each other. The auricles however, and eſpecially the right, are commonly more muſcular than in other animals; and the left ventricle is always much ſtronger than the right.

The internal ſurface of the auricles is very irregular, in conſequence of the ſhape and ſize of the muſcular faſciculi. There is one very ſtrong portion of muſcle, which enters into the compoſition of the auricular part of both cavities, from which other faſciculi proceed in a regular and radiated manner, at leaſt in the right auricle. See *Plate* V. in the *Anatomy of Birds*. *Fig.* 3. ſhews the heart of the *gooſe*, with the auricle and ventricle of the right ſide laid open, *e* the principal muſcular faſciculus of the auricular portion of the cavity paſſing backwards towards the left auricle; *f* the leſſer faſciculi, which depart from the other as branches from a trunk; *g g* the deep foſſæ which exiſt on each ſide of the large faſciculus.

The blood of the viſcera and lower limbs is conveyed into the right auricle by a vein correſponding to the inferior vena cava of mammalia. There is, however, no vein ſtrictly analogous to the ſuperior cava, the veins of the right wing and that ſide of the head and neck, form a diſtinct trunk, which enters the upper part of the auricle; while thoſe of the oppoſite ſide alſo produce another trunk, which paſſes along the poſterior ſurface of the left auricle, to which it is cloſely united, and opens into the right auricle beſide the inferior cava.

The anatomiſts of the French academy obſerved, in moſt of the birds they diſſected, a valvular projection of the inner membrane of the heart, over the entrance of the inferior vena cava into the right auricle. This valve reſembles in form that of the coronary vein of the human heart, and by its means, the orifice of the cava, which is really very large, puts on the appearance of a narrow ſlit. A ſimilar valve hangs over the entrance of the veins which return the blood of the wings and head to the auricle. See *Plate* V. in the *Anatomy of Birds*, *fig.* 3. *a a a* point out the veins, which terminate in the right auricle with their valvular orifices, into each of which a briſtle has been introduced.

The analogy between the valves of the veins entering the right auricle of birds, and the Euſtachian valve of the human heart, is very obvious, and demonſtrates, as far as analogous ſtructure can, that the latter ſerves the purpoſe of a valve to the vena cava in the human ſubject.

There are commonly two or three orifices for the coronary veins in birds, one is always larger than the reſt, and tranſmits the blood of the principal vein of the heart. They are each provided with a ſlight projection of the inner membrane, which acts imperfectly as a valve.

The right ventricle is of a triangular figure, and is quite ſmooth on the internal ſurface; there being none of thoſe proceſſes of muſcle which are called *carneæ columnæ*.

The valve, which is placed at the mouth of the right ventricle, is of a peculiar ſhape and ſtructure in birds. Inſtead of thoſe thin and membranous folds, which uſually ſurround the orifice of the ventricle, and are moved by means of their connexion with the carneæ columnæ, and which from their figure in the human ſubject are called the *tricuſpid valve*; there is a ſingle projection of the fleſh of the heart, of a triangular figure, and nearly as thick as the parietes of the cavity in which it is contained. The triangular valve is joined by its ſuperior edge to the margin of the orifice of the ventricle, and is united by another of its edges to the right ſide of the cavity almoſt to the bottom. The third edge is unconnected, except by a ſmall proceſs, which goes off near one of the ſuperior angles to the parietes of the ventricle on the left ſide. See *Plate* V. in the *Anatomy of Birds*, *fig.* 3. *b* the triangular valve, expoſed by means of the anterior parietes of the right ventricle being cut off, a briſtle is paſſed under the valve from the auricle; *d d d* the external ſurface of the heart; *c* the proceſs connecting the floating edge of the valve to the parietes of the ventricle, with a briſtle lying under it.

The triangular valve, from its thickneſs and muſcularity, would ſeem to operate chiefly by means of the contraction of its own fibres changing its figure, and thus obſtructing the return of the blood into the auricle. Borrichius diſcovered a foramen in the ſeptum of the heart of the *pigeon*, large enough to admit a briſtle, by which the two ventricles had a direct communication with each other. See Act. Dan. anni 1. obſerv. 96.; and we have obſerved the ſame foramen at the upper part of the ſeptum of the heart of the *gooſe* in one inſtance; it was of ſufficient ſize to receive a crow quill. Such a communication does not appear, however, to be an uniform or natural ſtructure, as we failed to diſcover it in other *geeſe*, and in different ſpecies of birds examined for the purpoſe. Indeed, a ready communication between the ventricles of an adult bird, would be inconſiſtent with the mode in which the functions of reſpiration and circulation are carried on in this claſs of animals.

The pulmonary artery is provided with three ſemicircular valves, as in mammalia. It divides alſo, as uſual, into a veſſel for each lung, and that of the right ſide paſſes under the arch of the deſcending aorta.

The blood is returned from the lungs by two pulmonary veins, which open very near each other into the upper and poſterior part of the left auricle.

The mechaniſm of the cavities of the left ſide of the heart more nearly reſembles that which exiſts in mammalia. The ſinus, or membranous part of the left auricle, is however very ſmall, and of an oblong ſhape; and at the place where the pulmonary veins enter into the auricle, there appears to be a projection of the internal membrane, which performs the office of a valve to their orifices.

The valve of the left ventricle is thin and membranous, and reſembles ſo much the *mitral* valve of the human heart, that the ſame name might with propriety be given to it.

The

The tendinous cords, however, which are attached to the margins of the valve, are not moved by diſtinct muſcular faſciculi, or *carneæ columnæ*, but proceed immediately to be loſt in the ſides of the ventricle. The lower part of the cavity is faſciculated, although not ſo remarkably as the internal ſurface of the ventricle of man or quadrupeds.

The aortic or ſemicircular valves are to be found at the origin of the great arterial trunk from the left ventricle.

The above account of the mechaniſm of the heart of birds ſhews that this organ is calculated to exerciſe its functions preciſely in the ſame manner in theſe animals as in mammalia; and that the pulmonary and general circulations are maintained by different chambers of the heart; conſequently every particle of blood is expoſed to the influence of the air in the lungs, previous to its diſtribution throughout the ſyſtem for the purpoſes of nutrition, excretion, &c. Before the deſcription of the veſſels of general circulation is entered upon, it is in order therefore to treat of the organs of reſpiration, or the

Lungs.

Theſe bodies are ſituated on each ſide of the dorſal ſpine, upon the ſurface of the ribs and intercoſtal ſpaces, uſually reaching in length from the ſecond rib to the laſt intercoſtal ſpace but one, and extending in breadth from the ſpine to about that part of the ribs, where the proceſſes are ſent from one to the other. In the *oſtrich*, the lungs were found to meaſure ten inches long, and three and an half broad, and were one inch and an half in thickneſs.

The lungs of birds never move from their poſition, as they adhere to the inſide of the cheſt, and are covered over by a ſtrong membrane or aponeuroſis.

They are ſmooth and even on the anterior part; but their figure poſteriorly exactly correſponds with that of the parts upon which they are laid. The ribs and intercoſtal ſpaces ſerve as a mould, of which the lungs are the perfect caſt, preſenting a remarkable projection for each depreſſion between the ribs. Theſe eminences are of courſe moſt ſtriking next the ſpine; and towards the anterior edge of the lungs, which is very thin, they are ſcarcely viſible.

The lungs have two coverings; one is ſomewhat analogous to the *pleura*, though not exactly ſimilar to it in ſtructure, being more like condenſed cellular ſubſtance. It cloſely inveſts each lung, and appears to be flocculent on ſome parts of its ſurface, and to adhere to the parietes of the cheſts. The other coat is common to both lungs; it is extended from each ſide of the cheſt to the dorſal ſpine acroſs the anterior ſurface of the lungs. It is connected in a degree to the fore-part of the ſpine, and incloſes at this place the trunk of the deſcending aorta, ſuffering the cœliac artery to paſs through it. It has no intimate union with the proper tunic of the lungs except at the openings of the air-cells, and around the entrance of the great veſſels of the lung. The texture of this coat appears to be tendinous; its fibres all run in the tranſverſe direction; and in large birds they are evidently white. This aponeuroſis is not equally ſtrong upon every part of the lungs; at the upper part, and eſpecially above where the veſſels enter, it is ſo weak as often to be hardly viſible.

In all birds there would appear to be ſome muſcular fibres paſſing from the ſide of the cheſt upon the aponeuroſis of the lungs. Theſe are very diſtinctly to be ſeen in the larger ſpecies, in ſome of which the muſcles of the lungs are of conſiderable ſtrength. The anatomiſts of the French academy obſerved ſix ſtrong ſlips of muſcle on each ſide of the body in the *oſtrich* and *caſſowary*. They aroſe from the ribs which come from the ſpine, near their junction with thoſe which belong to the ſternum, and terminated in the aponeuroſis which covered the lungs. Mr. Ramby diſcovered eight muſcular faſciculi to each lung of the *oſtrich*. See Phil. Tranſ. N° 386. p. 223. We have noticed only four broad thin ſlips of muſcle in the *goſe*, which proceed from the articulation of as many vertebral ribs with the ſternal; in the common *fowl*, the muſcles of the lungs do not preſent the appearance of diſtinct ſlips, as in other inſtances, but are ſpread as a ſingle layer upon each lung.

It is difficult to ſpeak with certainty of the uſes of the pulmonary muſcles. The effect of their contraction appears to be the tenſion of the aponeuroſis, and conſequently the elevation of it into a flat ſurface which is ordinarily concave or depreſſed. This would neceſſarily produce ſome dilatation of the lungs; and therefore theſe muſcles might be reckoned amongſt the agents of inſpiration, although their operation in this way would be very trifling.

The Pariſian anatomiſts attributed ſeveral uſes to them; they ſuppoſed that theſe muſcles had the power of depreſſing the anterior part of the thorax, in conſequence of their attachment to the moveable angle of the ribs, and their oblique courſe upward to the ſpine. If they be allowed to perform this effect, they muſt be conſidered as muſcles of expiration.

They imagined alſo that they cauſed, when in action, a conſtriction of the foramina through which the air is admitted into the great air-cells of the thorax or upper part of the body, and thus enabled the bird to maintain a continued diſtenſion of theſe cells, in order to diminiſh the ſpecific gravity of its body during the time it remained on wing; or (what the academicians thought more probable) furniſhed the bird with a ſupply of common air to carry with it into the regions of the atmoſphere, in which the air would be too thin and light for reſpiration; in the laſt conjecture, however, they ſeem to have forgotten the effect that the temperature of the bird's body would produce in the rarefaction of the air contained in the cells.

When the lungs of birds are ſtripped of their coverings, they are ſtill found to be a connected, uniform ſubſtance, and not reducible into lobes or lobules as in mammalia; they appear, to a ſuperficial view, ſolid and fleſhy, but if examined more clearly, are ſeen to be made up of the ramifications of the great blood-veſſels, the bronchiæ, and very minute air-cells.

When the bronchiæ enter the lungs, their chief branches, inſtead of being regularly and equally diſtributed, paſs directly to certain points upon the ſurface of the lungs, and there terminate in ſeveral foramina, which communicate with the great air-cells of the body; theſe branches alſo of the bronchiæ retain in their ſtructure, almoſt throughout their extent, ſome cartilaginous rings. The ramifications of the air tube which really ſupply the ſubſtance of the lungs, are but branches of thoſe which go to the cells. They are comparatively ſmall, and entirely compoſed of membranes. This ſtructure accounts for the fleſhy appearance and ſolid feel of the lungs, and explains why birds are able to fill their air-cells with ſo much eaſe and rapidity.

Air-Cells.

Although phyſiologiſts are not agreed with reſpect to the uſes which theſe parts ſerve in birds, yet as they are immediately connected with the lungs, it ſeems moſt proper to deſcribe them in this place. It is one of the moſt remarkable and peculiar circumſtances in the anatomy of birds, that the atmoſpheric air has a ready paſſage to almoſt every part of the interior of their bodies.

The air-cells, according to their ſituation, may be divided

into three kinds. 1. Thofe of the great cavity of their body which takes the place of the thorax and abdomen. 2. Thofe fituated amongft the mufcles; and laftly, thofe in the interior of their bones.

It has been already ftated, that the body of birds is not divided into two parts by a tranfverfe mufcular partition or diaphragm. This common cavity is interfected by a great number of membranes, fome of which fimply enclofe the feveral vifcera, but the greater number form cells, which are filled from openings upon the furface of the lungs.

Thefe membranes are in moft birds extremely fine and delicate, often fo much fo, that the vifcera are perfectly vifible through them; they are almoft impoffible to be diffected unlefs when kept continually inflated, by blowing into the trachea; it is faid, however, that in the *oftrich* and *caffowary*, they are as ftrong as a hog's bladder.

The anatomifts of the academy defcribe the heart and liver of the *oftrich* as contained in one cavity, which was unfurnifhed with air, and was feparated from the air-cells on the fide by two longitudinal membranes, and from the ftomach and inteftines below, by a tranfverfe membrane, fituated like the diaphragm of mammalia, and covered on its inferior furface by a layer of fat, of the thicknefs of a finger; in all the birds, however, which we have examined, we have found a membrane inclofing the pericardium, in the manner of the mediaftinum, and afterwards reflected upon the liver, and then forming two facks, of which one contained the left lobe of the liver, and the other included the left lobe, along with the anterior furface of the gizzard; and in the *goofe*, and fome other birds, the membranous fack of the left fide of the liver only admitted into it the upper half of the anterior part of the gizzard; in general, no air is found in the cells which enclofe the liver and the anterior part of the gizzard; we, however, once inflated them from the trachea in the *goofe*, in which they had a communication with the cells of the abdomen, by means of three large holes; but it is probable, that this was from mal-conformation of the membrane.

The *air-cells of the great cavity* of birds, according to the academicians, who take their defcription from the *oftrich* and the *caffowary*, are five on each fide of the body. The four fuperior cells are immediately next the aponeurofis of the lungs, and are feparated from the reft of the cavity by a ftrong membrane which defcends from the top of the thorax upon each fide to be joined to the tranfverfe membrane which divides the heart and liver from the ftomach and inteftines. The inferior cells are by much the largeft, and are kept diftinct from the inteftines by a ftrong membrane, fimilar to the other partitions of the cavity; they come in contact with the aponeurofis of the lungs, only at their fuperior part, where they receive their air. The uppermoft cell is the fmalleft, and derives its air from an opening at the fuperior part of the lungs. The next cell is of a fquare figure, and is filled by means of two foramina fituated upon the external edge of the lungs. The third cell of each fide is not a regular fquare, being of greater extent where it joins the lungs than at the oppofite; it has but one communication with the bronchia, which is placed upon the internal margin of the lungs. The fourth cell is of a very irregular elongated form, reaching down to the bones of the pelvis; it is lefs extenfive in the *caffowary* than in other birds. The air-hole of this cell is fituated at the loweft part of the lungs. The laft or inferior cells are long, and fomewhat of an oval fhape; they communicate with the moft inferior point of the lungs.

The Parifian anatomifts defcribe all thefe cells as being formed of diftinct tunics, fo that each is a feparate bag, inftead of being made by continuous and reflected membranes. They repreffent the bags to be diftinct alfo from the great membranous partitions of the cavity. See *Plate* V. in the *Anatomy of Birds; fig.* 4. is copied from the memoirs of the French academy, and exhibits the air-cells, &c. of the *oftrich; a* the trachea; *b b* the two bronchiæ paffing to the lungs; *c* the heart; and *d d* the liver, feen in the fuperior divifion of the cavity; *e* the tranfverfe membrane which feparates, like the diaphragm, the common cavity into two parts; *f* the ftomach; and *ggg* the convolutions of the inteftine, feen in the lower or abdominal portion of the cavity; *hhhh* the lateral partitions which inclofe the four fuperior cells; 1 2 3 4 5 indicate the different cells; the air-holes are apparent in each, except the inferior or abdominal cells, which cannot be brought into view, as they lie behind the fourth cells.

The air-cells of birds in general do not exactly accord with the defcription given of the *oftrich* and *caffowary*, by the members of the Royal Academy; we fhall therefore proceed to give an account of what we have obferved on this part of the anatomy of birds in the *goofe*, *duck*, *common fowl*, *pigeon*, &c.; and in order to make this defcription more intelligible, we fhall take the liberty of naming the cells according to their fituation with refpect to other parts, although fome of the terms muft be adopted upon the ftrength of analogy, as the diftinctions of thorax and abdomen do not with ftrictnefs belong to birds.

The firft is the *fuperior thoracic*, or *jugular air-cell*. When it is diftended with air, it becomes evident upon the outfide of the thorax, between the two branches of the fork; it is large enough in the *goofe* to contain an apple in its anterior part, and poftериorly it extends on each fide of the bafis of the heart, over the lungs. This cell contains the divifions of the trachea into the bronchiæ and the trunks and primary branches of the blood-veffels which fupply the wings and head. A great number of membranous fepta pafs through it in various directions, which ferve to connect and keep fteady the different veffels, and alfo divide this cell into feveral chambers, which, however, have all a free communication with each other. The air is tranfmitted from the fuperior part of each lung by two openings which are placed in the poftерior chambers of this cell. Thefe chambers do not appear to extend fo far upon the lungs in other birds as they do in the *goofe*; it is from this cell that the air paffes into the cells of the axilla, and under the fork-fhaped bone, into the deep feated cells of the neck, and to thofe about the fhoulder.

The next cells may be called the *intermediate thoracic*. They are generally two in number, one to each fide; they lie immediately upon the lungs, and are in a degree covered by the anterior thoracic cell. That of the right fide is ufually larger than the one on the left; the latter is particularly fmall in the *goofe*, being almoft concealed by the two adjoining cells, and extending under the poftерior part of the liver. The cell of the right fide is of an oblong fquare figure, and is prolonged under the termination of the inferior vena cava in the right auricle, as far as the left fide of the bulbus glandulofus. The intermediate thoracic cells receive their air through a large foramen, fituated upon the inner edge of each lung, juft at the bafis of the heart. At the upper and inner angle of thefe cells alfo there is an opening which appears to lead to fome fmall cells under the pericardium and œfophagus, and to communicate indirectly with the anterior thoracic cell.

The

The *lateral thoracic cells* are amongſt the largeſt of the body. They are of a pyramidal figure, their baſis being applied to the intermediate thoracic cells, and their point reaching as far down as the bones of the pelvis; they cover the inferior portion of the lungs, and occupy a ſpace between the ribs and the lobes of the liver. They have a very free communication with the branches of the bronchiæ, at the external edge of the lungs.

As the intermediate thoracic cells are ſmall on the left, and large on the right ſide, theſe cells are larger on the left ſide than on the right: this diſproportion is moſt obſervable in the *gooſe*, and very trifling in the *duck*, in which the two intermediate thoracic cells are nearly of an equal magnitude.

The air-cells, which are found in the lower or abdominal portion of the cavity of birds, are compoſed of thinner membranes than the others; in ſome parts they are ſo tender, that they are ruptured with the ſlighteſt touch, from which they become very difficult to examine.

Underneath the lateral thoracic cells, at the very loweſt part of the lungs, on each ſide of the ſpine, the branches of the bronchiæ open into the cavity of the abdomen, by which means air is conveyed directly into the two great *lateral abdominal cells*, and from theſe it would appear that it paſſes into the others.

The *lateral abdominal cell* of the right ſide is by much the largeſt in the body; it reaches from the laſt ribs to the anus, and lies over and includes almoſt all the ſmall inteſtines, the renal capſule, and the kidney. It appears in the *gooſe* to be divided from the oppoſite cell by a membrane which paſſes obliquely from the right ſide of the anus to the lower part of the gizzard.

The *left lateral abdominal cell* contains the inteſtines of that ſide; it is attached to the margin of the gizzard, under which it is prolonged as far as the lungs, where it is ſupplied with air, as already mentioned.

The lateral abdominal cells tranſmit air to the inguinal cells, and to ſeveral chambers formed by the moſt delicate membrane, amongſt the inteſtines. One of theſe being ſomewhat ſtronger than the others, there was an opportunity of obſerving it more diſtinctly. It makes a circuit around the right ſide of the gizzard to which it is attached, and incloſes the duodenum and pancreas; it might thence receive the name of the *duodenal cell*.

Interpoſed between the parietes of the belly and the lateral cells there is frequently found a conſiderable quantity of tender fat; eſpecially in aquatic birds, ſuch as the *gooſe*, &c. By this means a ſoft cuſhion is provided for the ſmall inteſtines to preſs and move upon, thus ſupplying the uſe of the *omentum*, which is a part not met with in birds.

The ſtructure of the air-cells of birds in general does not appear to be the ſame deſcribed in the *oſtrich* and *caſſowary* by the academicians. The membranes compoſing them, inſtead of being diſtinct bags, as they relate, reſemble rather the pleura or the peritoneum, and like them, ſeem to produce all the different cavities by the means of reflection. It muſt be confeſſed, however, that the membranes of the cells, eſpecially in the abdomen, are very eaſily ſeparable into different lamina, or layers, which, it might be ſuppoſed, could be ultimately reſolved into diſtinct ſacks.

It deſerves to be mentioned, that each of the air-holes in the ſurface of the lungs opens obliquely into the air-cells; there being a ſlight projection of thin membrane over the aperture. The Pariſian anatomiſts aſcribed a valvular effect to this ſtructure, which they ſuppoſed of great conſequence, as it would ſerve to continue the diſtenſion of the air-bags, after they were once inflated. The projection of the membrane over the air-holes does not however appear to be ſufficient to cauſe any obſtruction to the regreſs of the air from the cells; nor would it ſeem neceſſary or convenient to interrupt in the leaſt degree the expulſion of the air contained in the cells.

The membranes of which the air-cells are compoſed, are reflected into the apertures of the air-holes, and are there perforated by a great number of ſmall foramina, which correſpond to the termination of the ramification of the bronchiæ, through which the air has a ready paſſage. When theſe foramina are brought into view, by diſſecting of the coverings of the lungs, they give the anterior ſurface an appearance of being pricked by pins.

The air-cells which are found amongſt the muſcles and integuments of the external parts of the body, vary in number and magnitude, according to the ſtructure and economy of the bird. In every inſtance, perhaps, the anterior thoracic or jugular cell is continued along with the veſſels and nerves into the axilla, making what may be called an *axillary cell*, and in moſt birds others go off from this anteriorly under the pectoral muſcle, and backwards under the muſcles of the ſcapula, forming *pectoral* and *ſubſcapular cells*. In the *eagle*, *hawk*, *ſtork*, *lark*, and other high flying birds, theſe cells are very large, and in many of thoſe birds there are ſtill larger cells, aſcending under the integuments of the neck, and paſſing beneath the ſkin of the inſide of the arm, and the back of the ſhoulder. In the *ſtork* we found theſe cells large enough to admit the finger to paſs a conſiderable way down upon the inſide and the back of the wing. They are alſo large in the *owl* and other birds of prey.

Moſt birds of flight have a number of cells placed under the lateral muſcles of the neck. Theſe are oppoſite to the bodies of the cervical vertebræ, and communicate with one another. It is from the different cells about the axilla and neck, that the bones of the ſhoulder, the humerus, and the vertebræ, receive the air which they contain.

The *inguinal* and *gluteal cells* are filled from the great lateral cells of the abdomen, with which they have a communication, where the blood veſſels of the lower extremities paſs out of the pelvis. The inguinal and gluteal cells ſurround the neck of the femur; they are in moſt birds very ſmall, but in thoſe which are much employed in flight, eſpecially if the thigh bones receive air, they are larger, extending for ſome way amongſt the muſcles behind the joint. Camper obſerved two air bags between the glutæi muſcles of the genus *ſpoonbill* (*p'ataka*), although no air was tranſmitted into the femur.

The ſubcutaneous air-cells of the *pelican* are very large, and were deſcribed long ago by Mery, in the early Memoirs of the Academy of Sciences of Paris.

Several means have been employed to prove that the air is permitted to enter the cavity of the bones in birds. The air-cells and the lungs have been inflated from the bones, and injection being thrown into the trachea, was found, after diſtending the air-cells, to have paſſed into the interior of the bones. A ſtill more deciſive experiment (although a cruel one) is to cut the humerus acroſs in a living bird, and introduce the extremity of the divided bone into water, in which ſome ſoap has been diſſolved, when it is perceived that bubbles are produced by the exit of the air from the end of the bone. This expedient not only aſcertains the exiſtence of air in the bone, but ſhews that there is a motion or circulation of it, which is the effect of the actions of inſpiration and expiration.

This ſubject has been very extenſively inveſtigated by Camper;

per; he discovered the communications between the cavities of the bones and the air-cells of the soft parts, and ascertained in a great number of species what bones were filled with air.

The result of both his observations and our own tends to shew, that the bones of birds are supplied with air, according as they are employed in the locomotion of the animal's body. In birds of flight, therefore, almost all the bones are hollow, and receive air; thus in the *eagle* Camper found the air-cells communicated with the thigh bones, those of the pelvis and coxyx, all the vertebræ, the sternum, clavicles, scapulæ, and fork-shaped bone, and the bones of the wing. The air was also admitted into the bones of the head from the cavity of the tympanum. We have observed the bones in the *hawk* and *stork* to want marrow in the same manner as those of the eagle. Most of the bones are hollow in the *owl*; but the os femoris is filled with marrow. The *pigeon* kind in general also have no air in their thigh bones, although the *crown pigeon* has been observed by Camper to possess it.

Birds even of moderate powers of flight, receive some air into the sternum and other bones of the trunk, and between the plates of their cranium; and all birds, whose wings are not incapable of flight, have the humerus filled with air, with the exception of the *woodcock*, which has been observed to possess marrow in the humerus; but to counterbalance this impediment to the velocity of its motion, it is provided with pectoral muscles of unusual strength.

Those birds which are unable to transport themselves for any distance by the effort of their wings, are deprived of air in the humerus; of these may be instanced all the *struthious* kind, the *penguin*, the *puffin*, &c. It is worthy of remark, however, that the *struthious* birds, which run with great rapidity, have most of their other bones hollow; Camper discovered the air to pass into the thigh bones and lower jaw of the *ostrich*, and we have observed that it fills not only these bones, but the sternum, the ribs, the vertebræ, and the bones of the pelvis, in both the common *ostrich* and that from New Holland.

The internal surfaces of those bones which contain air have been described by Camper as being in some cases lined with periosteum, and in others entirely deprived of it; thus he states the internal part of the femur of the *eagle* to be cancellated and furnished with a periosteum, upon which several blood-vessels are ramified, and the humerus of the same bird to be a simple osseous tube, without membrane, vessels, or cancelli. It appears to us, however, that the membranes of which the air-cells are composed, are continued in every instance into the interior of the bone, to which they may serve, it is true, the purpose of a periosteum, although in structure they are much more fine and delicate, and when these membranes cease to be vascular, they become dry, and adhere so closely to the surface of the bone, that they are not easily perceived.

The internal parts of the bones of birds which are filled with air consist of cells, like those of other animals; the only difference that can be observed is, that the cancellated structure is less close, and that the tube of the cylindrical bodies, such as the humerus and femur, is larger than usual.

It has been already mentioned, that the bones derive their air in general from those cells which are placed next them amongst the muscles. Some, however, are filled immediately from the lungs, or the large internal air-cells, and the bones of the head and jaws have communications with the Eustachian tube, the cavity of the tympanum, and the sinuses of the nose.

The humerus is supplied with air by the axillary cell, by means of an opening situated at the inner and back part of the head of the bone. See *Plate* VI. in the *Anatomy of Birds*; *fig.* 1. represents the superior half of the humerus of the *American turkey* (*meleagris*); *a* the air-hole, which like the air-holes of the lungs does not open immediately into the cavity of the bone, but contains a number of smaller foramina, that are produced by the cancelli, and have a direct communication with the internal part of the humerus.

The fork-shaped bone is filled from the jugular air-cell, from which also the superior dorsal, and the lowest cervical vertebræ, receive some air, through several small holes scattered upon their lateral and anterior parts. The air-hole of the fork is placed upon the side of its scapular extremity, next the spine. See *Plate* VI. in the *Anatomy of Birds*; *fig.* 2. is the one half of the fork-shaped bone of the *stork* viewed upon the inside, *a* the air-hole.

The clavicle appears to obtain its chief supply of air from the cells which are continued from the jugular air-cells backwards upon the shoulder joint.

The principal foramen is found on the inside of the clavicle, where that bone is connected to the branch of the fork. There are, besides this, some very minute holes upon the outside of the clavicle, immediately above the shoulder joint; and on each side of the sternal extremity of the bone, there is a hole large enough to admit a bristle. See *Plate* VI. in the *Anatomy of Birds*. *Fig.* 3. shews an internal view of the clavicle of the *stork*; *a*, the larger air-hole at the joint of the shoulder; *b*, one of the small foramina which opens into the chest containing a bristle.

The scapula derives air also from the process of the jugular cell behind the joint. It is transmitted through several holes upon the very extremity of the bone. See *fig.* 4. of *Plate* VI. of the *Anatomy of Birds*, *a* the air-holes.

We have discovered the openings by which the air is conveyed into the sternum, to be exceedingly numerous. The principal foramina are situated all along the middle line of the bone, upon the internal surface, which appears reticulated, or made of cancelli. Towards the anterior part there is one hole much larger than any of the rest; and in addition to those of the middle of the bone there are many others passing into the edges of the sternum to which the ribs are articulated. All these foramina would appear to communicate with the thoracic cells. See *Plate*. VI. in the *Anatomy of Birds*; *fig.* 5. exhibits the internal surface of the sternum of the *stork*; *aaa* the small foramina in the middle of the bone, *b* the principal air-hole near the top of the sternum, *cccc* many little foramina seen between the sternal ribs which lead to the lateral parts of the bone.

The vertebræ of the back seem to procure air immediately from the lungs; the foramina are numerous, and placed along the sides of the bodies of the vertebræ and at the roots of their transverse processes. The foramina which conduct the air into the cervical vertebræ, occur with as little regularity; the three first have their largest holes upon the sides of their bodies, and in the rest they are to be found within the canal of the transverse process for lodging the vertebral artery, and along the course of the spinal canal, at least so they have appeared in the *stork*. See *Plate* VI. in the *Anatomy of Birds*. *Fig.* 6. shews one of the cervical vertebræ of that bird, *a* the body of the bone, *b* the spinous process, *cc* the transverse processes forming a portion of the vertebral canal, on the inside of which are perceived several foramina leading into the substance of the bone, *d* the tube behind the body of the vertebra for containing the spinal marrow, exhibiting many small holes upon its internal

nal ſurface. The foramina of the cervical vertebræ have communication with the lateral air-cells of the neck.

The air-holes of the anterior ribs are placed upon the ends of theſe bones, where they are joined to the ſternum. They are ſupplied from the intermediate and lateral thoracic air-cells. See *Plate* VI. in the *Anatomy of Birds*, *fig.* 5. *dddd* refer to the opening upon the ſternal ribs.

The air paſſes into the poſterior or vertebral ribs by a number of foramina, ſituated upon the internal ſurface of their extremities next the ſpine. Theſe foramina appear to have from their ſituation a direct communication with the poſterior ſurface of the lungs. See *Plate* VI. in the *Anatomy of Birds*. *Fig.* 7. is a vertebral rib of the *ſtork* ſeen upon its inner ſide, *a* the proceſs which articulates with the bodies of the dorſal vertebræ, *b* the part joined to the tranſverſe proceſſes, *c c* the ſeveral air-holes.

The air-holes of the bones of the pelvis are ſo numerous, and occur with ſo much irregularity, that they do not admit of a particular deſcription. They are all ſituated upon the internal ſurface of the bones, and appear to be confined to that ſpace covered by the kidnies, under which the air muſt inſinuate itſelf from the abdominal cells, in order to reach them.

The paſſage of the air into the femur of the *eagle* and *ſtork* is through an opening upon the fore part of the bone, juſt within the proceſs correſponding to the great trochanter. It is a round depreſſion, under the edge of which the apertures leading to the cavity of the bone are ſituated. See *Plate* VI. and *fig.* 8. of the *Anatomy of Birds*, which repreſents the femur of the *eagle* ſeen upon the anterior ſide; *a* the air hole, *bb* the cavity of the bone laid open, exhibiting a number of oſſeous proceſſes, paſſing in all directions, dividing the bone on the inſide into many irregular cells; theſe are moſt numerous towards the extremities of the femur, and are hardly to be ſeen in the centre; *c* an artery diſtributing its branches to the membrane which lines the internal part of the bone. The air-hole of the femur in theſe birds communicates with the gluteal cells.

In the *ſtruthious* birds the air-holes of the femur are placed upon the poſterior part, and are found upon both the upper and lower portions of the bone. See *Plate* VI. in the *Anatomy of Birds*. *Fig.* 9. ſhews the poſterior ſurface of the femur of a *young oſtrich*; *a* a depreſſion on the upper part of the bone, containing a number of air-holes, *b* the inferior depreſſion with only three foramina.

The air-holes of the lower jaw have been obſerved in the *African* and *New Holland oſtrich*, the *ſtork*, the *luceros naſutus* and *luceros rhinoceros*, and the *crow*; and in all theſe they conſiſt of two holes ſituated upon the two extremities of the jaw behind the articulation. See *Plate* VI. in the *Anatomy of Birds*. *Fig.* 10. is the lower jaw of the *crow*; *aa* the two air-holes. Theſe foramina communicate by a tube with the cavity of the ear.

The air does not penetrate the bones of the head and jaws in *water-fowls*.

Having deſcribed the diſtribution of air, which takes place throughout the bodies of birds, it remains to aſſign an uſe to this moſt curious and peculiar circumſtance in their anatomy. It has been already ſtated, that the opinions of anatomiſts upon this ſubject are different. The members of the French academy ſuppoſed that the air-cells were neceſſary to carry on the actions of reſpiration in birds. Camper thought that air was admitted into the bodies of birds for the purpoſe of diminiſhing their gravity in relation to their bulk, and thus facilitate their motions; while Mr. Hunter, the greateſt phyſiologiſt of this or any other country, felt unwilling to confine the functions of the air-cells to any one purpoſe, and ſuſpected they might be uſeful in giving tone and ſtrength to the ſong of birds.

The obſervations of the academicians appear to us perfectly ſatisfactory with reſpect to the connection between the exiſtence of the air-cells, and the office of the lungs. They have related, that during the act of inſpiration the ſternum was elevated, and the thoracic air-cells diſtended at the ſame moment with the lungs, and that when the air was expelled from the lungs and thoracic cells, by the depreſſion of the ſternum, one portion of it was expired by the trachea in the uſual way, and the reſt was urged into the cells of the abdomen, the two parts of the cavity thus becoming alternately enlarged and diminiſhed. In order to aſcertain with the more certainty the condition of the air-cells during reſpiration, the academicians ſubjected ſeveral large birds, ſuch as the *turkey*, *gooſe*, &c. to the experiment of having the parietes of the belly diſſected off without injuring the air-cells, while the animal was ſtill alive, by which they had an opportunity of obſerving, that the air-cells below the ſternum were rendered tenſe during the time the thorax was diminiſhed for expiration, and that as ſoon as the ſternum was raiſed to increaſe the capacity of the thorax, the abdominal air-bags become flaccid. We have made an experiment of a ſimilar kind, with the ſame reſult; the abdomen of a living *gooſe* was laid open, from which no air proceeded during inſpiration, but while the air was diſcharged from the lungs, it paſſed into the abdominal cells and through the opening of the belly with ſo much force as to blow out a candle. The neceſſity of having the cavity filled with air in birds, obviouſly ariſes from the circumſtance of the lungs being confined to the poſterior part of the thorax, and conſequently not capable of ſuffering any compreſſion from the contraction of the cheſt, but by the interpoſition of ſome other parts.

Many have ſuppoſed that the air-cells were not only mechanically ſubſervient to the actions of reſpiration, but anſwered another important purpoſe by collecting a quantity of air, which in repaſſing the lungs effected a further change upon the blood, thus producing a ſort of double reſpiration; but the free communication which exiſts between the lungs and the cells, renders it probable that the air on its return paſſes directly by the air-holes into the branches of the bronchiæ, and, conſequently, is never brought into contact with the blood. It would therefore appear that the only part the cells perform in the proceſs of reſpiration is to ſupply an elaſtic medium, by means of which the motion of the ſternum and ribs, equally and regularly affect every part of the lungs.

The air-cells making part of the mechaniſm of the organs of reſpiration, does not preclude them from anſwering other purpoſes in the animal economy. It is plain to demonſtration that the bodies of birds loſe much of their relative weight by containing air in their cavities, and ſtill more from its admiſſion into the external parts and the bones; the advantages of which in tranſporting themſelves through ſo light a medium as the air, or even in locomotion upon a ſolid ſurface, are too obvious to be inſiſted upon.

The air, while it remains in the body, neceſſarily acquires the temperature of the living bird, which renders it much lighter even than atmoſpheric air, and therefore it acts like that contained in the ſwimming-bladder of fiſhes.

A compariſon of the ſtructure of one bird with another proves that the quantity of air is in proportion to the rapidity and continuance of the animal's motion, all other circumſtances being the ſame; and that the air is diſtributed always in preference to thoſe members which are moſt employed in locomotion, as has been already pointed out.

It might be offered in objection to this opinion of the use of the air-cells in birds, that the *bat*, which is an animal very remarkable for the velocity of its flight, and its long continuance on the wing, is unfurnished with any apparatus except its lungs for containing air. The answer to this, however, is very easy; the extent of the wing of the *bat* is singularly large for the animal, and its membranous structure enables it to give impulse to a larger volume of air than could be produced by a wing composed of feathers, even of an equal extent; and further, the pectoral muscles of the *bat* are larger in proportion to the animal than they are found in any species of birds, even those of the highest flight; so that the structure of the *bat*, instead of proving any objection to the uses assigned to the air-cells in birds, affords the strongest confirmation of the theory.

Notwithstanding the respect which is due to every physiological opinion of Mr. Hunter, we cannot perceive that there is the least relation between the air-cells and the organs of voice in birds. With a view of determining this, we have compared the structure of different birds, and have not found the air-cells larger in singing birds, than others. The *nightingale*, so eminent for its loud and protracted notes, is formed, with respect to the air-cells, exactly like the *common sparrow*.

Animal Heat.

Although it is not yet proved that the vital temperature of animals is the result of that process which is called respiration; yet, as it is generally supposed to be so, it would appear most proper to notice the animal heat of birds, immediately after the description of the lungs and their appendages. It is remarkable, that birds possess a higher standard of vital temperature than all other animals. Camper states it to vary from 104 to 107 degrees of Fahrenheit's scale. Mr. Hunter found the rectum of the common *fowl* to be 103, 103½, and 104 degrees; and in a young *goose*, we observed the thermometer to stand at 103 degrees in the rectum, and when inserted into the cavity of the body, to rise and remain at 104 degrees. It is difficult to explain either the cause or the necessity of the high temperature of birds. It has been accounted for by their respiration being more perfect from the air passing twice through their lungs; but even supposing this would alter their degree of animal heat, the occasion does not seem to exist, as birds have not that double respiration which is supposed, as has been already shewn.

It is to be presumed, that the warmth of birds may depend in a degree, upon the structure of their skin, and the nature of their coverings, which are not designed to admit of much evaporation from the surface of their bodies; but it can hardly be supposed, that this, of itself, would be sufficient to produce a temperature so much higher than is found in other animals, and maintain it so uniformly and permanently as it exists throughout the whole class of birds.

No experiments have yet been made to determine the powers which birds possess of resisting the influence of external temperature; but it is to be inferred from analogy, that they can sustain greater extremes of both heat and cold than other animals, without suffering an alteration in their proper degree of temperature; but that, at the same time, birds would soonest yield to dissolution upon any material change in their natural standard, it being found that animals generally enjoy independence of temperature, in proportion as it exceeds that to which they are commonly exposed, and that the higher their natural standard, the more inconvenience arises from any alteration of it.

Blood Vessels.

The organs of circulation in birds have obtained but little of the attention of comparative anatomists. The larger branches of the arteries and veins, which lie near some of the viscera, have alone received any description: and that rather from being involved in the account of other parts, than for their own sake. The distribution of the blood vessels of birds, notwithstanding this, is not the least interesting part of their anatomy, as will appear from the ensuing description, which has been taken chiefly from the *swan*, *goose*, *duck*, *stork*, and *common fowl*, in which it was found so much alike, that it may be presumed the same arrangement of the blood vessels prevails with little variety in all birds.

The Arteries

Proceed from a single trunk which arises from the left ventricle of the heart. This trunk is so short, that it is concealed by the other parts on the basis of the heart, and is only brought into view after the reflections of the pericardium, and the adjoining vessels are detached by dissection. It is from thence, that as the parts are commonly beheld, there appear to be three great arteries issuing together from the middle of the heart, which are the primary branches into which the aorta is divided. The first branch is to the left side, and after it is sent off, the trunk affects to turn over the auricle, before it gives the branch of the right side; these two branches pass in a curved manner from the heart towards the axillæ, in the form of horns, and each is analogous to the *arteria innominata* of the human subject, so that instead of one, there may be reckoned two *arteriæ innominatæ* in birds. After these branches are parted with, the arterial trunk is continued over the auricles, and on reaching the back part of the heart, becomes the *descending aorta*.

The *arteria innominata* first sends off the common trunk of the carotid and vertebral arteries, which before its division gives off one or two small branches; one of these runs down upon the lungs in company with the par vagum, and appears to supply branches to the aponeurosis of the lungs, and the air-cells at the upper part of the thorax; the other branch, after supplying the lymphatic gland of the neck with several small arteries, ascends upon the side of the œsophagus, to which, and the inferior larynx, the divisions of the trachea, and to the parts and integuments of the side of the neck, its branches are distributed, anastomosing with the superior œsophageal and tracheal arteries. This branch is often not sent off until the trunk divides into the vertebral and carotid, in which case it comes from the latter artery. Sometimes in the *duck*, the *supra-scapular* artery, which is usually derived from the vertebral, is a branch of the common trunk.

The *carotid* artery, after parting from the vertebral, proceeds to the middle of the neck, and soon disappears; being covered by the muscles of the anterior part of the neck, under which it lies hidden, and in close contact with its fellow of the other side, to very near the head. If, during its course in this situation, it gives any branches, they are too insignificant to be noticed.

The carotid artery emerges from between the muscles of the neck, at about the third or fourth vertebra from the head; and after giving a branch downwards, amongst the lateral muscles of the neck, it runs along the outer edge of the rectus major anticus muscle, to behind the angle of the jaw, where it divides into its several branches.

An artery first goes off posteriorly, which passes a little forwards under the branch of the os hyoides, and after sending

ing ſome blood to the muſcles of the neck, makes a turn backwards, enters the foramen in the tranſverſe proceſs of the ſecond vertebra, and terminates by a ſingular anaſtomoſis in the vertebral artery.

The next branch is analogous to the *internal carotid*; it goes forward alſo under the os hyoides, and paſſes behind the muſcles of the jaws cloſe upon the lower part of the ſkull, at which place it ſends a branch upwards, which appears to penetrate the bones on the outſide of the ear, and ſupply the organ of hearing, ſend a branch into the ſkull, and another through the articulation of the jaw, to unite with the ophthalmic, and contribute to the plexus at the back of the orbit. The internal carotid then enters an oſſeous canal, which runs along the baſis of the cranium, between the tables of the bone, and at the lower and back part of the orbit, the artery receives a remarkable anaſtomoſing branch of the internal maxillary, which almoſt equals in ſize the carotid itſelf; and theſe two veſſels produce by their union, one, which paſſes almoſt directly into the cranium at the uſual place for the entrance of the carotid artery. This veſſel forms within the ſkull an anaſtomoſis ſimilar to the circle of Willis; but the branch which occupies the place of the *baſilary artery*, is very ſmall, and appears to be furniſhed entirely from the anaſtomoſis of the carotids, and deſigned only to ſupply the medulla oblongata and ſpinal marrow. The branches of the internal carotid are thickly ſpread in an arboreſcent form upon the ſurfaces of the brain; ſome on the outſide, and others on the internal ſuperficies of the ventricles, and the fiſſure between the two hemiſpheres. The carotid alſo, as uſual, ſends off the *ophthalmic* artery, which, beſides ſupplying the eye and the parts in the orbit, produces ſeveral inoſculations with the branches of the external carotid, which will be noticed hereafter. After the trunk of the carotid has parted with the two branches juſt deſcribed, it paſſes for a little way downwards and forwards behind the angle of the jaw, and divides at once into different branches, correſponding to thoſe of the external carotid in mammalia, the firſt of which might be called the *œſophageal* or *laryngeal* artery. This veſſel ſends a branch to the muſcles upon the horn of the os hyoides, and then turns downwards and divides into two branches, one to the trachea, and the other to the œſophagus, upon the ſide of which parts they deſcend to near the thorax, where they inoſculate with the tracheal and œſophageal branches of the common trunk of the carotid and vertebral arteries.

The *external maxillary artery* dips in between the pterygoid muſcle, and that which is ſituated at the back of the lower jaw for opening the mouth; it then paſſes behind the articular bone, and gives twigs upwards to the muſcles of the jaws, and to the plexus at the back of the orbit: upon emerging from behind the articular bone, it lies under the zygomatic proceſs of the jaw, and ſends an artery upwards, which is diſtributed to the temporal and maſſeter muſcles; and proceeding under the triangular tendon that comes from the inferior margin of the orbit to the lower jaw, it divides into two principal branches: one of theſe paſſes along the ſide of the upper jaw, gives a branch upwards to the fore part of the orbit which unites with the ophthalmic artery, and is loſt at the top of the head. This branch is very large in birds with combs, as in conjunction with the ophthalmic, it furniſhes numerous veſſels to theſe vaſcular parts. The artery then goes on and ſupplies branches to the ſides of the head before the orbits, and to the integuments and ſubſtance of the upper mandible, inoſculating with the palatine branches of the internal maxillary artery. The ſecond portion of the external maxillary proceeds to the lower jaw, to which, and the lower part of the maſſeter muſcle, it is diſtributed. The external maxillary ſupplies the place of the *temporal*, *labial*, *angular*, *naſal*, and *mental* arteries of mammalia.

The *laryngeal*, or *poſterior palatine* artery is a little branch of the external carotid, which is ſent off poſteriorly oppoſite to the external maxillary artery. Its branches are exhauſted upon the back part of the fauces, the muſcles for moving the upper jaw, and poſterior nares.

The *lingual*, or *ſub-maxillary* artery paſſes under the muſcles which connect the os hyoides to the lower jaw, and cloſe upon the back of the membrane of the lower part of the mouth, it ſends a branch to the œſophagus and trachea, ſupplies the muſcles of the os hyoides, the tongue, the lower ſurface of the mouth, and furniſhes the artery which enters the ſubſtance of the lower jaw.

Juſt at the origin of the ſub-maxillary artery, there is another little branch of the carotid, which is loſt upon the muſcles of the os hyoides.

The *internal maxillary* artery is, as uſual, the continuation of the trunk of the external carotid; it runs forwards between the pterygoid muſcle, and the lining of the mouth, upon the ſide of the long muſcle for moving the upper jaw, and divides into two principal branches; one of them proceeds under the tendon of the long muſcle to get upon the palate, where it forms two branches, of which one runs along the external ſide of the palate, between the membrane and the bone of the mandible to the extremity of the bill, where it becomes united to the ſame branch of the oppoſite ſide, as alſo to the middle artery of the palate. The other branch lies alſo ſuperficially under the membrane which lines the mouth. It paſſes onwards to meet its correſponding veſſel of the oppoſite ſide with which it becomes actually incorporated, and by their union a ſingle artery is generated, which runs along the middle line of the palate to the end of the mandible, where it unites with the lateral branches as already mentioned. At the junction of the veſſel of each ſide to form the middle palatine artery, two branches go off, which are loſt upon the lining of the mouth, and the interior of the organ of ſmell.

The other branch of the internal maxillary artery is reflected upwards towards the orbit, below which it divides and unites again forming a triangle, through which the vein paſſes; at this place it produces a remarkable plexus of veſſels, like the rete mirabile of the carotid artery of quadrupeds, which is increaſed by branches from the ophthalmic and the palatine arteries, and from which the back part of the organ of ſmell receives its ſupply of blood.

The internal maxillary artery then runs directly backwards below the orbit, paſſes between the radiated or fan-ſhaped muſcle which moves the upper jaw, and the pterygoid proceſs; and turning inwards round the baſis of the cranium becomes incorporated with the *internal* carotid artery juſt as it enters the boney canal, which conducts it to the brain.

The *vertebral artery*, ſoon after it parts from the carotid, ſends off a branch backwards, which paſſes over the neck of the ſcapula and is loſt among the muſcles on the poſterior part of the ſhoulder, inoſculating with the articular and other arteries about the joint; this branch might be called the *ſupra-ſcapular*. In the *duck* we have obſerved it before it makes the turn over the ſcapula to ſend an artery upwards along the muſcles of the neck.

The trunk of the vertebral artery proceeds obliquely upwards, and having entered the foramen in the tranſverſe proceſs of the ſecond cervical vertebra, gives off a large branch downwards, which is diſtributed between the vertebræ, and to the ſpinal canal in the manner of the intercoſtal arteries, with which it anaſtomoſes upon arriving in the thorax.

The remainder of the vertebral artery is continued upwards in the canal formed in the transverse processes of the cervical vertebræ, diminishing gradually in consequence of branches it sends off between each vertebra to the spinal marrow and the muscles of the neck. Near the head, the artery is found considerably reduced; and within the last foramen in the transverse processes, terminates entirely by inosculation with the reflected branch of the carotid, as before noticed.

The extraordinary anastomoses and the plexuses which are to be observed in the arteries of the head in birds are not easily accounted for. It seems possible that they may be required in consequence of the great length of the neck in these animals; it being well known that frequent communication amongst the vessels, although it diminishes the impetus of the circulation, insures a free and uninterrupted motion of the blood.

After the common trunk of the carotid and vertebral is detached from the arteria innominata, this vessel may assume the name of the *subclavian*. While passing under the clavicle, it sends off some important branches: the first might be called a *pectoral artery*, it proceeds upwards upon the internal surface of the pectoralis minimus muscle, which it supplies; and then dividing into two branches, one passes over the anterior edge of the clavicle, and under the pectoralis medius, between which and the sternum it runs, detaching its branches to the muscle; the other sends first along the under side of the clavicle a branch which is again subdivided and distributed to the outside of the shoulder joint and to the deltoid muscle, in which it inosculates with the articular artery. The vessel then passes between the clavicle and the fork-shaped bone, and on a ligament which connects the head of the clavicle to that of the scapula, and disperses its branches upon the upper part of the shoulder joint forming anastomoses with the neighbouring arteries.

The next branch of the subclavian is the *humeral artery;* is arises from the upper side of the vessel, and make a slight curve to reach its situation on the inside of the arm, in order to dispense its branches in the manner hereafter described.

The *internal mammary* artery is given off just as the subclavian leaves the chest. It divides into three branches, one ramifies upon the inner surface of the sternum; another upon the sternal ribs, and the intercostal muscles; and the third runs along the anterior extremities of the vertebral ribs, supplying the intercostal muscles, &c.

The chief peculiarity of the arteries of the superior extremity in birds, consists in the great magnitude of the vessels which supply the pectoral muscles; these, instead of being inconsiderable branches of the axillary artery, are the continuations of the trunk of the subclavian, of which the humeral is only a branch.

The *great pectoral or thoracic artery* passes out of the chest over the first rib, and close to the sternum, and immediately divides into two branches. One of them ramifies in the superior part of the pectoralis major, and the other is exhausted in the lower part of the muscle, and sends off a branch analogous to the long thoracic artery of mammalia.

The *humeral artery*, while within the axilla, gives a small branch backwards to the muscles, under the scapula, and upon reaching the inside of the arm produces an artery, that soon divides into the articular and the profunda humeri. The *articular* artery passes round the head of the humerus, underneath the extensors; its branches penetrate the deltoid muscle, and anastomose with the other small arteries around the joint.

The *profunda humeri* as usual turns under the extensor muscles, to reach the back of the bone, at which place, in birds, it separates into two branches, of which one descends upon the inside, and the other upon the outside of the articulation of the humerus with the radius and ulna, and there inosculate with the recurrent branches of the arteries of the fore arm.

After the humeral artery has sent off the profunda, it descends along the inner edge of the biceps muscle, detaching some branches to the neighbouring parts; upon arriving at the fold of the wing it divides into two branches, one of these is analogous to the ulnar artery, and the other from its position deserves to be called rather the interosseous than the radial artery.

At the place where the humeral produces the two arteries of the fore arm a small branch is sent off, which is lost upon the fore part of the joint, and it anastomoses with the recurrent of the ulnar, and the profunda humeri.

The *ulnar artery* is the principal division of the humeral; it proceeds superficially over the muscles which are analogous to the pronator, sends a large recurrent branch under the flexor ulnaris to the back of the joint upon which it ramifies and forms anastomoses with the profunda humeri. The artery then proceeds along the inner edge of the ulnar muscles, to which it distributes branches. It is afterwards seen passing over the carpal bone of the ulnar side, and under the annular ligament, at which place it sends off some branches which spread upon the joint and inosculate with similar ones of the interosseous artery. Very soon after the ulnar artery gets upon the metacarpus it dips in between the bones and re-appears upon the opposite side lying under the roots of the quills, to each of which it sends an artery; it preserves this situation to the end of the metacarpal bones, where it passes between the style analogous to the little finger and the principal or fore finger, and pursues its course along the edge of the latter, to the extremity of the wing, supplying each of the true quills with an artery and sending at each joint of the finger, a cross branch to communicate with the anastomosing branches on the opposite side.

The *interosseous* artery detaches first a branch of some size to the membrane which is spread in the fold of the wing, upon which it forms several ramifications. After this the artery dips down behind the pronator muscles to get into the space between the ulna and radius. It here gives a branch backwards to communicate with the others about the joint, and proceeds in the interosseous space as far as the carpal joint, during which course they become much diminished from giving off several branches which are distributed to the integuments and the quills placed upon the outside of the ulna. The remainder of the interosseous artery is expended in small branches upon the back of the carpal joint, the bastard quills, and along the radial edge of the metacarpus and bones of the fore finger, where it forms communications with the cross branches of the ulnar artery already mentioned.

From this description it will be perceived, that no artery exists in birds strictly analogous to the radial; that there are no palmar arches; and that the size of the interosseous artery, and the course of the ulnar along the outside of the metacarpus are peculiarities which arise from the necessity of affording a large supply of blood to the quills during their growth.

The *descending aorta* makes a curve round the right auricle in order to get upon the posterior surface of the heart, after which its course is close along the spine, in which situation it is bound down by cellular substance, and the strong membrane or aponeurosis, which covers the lungs on their anterior part. The first branches which this vessel appears to send off are *bronchial arteries;* they arise from the fore part of the aorta just when it arrives upon the spine; and having entered

entered the lungs, their ramifications accompany those of the pulmonary arteries. They appear also to send branches to the spine, and the spaces between the ribs.

The *intercostal arteries* do not take their origin from the aorta in numerous and regular branches as in mammalia, but consist originally of but few vessels, which are multiplied by anastomoses with each other, and with the arteries which come out of the spinal canal. An arterial plexus is thus formed round the heads of the ribs, from which a vessel is sent to each of the intercostal spaces. Many of these branches, besides supplying the intercostal muscles and ribs, are continued into the muscles upon the outside of the body and the integuments. The anastomosis of the intercostal arteries round the ribs is very similar to the plexus which is produced by the great sympathetic nerve in the same situation.

The aorta produces no branch which deserves the name of the *phrenic* artery, as birds do not possess that muscular septum of the body, to which the artery of this name is distributed in other animals.

The *cœliac artery* is a very large single trunk, and arises from the fore part of the aorta, even higher than the zone of gastric glands. It descends obliquely for a short way and then gives off a branch which soon divides into two or three others that are spread upon the lower parts of the œsophagus, and the side of the zone of gastric glands, uniting with the other arteries of the œsophagus above, and extending downwards upon the posterior side of the ventricle, and anastomosing with the anterior gastric artery. The trunk of the cœliac now divides into two very large branches, which from their distributions we have chosen to call the posterior and the anterior gastric arteries

The *posterior gastric artery*, almost as soon as it is formed, detaches the *splenic* artery; and very soon after, it furnishes from the posterior side of the vessel, the *right hepatic artery*. This branch proceeds to the right lobe of the liver, which it enters on the side of the hepatic duct; after having divided into two or three minute arteries on its way to the liver, it supplies the hepatic duct with a branch which accompanies the duct to the intestine, and is there lost. The posterior gastric artery then runs down upon the back of the gizzard, and opposite to the origin of the first intestine it sends off an artery which proceeds directly to one of the cæca, upon which and the side of the next intestine it is expended, inosculating at the end of the cæcum, with branches of the mesenteric artery, which are distributed to the adjoining portion of the small intestine. The posterior gastric then furnishes a large vessel which runs upon the gizzard and divides into two chief branches, which penetrate the substance of the digastric muscle, in which they are lost.

The next branch of the posterior gastric artery is the *pancreatic*. It runs between the two pancreatic glands, dispensing branches to each, and to the duodenum. After this the trunk of the posterior gastric divides into two branches which furnish twigs to the muscular parietes of the ventricle, and run along the margins of the upper and lower portions of the digastric muscle, supplying them with numerous twigs, and anastomosing with the ramifications of the other gastric arteries.

The *anterior gastric artery* descends to the angle formed by the bulbus glandulosus and the gizzard, and there sends off a small branch which spreads upon the zone of gastric glands, and inosculates with the first ramifications of the cœliac, and immediately afterwards it detaches a large artery, which runs round the superior margin of the digastric muscle, which it furnishes with many twigs, and communicates freely with the corresponding branch of the posterior gastric artery.

Three small *hepatic arteries* take their origin from this branch of the anterior gastric, just as it passes over the highest part of the margin of the gizzard; these vessels enter the fissure in the left lobe of the liver. The anterior gastric artery now proceeds along the fore part of the gizzard, sending one or two branches into the muscular substance, and near the tendon it terminates in two large vessels, one of which is distributed upon the left side of the digastric muscle and the other passes a little over the tendon and then divides into two arteries; which produce several branches that disappear in the substance of the gizzard, and between the digastric muscles and the parietes of the ventricle, anastomosing with the vessels of the posterior side.

The *superior mesenteric artery* takes its origin from the fore part of the aorta a little below the cœliac, and proceeds for some way without detaching any branches; after which it experiences the same kind of division and subdivision that takes place in mammalia; and the numerous arteries which are thus ultimately produced are spent upon the small intestines. One of the first and largest branches of the superior mesenteric, however, is allotted to supply one of the cæca, and establish a communication with the inferior mesenteric, and gastric arteries. This branch, soon after it leaves the trunk of the superior mesenteric, divides into two. One descends upon the rectum, where it meets with the inferior mesenteric artery, with which it produces a very remarkable anastomosis, similar to the mesenteric arch in the human subject: this united artery supplies the rectum and origin of the cæca. The second portion of this branch of the superior mesenteric, runs in the space between the last part of the small intestine, and the cæcum of one side, sending numerous branches to each, and at the end of the cæcum, communicates in a palpable manner with another branch of the superior mesenteric artery, which runs upon the adjoining part of the small intestine.

A branch arises from the anterior part of the aorta, just below the lungs; it is designed for the nutrition of the organs of generation, and except in the season for propagation, is so small as to be discovered with difficulty; but when the testicles become enlarged, it is considerably increased in size in the male bird, and much more so in the female, when the ovary and oviduct are developed for producing eggs. It nearly equals the superior mesenteric artery during the period of laying, in which state we shall describe it. It is a single artery like the cœliac and the mesenteric, proceeds at a right angle from the aorta, and soon sends off a branch which goes into the kidney of the left side, to which it gives some twigs, and afterwards emerging from the kidney, it runs in the membrane of the oviduct, upon which it is distributed. After this branch is detached, the artery projects a little farther forwards into the cavity and divides into two branches. One of these goes to the ovary, in which it ramifies, and furnishes an artery of some size to each of the cysts containing the ova. The other is distributed in numerous branches to the membrane and superior parts of the oviduct, and inosculates with the other arteries of the oviduct. It deserves to be remarked, that this and all the other arteries which are furnished to the oviduct, have a tortuous or undulating course, in the same manner as the vessels of the uterus of the human subject.

There are no regular emulgent arteries in birds; the kidnies deriving their blood from various sources, which will be pointed out as they occur.

The inferior extremity is supplied with two arteries, which have a separate origin from the aorta. One corresponds with the *femoral* artery, and the other deserves the name of *ischiadic* artery.

The *femoral artery* is a ſmall trunk which takes its origin from the ſide of the aorta, oppoſite to the notch in the bones of the pelvis immediately under the laſt rib. This notch is formed into a round hole in the recent ſubject, by a ligament which is extended from it to the rib; and it is through this hole that the femoral artery makes its exit from the pelvis; juſt before it paſſes out upon the thigh, it ſends off a long branch which runs backwards the whole length of the margin of the pelvis diſpenſing arteries to the abdominal muſcles on one ſide, and the obturator internus on the other. This branch alſo appears to ſupply one to the oviduct. The femoral artery, immediately after leaving the pelvis, ſeparates into two branches; one goes upwards and outwards, ramifying amongſt the muſcles in that ſituation; the other turns downwards, and is diſtributed to the flexors of the limb, and round the joint, and ſends an artery to the edge of the vaſtus internus, which can be traced as far as the knee. The kidnies appear to derive ſome irregular inconſiderable branches from the femoral artery while it is within the pelvis.

The *iſchiadic artery* is the principal trunk of the lower extremity, exceeding very much in ſize the femoral. When it is produced by the aorta, it appears to be the continuation of that trunk; the remaining part of the aorta becomes ſo much and ſo ſuddenly diminiſhed, and ſeems as it were to proceed as a branch from the back part of the veſſel.

The iſchiadic artery, while in the pelvis, is concealed by the kidnies, in which ſituation it gives a branch from its lower ſide, which divides into three others that are diſtributed to the ſubſtance of the kidnies: one of theſe on the left ſide is continued out of the kidney to be loſt upon the oviduct. The artery leaves the pelvis by the iſchiadiac foramen, in company with the great nerve; while within the foramen, it gives a branch obliquely downwards under the biceps to the muſcles lying on the pelvis; and as it paſſes over the adductor, it ſends off another along the lower edge of that muſcle, which is chiefly loſt in the ſemimembranoſus. It then detaches ſeveral ſmall branches to the muſcles on the outer and fore part of the thigh, ſome of which anaſtomoſe round the joint with the branches of the femoral artery. Juſt as the iſchiadic arrives in the ham, it furniſhes a very large branch downwards, which divides into two; one goes under the gaſtrocnemius, to which and the deep ſeated flexors its branches are diſtributed as far as the heel; the other is analogous to the *peroneal artery*; it goes to the outſide of the leg, ſupplies the peroneal muſcles poſteriorly, and paſſes along the outer edge of the flexors of the toes to the heel, above which, and behind the flexor tendon, it divides, running on each ſide of the heel, and forming ſeveral articular arteries around the joint, and communicating with the other branch, and with the anterior tibial, and the metatarſal branch of the plantar artery.

The *articular* arteries go off next from the artery in the ham; the two principal ones are deep ſeated. One proceeds under the vaſtus internus to the external part of the joint; the other is large, and ſituated upon the inſide. It forms two veſſels, one is the true articular artery, and ſpreads upon the ligaments of the joint, the other is diſtributed in the ſubſtance of the flexor of the heel, which is placed upon the inſide and fore part of the leg, and comes out upon the edge of this muſcle to be loſt in the integuments.

The *poſterior tibial artery* is extremely ſmall; it only ſupplies muſcular branches to the internal head of the gaſtrocnemius, and ſome of the flexors of the toes; it is loſt on the inſide of the heel in anaſtomoſes with the peroneal artery, and other ſmall ſuperficial branches.

The trunk of the artery of the leg now gets upon the poſterior ſurface of the tibia, and ſends off through the deficiency left between the tibia and fibula at the ſuperior part, a branch, which is diſtributed to all the muſcles upon the fore part of the leg. The artery then creeps along the back of the bones for ſome way, and paſſing between them above, where the fibula is anchyloſed with the tibia, it re-appears on the anterior part of the leg in the ſituation of the *anterior tibial artery*; at this place it detaches ſome very ſmall branches, which frequently divide and unite again, to produce a moſt ſingular reticulation or plexus of veſſels, which cloſely adheres to the trunk of the artery, and is continued with it as far as the articulation of the tibia with the metatarſal bone, where it diſappears without ſeeming to anſwer any uſeful deſign. This plexus reſembles in appearance exactly the diviſion of the arteries of the extremities, which has been deſcribed by Mr. Carliſle in the tardigrade quadrupeds, but differs from it in this circumſtance, that the trunk of the artery is preſerved behind it, without ſuffering any material diminution of its ſize.

The anterior tibial artery furniſhes no branch of any importance during the time it is proceeding along the fore part of the leg. It paſſes under the ſtrong ligament which binds down the tendons of the anterior muſcles of the leg, and over the fore part of the joint on the inſide of the tendon of the tibialis anticus; at which place it diſtributes ſome branches which inoſculate with the other arteries round the joint; it then purſues its courſe in the groove along the anterior ſurface of the metatarſal bone, and covered by the tendon of the flexor digitorum. On coming near the foot, it ſends off an artery, which divides, behind the joint of the internal toe, into two branches; one goes between the internal and middle toes, ramifies upon both their joints, and unites with the artery in the ſole of the foot; the other is diſtributed between the internal toe and the pollex or toe which occupies the place of the great toe; the main artery now paſſes to the ſole of the foot through a hole in the metatarſal bone left for the purpoſe, when the original parts of this bone were united by oſſification. In this ſituation the artery might receive the name of the *plantar*. It has ſcarcely paſſed through the bone, when it divides into ſix branches; three of theſe are diſtributed to the tendons and ligaments, &c. on the outſide of the foot and the back of the metatarſus, anaſtomoſing with the deſcending branches of the peroneal artery; the fourth branch ſupplies the pollex, and alſo ſends a branch upon the metatarſus. The remaining branches are deſigned for the three principal toes; one dips in between the internal and middle toe, unites with the anterior branch of the metatarſal artery, and is diſtributed to the ſides of theſe toes as far as their extremity. The other divides, between the external and middle toe, into two branches, which run upon the oppoſite ſide of each of theſe toes to the end.

When the feet are webbed, the digital arteries ſend off numerous branches, which ramifying in the membrane between the toes, eſtabliſh a communication with each other. The preſent deſcription has been taken from birds which poſſeſs three principal toes, and the back toe, or pollex; but no material difference can be expected in thoſe with a greater number of toes.

After the trunk of the aorta has detached the iſchiadic arteries, it is continued along the ſpine, ſending ſmall branches analogous to the *lumbar* arteries, one of which aſcends upon the rectum, ſupplies the place of the *inferior meſenteric*, and unites with the ſuperior meſenteric, as already mentioned. The aorta ſeparates above the coxygeal vertebræ into three branches; two of theſe proceed late-

terally, and are diſtributed to the neighbouring parts, and to the kidnies and oviduct; the third branch deſcends to the very point of the tail, upon the muſcles and quills of which its branches are exhauſted.

The arterial ſyſtem of birds differs from that of other animals chiefly in the frequent anaſtomoſes, which exiſt more eſpecially amongſt the arteries of the head and the viſcera. Similar communications occur between the veins, which are even in ſome inſtances more ſingular and unaccountable, as will be perceived by the following deſcription, which has been taken principally from the *gooſe*, *duck*, and *common fowl*.

Veins.

The venous ſyſtem returns the blood to the heart by means of three trunks; two of theſe, for the convenience of deſcription, we ſhall call the ſubclavian veins, although they do not correſpond in every reſpect with the veins of this name in mammalia; the other trunk is analogous to the inferior vena cava.

The *ſubclavian vein* is compoſed of the jugular and vertebral, and the veins which belong to the ſuperior extremity or wing.

The *vertebral vein* is lodged in the ſame canal with the vertebral artery; it anaſtomoſes between the vertebræ with the veins upon the ſheath of the medulla ſpinalis, which are the continuation of the ſinuſes of the brain; in conjunction with theſe, therefore, the vertebral vein may be conſidered as anſwering the purpoſe of the internal jugular of mammalia. It appears alſo to form at the baſis of the cranium a free communication with the jugular vein, and to receive by occaſional branches, blood from the muſcles of the neck.

The *jugular vein* is a ſingle trunk in birds, and does not admit of the diſtinction into external and internal; it proceeds ſuperficially along the ſide of the neck in company with the par vagum nerve. The vein of the right ſide exceeds the other in ſize; it is often twice as large. The jugular vein receives ſeveral lateral branches from the muſcles and integuments of the neck, the œſophagus, &c.; one of thoſe near the head is much larger than the reſt; it lies deep amongſt the muſcles, and appears to communicate with the vertebral vein. There is a branch of the jugular which goes amongſt the muſcles of the tongue and of the os hyoides, and another for the muſcles within the jaws and the integuments in the back of the mouth; theſe might be called the *lingual* and *ſubmaxillary* veins.

The two jugular veins form a moſt remarkable communication with each other immediately below the cranium, by means of a croſs branch, generally of an equal ſize with the trunks themſelves. From each ſide of the arch thus formed there iſſues a large veſſel, which is made up of the veins of the external part of the head; one of theſe paſſes round the articular bone, and apparently penetrates the joint of that bone with the lower jaw; it appears in ſeveral branches upon the ſide of the cheek, and ſpreading from the ear, in the manner of the portio dura nerve of the human ſubject, and contributes to form a plexus of veins below the poſterior part of the orbit, ſimilar to the arterial plexus already deſcribed in that ſituation. The principal branch of the veins of the head paſſes obliquely round the inter-articular bone, and below the orbit divides into ſeveral large veſſels; one of which belongs to the back part of the palate; another aſcends in the orbit, and unites with the ophthalmic vein; and a third is diſtributed to the anterior of the organ of ſmell, the palate, and the external parts of the upper and lower jaws. Theſe branches produce plexuſes along the baſe of the orbit and the external edge of the palate, which correſpond to thoſe of the arteries before deſcribed.

In all the ſubjects we diſſected for the veins we failed to diſcover any direct communication between the jugular vein and the ſinuſes of the brain; and in every inſtance the external veins of the head appeared to be ſufficiently large of themſelves to produce the trunk of the jugular. It may therefore be preſumed, that if any branch analogous to the internal jugular vein paſſes through the poſterior foramen lacerum, it is very inconſiderable, and incapable of tranſmitting the blood of the brain.

The *ſinuſes of the brain* ſeem to diſcharge their contents principally into ſome veins, which lie in the membrane forming the ſheath of the ſpinal canal, and theſe appear to diſpoſe of their blood gradually, as they deſcend in the neck, by means of lateral communication with the vertebral veins. The ſinuſes, which immediately open into the ſpinal veins, are ſituated upon the back of the cerebellum, and produce by anaſtomoſes with each other, with the ſuperior longitudinal ſinus, and with others along the ſides of the brain, an union of veſſels, of a diamond ſhape.

The ſinuſes of the brain in birds generally are irregular in their form, and conſiſt of flattened canals; and not only the ſinuſes on the back of the cerebellum, but the ſpinal veins appear ſo like extravaſation, that accurate and repeated obſervations are neceſſary to diſcover them to be real veſſels.

The principal ſinuſes, beſides thoſe upon the cerebellum, are the ſuperior longitudinal, and one which runs along the lower edge of each hemiſphere of the cerebrum; there appears to be alſo one upon the ſide of the cerebellum, correſponding to the lateral ſinus. All theſe ſinuſes communicate with each other on the back of the cerebellum as already mentioned. The ſuperior longitudinal ſinus is continued at its anterior part under the frontal and naſal bones, and anaſtomoſes with the ophthalmic and naſal veins. There are other ſinuſes in the ſeveral duplicatures of the dura mater, which are too ſmall to be eaſily traced, or to deſerve much regard.

The *veins of the wing*, or ſuperior extremity, have a leſs curious diſtribution than thoſe of the head. The branches which are derived from the parts within the cheſt, the muſcles about the ſcapula, and the pectoral muſcles, accompany the arteries of the ſame parts, ſo regularly that their courſe does not require deſcription.

The vein lies conſiderably lower in the axilla than the artery, but ſtill continues to receive correſponding branches. The trunk of the vein deſcends in the courſe of the humeral artery, but more ſuperficially; in this ſituation it may be called the *baſilic*, or more properly the *humeral* vein. There is no vein in birds which deſerves the name of the *cephalic*; there are branches of the humeral vein, accompanying the articular and profunda arteries, and at the middle of the humerus, a large branch of the vein enters the bone; there are alſo two very ſmall branches which lie in cloſe contact with the humeral artery, which they accompany nearly its whole length.

The principal vein of the wing divides into two, oppoſite to the joint of the humerus with the fore arm. One of theſe branches belongs to the ſides of the radius; it receives blood from the muſcles and ſkin on the upper part of the fore arm, but its chief veſſels lie between the integuments of the fold of the wing. The other branch of the humeral vein croſſes the fore arm, juſt below the articulation, in company with the nerve, and running along the inferior edge of the ulna, receives a branch from between the baſis of each quill, is continued along the ligament which ſuſtains the reſt of the

the quills to the extremity of the wing, receiving many veins of the joints from the oppofite fide of the fingers. Befides thefe large fuperficial veins of the fore arm, there appears to be one, and fometimes two, fmall accompanying veins to the ulnar and interoffeous arteries.

The *inferior vena cava*, before it enters the auricle, receives as ufual the hepatic veins; thefe are numerous, and open into the cava, as it paffes behind the liver, or more frequently within the fubftance of that vifcus in that back part. We have reckoned in the *cock* two large and two fmall hepatic veins from the right lobe, and one large branch from the left lobe, befides fix minute veins, which came indifferently from both lobes.

The trunk of the vena cava is very fhort in the abdomen; it feparates into two great branches analogous to the *primary iliac veins*, oppofite to the renal capfules; thefe turn to each fide, and experience a very fingular diftribution. On coming near the edge of the pelvis each of thefe two veins forms two branches; one of which collects the blood of the lower extremity, as hereafter defcribed; the other paffes ftraight downwards unbedded in the fubftance of the kidney, and admits the feveral emulgent veins, which are very large, and are feen to pafs for fome way obliquely in the kidney, before their termination. The defcending branch of the iliac alfo receives the ovarian veins, and when arrived at the lower end of the kidney, divides into three branches; one tranfmits the blood of the mufcles of the tail and parts adjacent; another accompanies the ureter to the fide of the rectum, and is diftributed about the anus and parts of generation, anfwering to the *hæmorrhoidal veins*; the third paffes inwards to the middle line between the kidnies, and there unites with the correfponding branch of the oppofite fide. The veffel which is in this manner produced, receives all the blood of the rectum from the anus to the origin of the cœca, anaftomofing below with the branches of the hæmorrhoidal veins; and at the upper part of the rectum, it becomes continuous with the trunk of the veins of the fmall inteftines, forming the moft remarkable anaftomofis in the body, both on account of its confequences and the fize of the veffels by which it is effected. By means of this communication, the blood of the vifcera, and the external parts of the body, flows almoft indifferently into the vena cava and vena portæ; for the anaftomofing veffels are fufficiently large to admit the ready paffage of a confiderable column of blood in proportion to the whole mafs which circulates in the body of the bird: for inftance, in the *goofe*, the communicating veins of the pelvis are equal in fize to a goofe quill, and in the *oftrich* and *caffowary* they are as thick as a finger. The advantage which appears to refult from this remarkable union of veffels, is the prevention of congeftion, or the overloading either the heart or liver with blood, as the one organ has the power of relieving the other. It would feem from this, as well as feveral other provifions of the fame kind, that the circulation would be more liable to obftruction in birds than other animals. It is difficult to fay, however, to what caufe fuch an effect ought to be afcribed. Is it from the compreffion fuftained by the heart and other vifcera, by means of the air-cells during refpiration? Or, is the mode of progreffion by flight capable of impeding the motion of the blood?

The anaftomofis of the pelvic veins, in being the means of conveying common venous blood into the liver, goes to prove, that the blood of the vena portæ does not require any peculiar preparation by circulation in the fpleen or other vifcera, which has been conceived as neceffary by fome phyfiologifts to fit it for the fecretion of bile.

The *vena portæ* belongs almoft exclufively to the right or principal lobe of the liver. It is formed by three branches. The *fplenic vein* is the fmalleft, and is added to the vena portæ, juft as it penetrates the liver on the fide of the hepatic duct. The next is made of two branches; of which one returns the blood of the poftcrior gaftric artery, and therefore may be called the *poftcrior gaftric* vein; and the other is furnifhed by the pancreas and duodenum, and therefore is the *pancreatic* vein. The third and largeft branch of the vena portæ is the *mefenteric vein*, which not only collects the blood from all the fmall inteftines, but likewife receives the *inferior mefenteric*, or vein of the rectum, which forms the communication that has been defcribed with the pelvic veins.

The *veins of the left lobe of the liver*, are furnifhed in the *goofe* by thofe which accompany the anterior gaftric artery, and fome branches from the head of the duodenum.

The *anterior gaftric veins* produce two fmall trunks, which enter at the two extremities of the fiffure, in the concave furface of the left lobe of the liver, as it lies upon the edge of the gizzard; the veins from the head of the duodenum furnifh a fmall veffel which paffes backwards to penetrate the poftcrior part of the fiffure in the left lobe.

In the *cock*, the veins that the left lobe of the liver derives from the anterior gaftric, are more numerous than in the *goofe*.

The veins of the zone of gaftric glands, and of the lower portion of the œfophagus, do not contribute to the fecretory veffels of the liver, but proceed to the fuperior part of that vifcus, to terminate in the vena cava; as does alfo the umbilical vein.

The vein which returns the blood of the inferior extremities, is divided in the pelvis into two branches, which correfpond with the femoral and ifchiadic arteries; the one paffes through the ifchiadic foramen, and the other through the hole upon the anterior margin of the pelvis: but the proportion they bear to each other in magnitude, is the very reverfe of what occurs in the arteries; for the anterior vein is the principal one, whilft the other is not a very confiderable veffel, and receives its fupply of blood from the mufcles at the poftcrior part of the joint.

The *femoral vein*, immeditately without the pelvis, gives branches on both fides, which receive the blood of the extenfor and adductor mufcles at their fuperior part: the trunk paffes obliquely under the acceffory mufcle of the flexor digitorum, and over the os femoris, where it lies fuperficially; it then winds under the adductor mufcles, and gets into the ham, where it receives many mufcular branches, and comes into company with the artery and nerve. It here divides into the *tibial* and *peroneal* veins. The firft is joined by fome branches from the furface of the joint anfwering to the articular arteries; it alfo receives the *anterior tibial* vein which accompanies the artery of the fame name. The tibial vein proceeds down the leg along with the artery on the infide of the deep-feated flexors of the heel: it turns over the fore part of the articulation of the tibia with the metatarfal bone, in order to get upon the inner fide of the metatarfus; above the origin of the pollex, it receives a communicating branch from the peroneal vein, and immediately after, two branches from the toes; one of them comes from the infide of the internal toe; the other arifes from the infide of the external and middle toes, unites at the root of the toes in the fole of the foot, and is joined by a branch from the pollex, before its termination in the internal vein of the metatarfus.

The *peroneal vein* derives its principal branches, along with thofe of the peroneal artery, from the mufcles on the outfide of the leg. The trunk of the vein comes out from the

peroneal muſcles, and paſſes ſuperficially over the joint at the heel, and along the outſide of the metatarſus: near the pollex, or great toe, it ſends a branch round the back of the leg, to communicate with the tibial vein; after which, it is continued upon the outſide of the external toe to the extremity, receiving anaſtomoſing branches from the tibial vein.

Where the veins run ſuperficially upon the upper and lower extremities, they ſeem to ſupply the place of the branches of the *cephalic*, *baſilic*, and the two *ſaphenæ*; but the analogy is loſt upon the upper arm and thigh: theſe branches forming deep-ſeated trunks: this conſtitutes the greateſt peculiarity in the diſtribution of the veins in the extremities of birds.

Kidnies.

Theſe organs occupy the poſterior part of the common cavity of birds, from the laſt rib to near the coxygeal vertebræ: they fill all the cavities and depreſſions of the bones of the pelvis; the poſterior ſurface, therefore, of the kidnies is extremely irregular; their anterior part is rather flat, and they are notched upon the external edge, which gives uſually the appearance of their being compoſed of three lobes; but the inequalities of the edge ſeem to ariſe rather from the kidnies being larger at one place than at another, than from an original diviſion into lobes: the prominences correſpond to the moſt depreſſed parts on the pelvis; accordingly, the kidnies are obſerved to form a projection at the upper end, where they lye on the depreſſion of the oſſa ilia, again oppoſite to the hollow on the inſide of the iſchiadic foramen, and laſtly, at the lower part of the kidney, where it fills the concavity of the iſchium.

The kidnies have a covering of thin peritoneum, and under this, they ſeem to poſſeſs another thin membranous tunic, which cloſely inveſts them, as well where they are applied to the bones, as anteriorly; this coat alſo appears to be reflected into the ſubſtance of the kidnies, and to form the cellular connections of the different parts which compoſe theſe organs. According to the academicians, the kidnies of the *cormorant* are ſeparated from the other parts of the lower belly, by a diſtinct membrane, and inſtead of being divided into three lobes, are toothed like a cock's comb on their gibbous part.

The texture of the kidnies is very fragile; readily giving way under the ſlighteſt injury. They yield to the preſſure of the finger a granular feel, as if compoſed of a number of minute bodies, eaſily ſeparable from each other: the ſurface of the kidnies, alſo, preſents the appearance of an aggregation of ſmall glands.

The trunks and larger branches of the blood-veſſels of the kidnies have been already deſcribed. The termination of the minute ramifications of the artery cannot be ſo clearly perceived as in mammalia. When coloured fluids are thrown in by the artery, the whole ſubſtance of the kidney appears to equally admit the injection: the minute branches of the blood veſſels are too numerous, therefore, to allow of a diſtinct view of the figure aſſumed by the ſecretory extremity of the artery; but it is probable, from the ſtructure of the kidney differing in other circumſtances, that it is not wound into a coil, as in man and quadrupeds.

The kidnies of birds, in general, do not poſſeſs any cavity for collecting the urine, previous to its expulſion by the excretory duct: each of the little maſſes which form the original glands, produces a duct; theſe are joined by the neighbouring ducts, and thus others are generated, which terminate in the *ureter* or common excretory duct of each kidney. The ureter lies upon the anterior ſurface of the kidney, partially embedded in its ſubſtance, ſo that it is viſible along the whole gland, except at the upper part.

The members of the academy deſcribe the kidnies of the *oſtrich* as being evidently compoſed of diſtinct glands, and that the ureter did not lie as in other birds, ſuperficially, but was concealed in the glandular ſubſtance; in which ſituation it ſuffered a degree of dilatation, forming as it were, a *pelvis*, the whole length of the kidney, into which the different excretory ducts diſcharged their contents; not, however, from *papillæ*, as in mammalia, but by open and plain orifices. Mr. Ranby, in his account of the anatomy of the *oſtrich*, ſtates, that he found the ureters occupy their uſual ſituation on the middle line of the anterior ſurface of the kidney; but that the ſuperior branch of the ureter was very conſpicuous, and entered the middle of the kidney, where it formed a very large *pelvis*.

The ſtructure of the ureters appears to be exactly the ſame which theſe ducts poſſeſs in the human ſubject.

The courſe of the ureters, after leaving the kidnies, is behind the rectum, to which they become connected by the peritoneum covering the inteſtine: they proceed, for a very little way, involved in the coats of the back of the rectum, and open uſually upon two little papillæ, which project into the cloaca, or termination of the rectum. The orifices of the ureters in the cloaca, are much leſs than the width of tubes to which they belong; this, therefore, added to the obliquity with which they perforate the cloaca, anſwers all the purpoſes of a valve, and prevents any regurgitation of the urine back upon the kidnies.

The Pariſian diſſectors obſerved in the *caſſowary* and *demoiſelle* of *Numidia* (*ardea virgo*), that the ureters became united to the excretory duct of the teſticle, at the lower part of the kidney; the common duct produced by their union terminated, as uſual, in the back of the cloaca. This ſtructure certainly does not exiſt in the generality of birds.

The above deſcription anticipates the obſervation, that birds are unprovided with any diſtinct reſervoir for urine; analogous to the *bladder*: it is the caſe throughout the whole claſs, without an exception, that the fæces and urine are expelled together; but the dilatation of the end of the rectum or cloaca, in ſome ſpecies, ſupplies the want of the urinary bladder in a great degree, and renders the ejections of both the urine and fæces leſs frequent than they would otherwiſe be, by affording a temporary accommodation to a conſiderable quantity of excrement. Theſe dilatations are remarkably large in the *oſtrich*, *parrot*, &c. See that part of the article which treats of the great inteſtine of birds.

It is a matter of common obſervation, that the excrements of birds are of a white colour, and appear as if they contained ſome cretaceous ſubſtances: this effect is univerſally attributed to an admixture with the urine, which is ſuppoſed to be of this colour and conſiſtence; it deſerves to be mentioned, however, that if the urine be expreſſed from the kidnies, or examined before it has paſſed into the rectum, it is neither white, nor of a chalky conſiſtence, but a limpid aqueous fluid, which exhales an urinous ſmell, that is very perceptible in the larger birds, from which ſome quantity of the urine may be obtained, by compreſſing the kidnies. It would ſeem more probable, that the white and chalky appearance of the excrements of birds, depended upon the quantity of calcareous matter contained in the ſolid parts of the fæces, than that it is derived from the urine. In proof of this ſuppoſition, it may be remarked, that

that upon one occaſion, where we fed a fowl with madder for a different purpoſe, the cretaceous part of the excrement loſt its uſual whiteneſs, and became of the pale pink colour which madder is well known to communicate to calcareous earths.

Renal Capſules.

Theſe bodies hold the ſame ſituation is birds as in mammalia; they alſo uſually poſſeſs an irregularly triangular figure. The proportion which they bear in ſize to the kidney, is perhaps leſs than generally occurs in quadrupeds. In the *gooſe*, they are each about as large as a pea. The colour of the renal capſules is in every inſtance more or leſs yellow. Several of the older anatomiſts have deſcribed a ſingle renal capſule in ſome ſpecies of birds: the miſtake ſeems to have ariſen from their being occaſionally ſo cloſely applied to each other, that they appear as one body.

The renal capſules of birds do not poſſeſs any cavity or dilated part for venous blood, which renders it probable that the enlargement of the capſular vein, which has attracted ſo much attention in the human ſubject, is no way concerned with the function of theſe bodies.

Having diſcuſſed the ſtructure and operations of thoſe organs which are more immediately concerned in ſupporting the life of the individual, we ſhall proceed to conſider thoſe which are ſubſervient to the ſecond order of functions.

ORGANS EMPLOYED IN THE EXERCISE OF THE GENERATIVE FUNCTIONS.

Male Parts of Generation.

The *teſticles* of birds are always two in number; they are ſituated on the inſide of the body, high up in the loins, upon the ſuperior edge of the kidnies; from which poſition they never deſcend at any period of life, as in mammalia. Conſequently, birds are not provided with a *ſcrotum*, or any external pouch for the accommodation of thoſe glands. The figure of the teſticles is moſt commonly oval; occaſionally they are of an elongated form, as in the *caſſowary*. See *Plate* VII. in the *Anatomy of Birds; fig.* 1. Sometimes the teſticles are nearly round, as in the *curaſſow*, and other inſtances

The teſticles appear to receive a covering from the peritoneum; but their proper tunic is remarkably ſtrong, denſe, and inelaſtic.

It will always be a matter of great difficulty, to exhibit ſatisfactorily, the intimate ſtructure of the teſtes of birds, as a ſucceſsful injection from the vas deferens is nearly impoſſible. The ſeminiferous tubes are ſo tender, that they do not ſuſtain the leaſt force without being ruptured; and at the period when the teſtes are fully developed, they are loaded with their own ſecretion, a circumſtance highly unfavourable to the expoſition of the ſtructure of theſe organs by the means of injection. The blood-veſſels of the teſticle are eaſily traced; ſome of them paſs in the uſual manner directly from the back part, through the glandular ſubſtance, to the ſurface, where they unite with others which ſpread in an arboreſcent form, under the capſules of the teſtes. The great maſs of theſe glands is evidently made up of tubes, which are convoluted in all directions, and are ſeparated into bundles or packets, by very thin cellular membranes. Their connection with the ſecretory extremities of the ſpermatic arteries, and their termination in the excretory duct, are, however, involved in obſcurity, for the reaſons already given.

The teſticles of birds differ very much in ſize at different ſeaſons of the year. When theſe organs are not exerciſed in the act of generation, they become remarkably diminiſhed; but, during the period in which the female lays her eggs, they acquire a bulk even beyond what might be expected, from the ſize of the bird to which they belong. This ſubject has been ſtrikingly illuſtrated by Mr. Hunter, in a ſeries of figures repreſenting the variation of bulk which takes place every ſpring in the teſticles of the *common ſparrow*; by which it is ſhewn, that the teſticles of this bird are ordinarily about the ſize of pin-heads, but, during the ſeaſon of propagation, acquire nearly the bulk of piſtol balls. See *Plate* VII. in the *Anatomy of Birds*; N° 1. exhibits the teſtes as they exiſt in the month of January; N° 2. as they are in the middle of February; N° 3. as they are found in the beginning of March; N° 4. their ſize in the latter end of March; and N° 5. the bulk they aſſume in the middle of April.

The *vas deferens*, or excretory duct, ariſes uſually from the poſterior part of the teſticle, and probably always ſuffers a certain degree of convolution or coiling upon itſelf, correſponding to the *epidydimis*, which generally differs more or leſs in colour from the body of the gland. In the *curaſſow* and *buſtard*, it has been obſerved to be black; in the *caſſowary* yellow; and in the *ardea virgo*, a green colour. The academicians repreſent the epidydimis of the *caſſowary* as being extended for ſome way above the teſticle, and conſiderably enlarged at the top. See *Plate* VII. in the *Anatomy of Birds*. *Fig.* 1. *a a* the two teſtes; *b b* the epidydimis of each ſide; *c c* the vaſa deferentia; *d d* the ureters coming from the kidney to unite with the vaſa deferentia; *e e* the excretory ducts common to both the kidnies and the teſticles.

In the *oſtrich*, the epidydimis turns up on the ſide of the teſticle; and in the *ardea virgo*, it is pendulous from it, and only connected by one end. The vas deferens alſo in this bird, appears to ariſe from the body of the teſtis, inſtead of the epidydimis; and at its lower part, the duct unites with the ureters, in the ſame way as is repreſented in the *caſſowary*. In the *caſſowary*, the epidydimis is ſituated below the teſticle, which it almoſt equals in ſize.

In moſt birds the vaſa deferentia proceed to their termination, without undergoing any remarkable degree of convolution, or experiencing any dilatation analogous to the *veſiculæ ſeminales*; but in the *cock*, theſe ducts are compoſed of convolutions or reflections of a tube from ſide to ſide, which are ſo cloſely applied to each other, that a longitudinal ſection of the duct preſents the appearance of a ſeries of cells, which ſeem to communicate with each other in the middle. Theſe become larger and more numerous towards the lower part of the vas deferens, and are capable of containing a conſiderable quantity of ſemen. It may be preſumed, therefore, that the *cock*, and other ſalacious birds, are provided with theſe receptacles of ſemen to enable them to meet the exigency of frequent copulation; and it is alſo to be obſerved, that thoſe birds which have the vaſa deferentia more ſimply formed, do not perform the act of coition ſo rapidly as the gallinaceous fowl. See *Plate* VII. in the *Anatomy of Birds*. *Fig.* 2. exhibits the genital or organs of the *common cock*; *a a* the teſticles of an oval ſhape; *b b* the epidydimis at the poſterior part of each; *c c* the vaſa deferentia, one of which is cut open to expoſe the loculated appearance it preſents internally.

The *penis*, in thoſe birds where it has been obſerved to exiſt, is fixed upon the end of the rectum, immediately within the verge of the anus; it is uſually of a pyramidal figure, and in its ordinary ſtate is twiſted like a ſcrew; its external tunic is derived from the inteſtine, and is formed into a number of little rugæ, or proceſſes, giving the edges of the penis, in its contracted ſtate, a jagged or notched appearance. The body of the penis is compoſed of a white ligamentous

mentous substance, which supplies the place of the *corpora cavernosa*, but does not seem to contain any cells or cavity [illegible].

There is a groove, corresponding to the *urethra*, along the side of the white ligament; it takes the spiral course of the penis, and in no instance could we discover that it formed a distinct canal, the external coat of the penis appearing always to dip into the groove, so that it was visible externally; and hence it might be said that the *urethra* of birds is situated upon the outside of the penis. See *Plate* VII. in the *Anatomy of Birds*. *Fig.* 3. represents these parts as they are found in the *gander*; *a* the penis, shaped like a screw, with the edges denticulated or notched by the folding of the external coat; *b b* the urethra commencing upon the left side of the penis, and continued upon the same side around the spire or screw; and at the end of the penis the sulcus gradually disappears.

The form of the *ostrich*'s penis is not spiral; it is also smooth upon the surface, and in shape it has been likened to a calf's tongue. The Parisian anatomists describe it as being composed of white thick membranes, and of two strong hard ligamentous substances. They appeared to consist of very compact transverse fibres; one of the membranes was thicker than the other, and afforded a covering to the penis; the other enveloped immediately each of the two ligaments, which were separated from each other, and united about two fingers from the extremity. One was longer than the other, and measured two inches. The origin of the penis was at the cartilaginous swelling, which is situated at the junction of the bones of the pubis; from thence it was turned downward, and contained in a little pouch, which was placed at the lower part of the cloaca, in which the penis was continued to the anus. This small pouch can be distinctly separated from the large bag of the cloaca, by the contraction of the margin of its foramen. The lesser pouch only permits the excrements to pass from the other occasionally, and when it is closed, forms a sort of sheath for the penis.

The penis of birds receives some distinct muscular fasciculi from the rectum, which are inserted into the root of the ligamentous body; they appear to have the power of retracting it, or rolling it into the spiral form, and may perhaps render it more steady during coition.

The muscles of the penis are large in the *ostrich*. The academicians describe four of them, two on each side. The two first took their origin from the internal part of the os sacrum, and descended along the pouch of the rectum, for the space of two lines, which they penetrated near the extremity, and passing under the sphincter ani, were inserted at the base of the penis. The two other muscles went from the internal part of the os ilium towards the bottom of the kidnies, and descended by the sides of the ureters, and after perforating the rectum, were attached to the lateral parts of the penis.

The penis of birds is unfurnished with any structure similar to the *glans* or *prepuce*; from which it might be questioned whether it is capable of receiving any peculiar sensations during the act of copulation. It would seem probable, however, that the penis is the chief seat of pleasure in birds as well as mammalia, because it changes its form during coition, and experiences a great degree of relaxation afterwards. The penis of the *drake* is protruded some inches out of the anus during the performance of the venereal act; and after the orgasm is concluded, it is so much relaxed, that the animal has not the power of retracting it for some minutes; in which condition the penis hangs from the anus, and so much resembles an earthworm, that the ducks mistake it for one, and attempt to swallow it. It is remarkable, however, that the greater number of birds are either unprovided with a penis, or have merely a rudiment of it, which is incapable of conducting the semen into the organs of the female.

In those birds which want the penis, it is very easy to perceive the manner in which the vasa deferentia terminate: thus, in the *common cock* they can be readily traced passing along the sides of the ureters to the back of the cloaca, into which they open a little lower than the ureters upon two papillæ, which are elevated upon a ridge formed by the internal coat of the intestine, just within the verge of the anus. These papillæ are prominent and sharp-pointed; and although the ducts are of some size immediately behind, the aperture on the point of the papillæ is so extremely small, that it is discovered with difficulty, and will scarcely suffer the fine bristle to pass through it. See *Plate* VII. in the *Anatomy of Birds*, *fig.* 2.; *c c* the two sharp papillæ, upon the points of which the vasa deferentia terminate in the *cock*. A bristle is introduced into one of them, and above them, and nearer the centre of the intestine are seen the orifices of the ureters designated by the letters *d d*.

As these birds have no means of conveying the semen into the body of the female, a mutual eversion of the extremity of the intestine always takes place during the copulation of fowls.

The termination of the excretory ducts of the testicle are difficult to discover in most of the birds which are furnished with a penis. This arises partly from the coats of the ducts becoming extremely thin and delicate near the extremity, and partly from the papillæ upon which they open into the gut, being in those cases so small as very easily to escape observation.

The academicians did not succeed in tracing the vasa deferentia to their termination in any of the birds they dissected. They relate, however, that the penis of the *ostrich* and *cassowary* had no communication with the ducts, nor did they contain any tube in the internal part by which they could give passage to the semen. In all the birds we have examined, we could not perceive the least appearance of a canal in the interior part of the penis, or any means of communication between it and the vasa deferentia.

In the *gander* we have been able to discover the mode in which the semen is discharged from the excretory ducts. At some distance behind the root of the penis there are two papillæ, surrounded by a number of small follicular glands; they are not so far asunder as those of the *cock*, and so little prominent, that unless minutely examined, they are not distinguishable from the glandular parts of the surface of the intestine which lie next them, and might easily be mistaken for a prominent edge of one of the follicles: from the point of these papillæ a duct can be traced, as in the *cock*, to the back of the intestine; but furnished with coats so thin that it is perfectly transparent. See *Plate* VII. in the *Anatomy of Birds*, *fig.* 3. *c c* the small papillæ on which the vasa deferentia terminate in the *gander*. Some small follicular glands are seen around them, and farther within the intestine the ureters open, as indicated by the letters *d d*; at these points also there are some small mucous glands.

Mr. Home has described the penis of the *drake* as possessing a distinct canal analogous to the urethra of mammalia, into which the vasa deferentia enter close to its origin at the verge of the anus. He states the penis to measure, when pulled out to its full extent, six inches long, but that when left to itself it disappears within the verge of the anus, in consequence of the contractile power of the urethra. (See Phil. Transact. vol. xcii. p. 361.) The representation of the penis of the *drake* is copied in *Plate* VII. of the *Anatomy of*

of Birds, fig. 4, *aa* the verge of the fundament surrounded by feathers; *bb* the urethra, or seminal canal laid open throughout its whole extent; *cc* the orifices of the vasa deferentia; *dd* the external tunic of the penis laid open, and from its elasticity thrown into serpentine folds.

It deserves to be mentioned, that Blasius also supposed the vasa deferentia of the *drake* terminated in the penis, although he spoke doubtingly, not having actually traced them thither. See Anatome animalium Gerardi Blasii.

In the *gander*, *swan*, *cassowary*, and other birds which we have examined, the channel that runs upon the external part of the penis supplies the place of the urethra, and appears fully competent to answer the purpose of a conduit to the semen, when it is introduced into the organs of the female.

Besides the mucous follicles surrounding the termination of the ureters and seminal ducts, there are some others much larger upon the margin of the anus, on each side of the base of the penis. In the *gander* we have noticed twelve of these, six on each side. They appear like masses of fat lying under the inner membrane of the intestine. The three outer glands have wide orifices which lead to a cavity within of some size; they furnish specimens of simple mucous follicles, a greater size than are almost ever met with, even amongst the largest animals. See *Plate* VII. in the *Anatomy of Birds, fig.* 3. *eee* the large follicular glands on the margin of the anus of the *gander; fff* the three smaller glands next the penis. The anal glands are very remarkable in the *cassowary*.

No chemical analysis of the semen of birds has yet been attempted. The undertaking will be attended with some difficulty, from the small quantity which can be collected for investigation.

Female Parts of Generation.

There are no parts of the structure of birds which deviate, more from that of mammalia, than the female organs of generation: not only their construction, but their functions, differ so much, that the same names cannot be applied to each, without extending analogy beyond what is justifiable. The genital organs of the female bird strictly consist but of two parts, an *ovary* and *ovarian tube;* for the different portions of the latter, which have received the names of *uterus* and *vagina*, perform very different functions from the same parts in other animals.

The *ovary* of birds is always single, which is a peculiarity of structure hardly ever met with in the other classes of animals. It is situated over the descending aorta, above the kidnies. Instead of the ova being imbedded in a solid mass, as in mammalia, they are contained in membranous cysts, which are prolonged into peduncles, or footstalks, that are attached to the basis of the ovary, thus presenting the appearance of a cluster, or bunch of fruit, from whence the older anatomists were in the habit of calling the ovary of birds, the *racemus vitellorum*. Before the ovary, however, is developed, the rudiments of the eggs do not project beyond the surface, but lie in close contact with each other, and are inclosed by the external membrane of the ovary, something in the manner of the ova of fish, or amphibia. The capsules which invest the ova of birds in the mature state, appear therefore to be formed by the extension of the outer membrane of the ovary, just as the contents of a hernia obtain during their protrusion a covering of peritoneum. The membranous bags, in which the ova are included, adhere to the proper tunic of the egg at the anterior part only; for posteriorly they are quite distinct, being prolonged into a funnel, or tube, which forms the peduncle to each ovum. The blood-vessels are transmitted through this funnel, and ramify in the space left between the capsule and the back part of the ovum, distributing their branches in a similar way to the central artery of the eye upon the back of the crystalline lens in mammalia. The capsules are extremely vascular at every part, except a certain portion of the anterior surface, which appears like a white streak, or broad line. When the eruption of the ovum takes place, this part of the capsule gives way, after which the cyst appears like the cup of an acorn, when the nut has been shed. The older anatomists almost universally believed that the capsules of the ova were imperfect at their anterior part, and that the white streak was owing to the proper tunic of the ovum being actually exposed at this place; they describe the capsule as being extended upon the ova in a manner similar to the internal coats of the eye, and, like them, terminating by a defined line at the anterior part. The celebrated Harvey, however, observed that the membrane composing the capsules was continued over the anterior part of the ovum, at which place it became very thin. The observations we have made on this subject confirm the assertion of Harvey; we have always been able to detect a very fine pellucid membrane extended over the white line, which has all the appearance of being the continuation of the capsule. The coat of the capsule consists of several indistinct layers; and it is one of these only which appears to pass over the white line. The separation of the tunic of the capsules into layers is probably not an original formation, but is produced by the increase which takes place in the number and size of the blood vessels, and therefore the part which lies over the white streak might be considered as more nearly resembling the membrane of the capsule as it first existed. There are many instances of parts, on changing their position, either acquiring or losing vascularity, and becoming so much altered in their structure and appearance, that separately they could not be recognized for the same. The tunica conjunctiva of the eye affords a well known example of this sort.

The portion of the capsule corresponding to the white line, from being bereft of blood-vessels, becomes thin, is easily ruptured, and is incapable of supporting any internal actions, in consequence of injury; we accordingly find, that this part suffers laceration when the ovum is shed, without the least inflammation succeeding, or any process similar to that which arises upon the rupture of the ovary in mammalia. There is no deposition of new substance in the cavity of the cyst, or *corpus luteum*, formed. The lacerated portions of the membrane disappear (probably by absorption), and the edges assume the appearance of being cut, the capsules become contracted and thickened, and remain hollow, presenting very exactly the resemblance of cups or the calyces of flowers, and thence they have been often called the *calyces*.

The base of the ovary, in which all the pedicles of the ova terminate, is of a peculiar texture. It is porous and tough, and seems to be composed of an intermixture of vessels and strong cellular substance; it adheres firmly to the parts upon which it is placed.

The *ova*, during the time they remain in the ovary, possess only the yolk and the cicatricula; the whites and the shell being added to them during their passage through the oviduct. Many of the blood-vessels which are distributed between the capsule and the ovum, penetrate the membrane of the latter, in order to supply blood for the nutrition of the egg during its growth. But when the ovum arrives at maturity, these branches degenerate, and disappear entirely before the ovum is expelled from its cyst.

For the illustration of the structure of these parts, see

Plate

Plate VII. of the *Anatomy of Birds*. *Fig.* 5. exhibits the genital organs of the *hen* during the feason for laying eggs; at the superior part is seen the *ovary*, or *racemus ovorum*, or *vitellarium*. The ova are arranged according to their state of growth. The largest are most external and pendent from their footstalks; those less advanced are close upon the matrix or basis of the ovary; many of them are as yet but imperfect rudiments of the ova, and appear but as white specks in the matrix. The capsules of the ova, near maturity, display a very beautiful and luxuriant distribution of blood-vessels upon every part of their surface, except where the ova are to come out; *a a* point out the stripe on the anterior part of each capsule, which is devoid of blood vessels; *b* a capsule which has shed its ovum, exhibiting the appearance of a cup or calyx.

The *ovarian tube*, or *oviduct*, during the feason of laying, fills the greater part of the lower belly; it forms a number of curves or convolutions similar to the intestines, which, however, are not permitted the same latitude of motion amongst each other, because the prolongation of peritoneum, which includes the oviduct, is remarkably strong, and is not so long as the parts it contains, and therefore the convolutions are coiled close together, and even some of them are doubled up within the peritoneum. The disproportion between the oviduct and peritoneum, which invests it, arises from the additional bulk the ovary acquires when its functions are exercised, whilst the peritoneum must preserve at its back part its original extent, i. e. the length of the left kidney, from the middle of which it is reflected.

There is no decided muscular coat belonging to the oviduct; there are, however, muscular fibres between the peritoneal and internal coats of those parts, which have received the names of uterus and vagina; upon the former they are transverse, and upon the vagina the course of the fibres appears to be longitudinal.

The internal coat of the oviduct is the most remarkable part of its structure; and upon it chiefly depends the distinctions which have been made of the tube into *infundibulum*, *Fallopian tube*, *uterus*, and *vagina*.

The *infundibulum* is the extreme part of the tube next the ovary; it is composed apparently of a single thin membrane; the peritoneum and the internal tunic becoming both delicately fine, and so closely united to each other, at this place, that they seem to be but one. This membrane is expanded beneath the ovary in a loose manner, like the folds of a garment, and is fastened by its superior edge to the basis or matrix of the ovary; and inferiorly it is connected to the uterus: by which means the folds of the membrane are always kept spread out, ready to catch the ova as they are discharged from the racemus or vitellarium. The passage from the membranous expansion of the tube into the oviduct is contracted, and thence occurs the similitude of this part to a funnel, and the application of the term *infundibulum*.

The next portion of the oviduct, or *Fallopian tube*, is of considerable length, being several times coiled backwards and forwards upon itself. It is very nearly of the same width at every part; and the inner membrane is singularly soft, and forms numerous thick folds, which take an oblique or spiral course. The internal surface of this part of the tube resembles very much that of the digestive stomach in ruminating animals.

Where the part termed the *uterus* commences, there is a contraction of the tube, to which succeeds a dilatation of an oval or egg shape; in this the internal membrane acquires more firmness, and instead of the soft white spiral plicæ, produces an immense number of strong vascular processes or flocculi, which give the internal part of the uterus the appearance of being fringed or foliated.

The tube again becomes diminished in capacity, and its structure changed, to form the portion considered analogous to the *vagina*. At the origin of this part from the oval dilatation there are several annular contractions; after which, the canal undergoes some degree of convolution, which is concealed by the peritoneal coat. The internal membrane produces longitudinal rugæ, or folds, which do not project far into the cavity of the tube.

The oviduct finally opens into the cloaca on the left side, not by a simple aperture, but the extremity of the vagina is protruded for some way into the cavity of the intestine, appearing as if a portion of the oviduct were turned inside out; and to the puckered foramen thus produced, the older anatomists, who were always desirous of comparing the structure of other animals with that of the human subject, gave the name of *valva*. See *Plate* VII. in the *Anatomy of Birds*, *fig.* 5.; *c c c* the membranous expansion of the oviduct, *d d* its attachments to the ovary and the uterus, *e* the aperture leading from the infundibulum to the interior of the oviduct; *f f f f f* the convoluted part of the oviduct, which is supposed to be analogous to the Fallopian tube, and a part of it laid open to exhibit the spiral folds of the internal membrane; *h h* the oval cavity or uterus cut open, and a portion of it turned backward to expose the foliated structure of the internal membrane; *i i* the vagina detached in a degree from its peritoneal covering to bring it more into view; *k* the cavity exposed, shewing the longitudinal folds; *l* the projection of the end of the oviduct into the cloaca, with the corrugated foramen by which it opens into the gut; *m* a portion of the rectum, left to explain the connection these parts have to each other; *n n* the ureters, through which a bristle is introduced.

The uses which the several parts of the oviduct of birds serve, are very peculiar, and can hardly be compared with the functions of the genital organs of other animals. When the ovum is shed from the vitellarium, it is but imperfectly formed; and in passing along that portion of the oviduct which has been called the Fallopian tube, it meets with an albuminous fluid, which is secreted in abundance from the plicated membrane; a certain quantity of this fluid attaches itself to the ovum, and constitutes the whites and the chalazes. The egg now assumes an oval figure, and while still soft, descends into the dilated part of the oviduct, in which it is detained for some time, and obtains the calcareous covering or shell; after which, the lower portion of the duct, or the vagina, suffers itself to be enlarged, and the egg is expelled from the body of the bird. For the further history of the formation of the ovum, we refer the reader to the article EGG. In birds, and all animals strictly oviparous, the evolution of the embryo, and the growth of the fœtus, is carried on without the body of the parent, and therefore the functions of the organs of generation in these animals are confined to the developement and perfection of the ovum, which, as already observed, is partly accomplished in birds, while the egg remains in the ovary, and partly while it traverses the ovarian tube. It therefore seems improper to borrow the terms applied to the organs of viviparous animals in the description of those which only minister to the formation and support of the ova. The progress of the fœtus in birds; its mode of existence while in the egg, and the provisions for its subsistence afterwards, will be treated of under the head of INCUBATION, which see.

It is not easy to determine how far the male semen is conveyed into the organs of birds during copulation. The older anatomists asserted, that the two papillæ on which the vasa deferentia

deferentia terminate, were introduced into the orifice of the oviduct within the cloaca; and it has been obſerved, that the hen, before coition, everts the inteſtine ſo much, that the orifice of the vagina is viſible on the outſide of the body, which would render the inſertion of the male organ very practicable, eſpecially in thoſe birds which are provided with a penis. The impregnating liquor muſt be tranſmitted as far at leaſt as the part in which the egg is clothed with the ſhell; for afterwards it would be incapable of exerting any influence upon it; and it is probable that it reaches the ovum even before it acquires the whites, otherwiſe the ſtimulus could not be immediately communicated to the *cicatricula*. Many have ſuppoſed, that the ſemen produced a vapour which was propagated to the ovary itſelf; but the exiſtence and operation of the *aura ſeminalis* are now generally diſbelieved.

Upon the margin of the anus of birds there is uſually obſerved a projection which has been conſidered analogous to *clitoris*. The academicians obſerved, that it poſſeſſed in the *female oſtrich* the ſame muſcles which belonged to the penis. This part, from its ſituation, is little expoſed to agitation or friction in venereal congreſs, and from its covering, which is the common integument of the anus, cannot be endowed with peculiar or delicate ſenſation. It may therefore be looked upon as one of the examples of uniformity of plan which are ſo often diſplayed in the works of nature, without the accompliſhment of any immediate or obvious effect.

The female organs of generation of birds ſuffer even a greater alteration than the male parts, in conſequence of the ceſſation of their functions. Before and after the period of laying has commenced, the ovary and oviduct, which in their developed condition are the largeſt of the viſcera, are ſo diminutive, that they are hardly to be ſeen; the ovary is a very ſmall maſs, which appears to be compoſed of an aggregation of minute pale yellow grains; the oviduct is a mere membranous ſubſtance, with ſcarcely any cavity, like a degenerated blood-veſſel; and the aperture, which at one period permits the egg to paſs through it, is ſo nearly obliterated, that it is perceived with difficulty, and is ſo cloſe that it does not ſuffer the ſmalleſt inſtrument, or even air, to eſcape from it into the inteſtine.

Mr. Hunter, and others, have obſerved, that even the ſexual characters of ſome female birds have entirely changed, after the time they ceaſed to lay. This phenomenon has been remarked moſt frequently in the *pea fowl*. Several hens of this genus have aſſumed the manners and plumage of the cock ſo nearly, that their real ſex could only be decided by anatomical inſpection.

Organs subservient to the Performance of the Animal Functions.

Bones.

The oſſeous fabric of the bodies of birds conſtitutes one of the moſt curious and characteriſtic parts in the anatomy of this claſs of animals; being in many reſpects ſo curiouſly formed, that the analogy between them and the ſame organs of other animals can ſcarcely be traced.

The bones of birds have been obſerved to vary in their colour. The water birds have them of a duller white than the other ſpecies, in conſequence of their abounding with marrow. The bones which contain air, are always of the fineſt colour, much exceeding in whiteneſs the bones of any quadruped: they are alſo of a harder and cloſer texture. Beemann, in the voyage of Dampier, has obſerved that the *black fowl* of the iſles of Cape-Verd, and other birds of theſe iſlands, had black bones, and Daubenton reared ſome hens of this kind. The ſame peculiarity has been noticed in the *pintado*; but ſome preparations, which were preſerved by Mr. Hunter to illuſtrate this ſubject, ſhew that it is the perioſteum in which the blackneſs reſides.

The chemical principles of the bones of birds, do not differ from thoſe of mammalia, except in there being a greater proportion of the calcareous phoſphat in the long bones, filled with air. The arrangement of the oſſeous particles appears to be in layers, rather than fibres, ſucceſſively formed, and cloſely applied to each other.

The *bones of the head*, as in the other animals with vertebræ, conſiſt of theſe of the *cranium*, or brain-caſe; and thoſe which contain the organs of ſenſe, or, as they are commonly termed, bones of the *face*.

The *external form of the cranium* differs according to the ſpecies: a longitudinal and vertical ſection of it uſually exhibits the cavity to be ſomewhat of an ovular ſhape, of which the end next the face is rather pointed. In the *owl*, the cavity of the cranium is an oval, with the axis nearly vertical. The ſame bones enter into the compoſition of the cranium in birds, as in mammalia; but the ſutures are obliterated at ſo early an age in the former, that their cranium commonly appears as a ſingle bone, and therefore, in order to examine the bones of the head ſeparately, a very young ſubject muſt be choſen.

The *os frontis* is originally made of two portions: they form the principal parts of the roof of the orbits, and a portion of the ſeptum, which divides one orbit from the other. They ſend down, on each ſide, a pointed proceſs, almoſt to the baſe of the bill. The prominences which are ſeen upon the heads of the *caſſowary*, *hornbill*, *pintado*, and the *curaſſow*, *&c.* are attached to the os frontis, but were originally formed by diſtinct oſſifications, in the ſame manner as the bones on the tarſus, which ſerve as the mould for the *ſpurs*. The caſque of the *caſſowary*'s head is filled with numerous cells: in the *pintado*, the texture is more like that of the other bones.

The *parietal* bones are alſo in two pieces at one period, although the diſtinction is but rarely ſeen. They reſemble two ſemi-ſpheres, hollowed out on the inſide, to receive the brain.

The *temporal* bones compoſe the poſterior parts of the orbits, and exhibit a remarkable depreſſion between two projecting proceſſes, for lodging the muſcles employed in the motions of the lower jaw. The zygoma is not joined to the temporal bone.

The *occipital* bone originally conſiſts of four portions; one placed ſuperiorly, another below, and two laterally. When theſe are united, the bone has an annular figure, incircling the foramen magnum. The ſurface by which it articulates with the firſt cervical vertebræ, is a ſingle ſpherical protuberance, which is placed upon the anterior edge of the great foramen, and is received into a correſponding depreſſion of the atlas. The mobility of the head is much encreaſed by this mode of articulation.

The *ſphenoidal* bone forms the greater part of the baſe of the cranium, its proceſſes are leſs evident in general, than in mammalia, although it furniſhes a remarkable one which proceeds anteriorly like a ſtilet, and receives upon its edge the ends of the inter-articular bones, and the palatine bones and vomer, which are each adapted to ſit this proceſs, and to ſlip along it, as the upper jaw is moved. The ſphenoid bone wants the pterygoid proceſſes, theſe belonging to the palatine bones in birds.

The *internal ſurface of the cranium* exhibits a ſharp ridge, which divides the cavity into two principal foſſæ. The one contains the hemiſpheres of the cerebrum, the other, which is ſituated in the poſterior and inferior part of the cranium, accom-

accommodates the two thalami nervorum opticorum, the cerebellum, and medulla oblongata, &c. On the furface of the fuperior foffa there are two flight projections, produced by the back of the orbits, and a fmall fpinous ridge along the top of the cranium, which marks the diviſion of the hemifpheres; the inferior foffa difplays a number of depreffions, correfponding to the feveral parts it contains. There are alfo two irregular projections on the fide, formed by the internal organ of hearing, and anteriorly the eminence called the *fella turcica*, is to be feen, with a deep round cell for lodging the pituitary gland. The depreffions on the internal part of the cranium are deepeft in the *parrot* and *accipitrine* birds.

The *foramina of the cranium* vary in many refpects from what occurs in mammalia.

The foramina through which the olfactory nerves are tranfmitted are only two in number; they proceed from a little depreffion at the anterior part of the fkull, and open upon the upper and poiterior furface of the orbit, along the fuperior part of which they are continued, as a deep groove, or rather more than a femi-canal, to the upper and back part of the nofe, where there is another foramen or flit, formed by the ethmoidal bone.

The *optic foramina* arife clofe together on the infide of the cranium, being only feparated from each other by the thin partition of the orbits; this is frequently found deficient at the poiterior part, and in that cafe the two optic foramina are thrown into one.

The *fpheno-orbitar* fiffure does not exift in birds. The parts which are tranfmitted through it in mammalia, pafs by diftinct holes: fome of thefe are arranged round the optic foramina, and one is found on the bafis of the fkull.

The *foramen rotundum* and *foramen ovale*, are fupplied by a fingle hole. It is feen on the line dividing the optic and bafilar foffæ.

The *canalis carotideus* appears to commence far back, on the outfide of the cranium, and juft as it turns up to open upon the fella turcica, there is a fmall foramen for the tranfmiffion of the communicating branch of the internal maxillary artery.

The *foramen lacerum anterius* does not exift, and the *poftefior foramen lacerum* is fmall, and placed within and under the external meatus auditorius.

The *meatus auditorius internus* is a very palpable foramen in birds.

The *bones of the face* in birds, although they differ extremely in form from thofe of mammalia, ftill preferve in general a diftant analogy, by which they can be diftinguifhed and compared.

The *feptum* of the orbits, notwithftanding its ftructure is fo diffimilar, muft be confidered as analogous to the *ethmoid bone*. It is united to the os frontis fuperiorly, and to the fphenoidal bone below; it is at beft but a lamina, or plate of bone, fo thin that it is nearly tranfparent, and in numerous inftances is in part membranous. At the back of the organ of fmell there is occafionally a procefs which projects a little from the feptum, and then turns down forming a flit, through which the olfactory nerve paffes. This procefs may be compared to the *os planum*, and the feptum itfelf, although it is not continued far into the nofe, may perhaps be thought analogous to the *nafal lamella* of the ethmoid bone.

There is a bone ufually of a triangular fhape, which is attached to the anterior, and outer angle of the os frontis. This bone Cuvier has called the *lacrymal*, and others the *fuperciliary*. It is in a certain degree moveable on the os frontis. Its two poftefior angles form the fuperciliary or anterior edge of the orbits. The fuperior of them is continued farther backwards in the *diurnal birds of prey* than others, giving a confiderable prominence to the upper edge of the orbit. In the *oftrich*, the fuperciliary arch is made of a number of fmall bones, which are continued from the lacrymal bone, and are diftinct from the os frontis. The lower of the poftefior angles of the lacrymal bone is prolonged confiderably in the *duck*, but much more in the *parrot*, in which it goes fo far back as to join the projection of the temporal bones, and thus completes the frame of the orbit.

The remaining bones of the face either enter into the compofition of the mandibles, or are provided for the motion of thefe parts. The fuperior mandible is made up of the *offa nafi*, *offa maxillaria*, and *inter-maxillaria*, the *vomer*, the *malar*, and *palatine* bones; the extremity of the mandible appears to be formed originally by a diftinct bone, which is added, as it were, to all the reft. The feparate parts of the mandible are not to be diftinguifhed in the adult bird, but in young fubjects they come eafily afunder.

The *palatine* bones are fo thin at their connection with the poftefior part of the mandible, that they readily bend. At the back part, they fpread out into two wings or the *pterygoid procefles*, leaving a flit-fhaped aperture for the poftefior nares, in which is feen the vomer; where the palatine bones are joined above, there is a groove or gutter formed, which receives the inferior edge of the feptum of the orbits, and on which the palatine bones have a degree of motion when the upper mandible is raifed.

The *zygoma* is one of the moft remarkable parts of the head of birds. It is a very long delicate bone, extended in a ftraight line from the inferior and back part of the upper mandible to the outfide of the articular bone immediately above the articulation of the lower jaw. It is, as in mammalia, originally compofed of two pieces, which in large birds are always vifible. The anterior portion has been commonly defcribed as a procefs of the palatine bones, but it is really produced from the part of the mandible that correfponds to the *os malæ* or *jugale*, as it ought, in order to be conftftent with analogy. The junction of the zygoma to the articular bone, is in a degree moveable; this, added to its general flendernefs and flexibility, allows it to yield to all the motions of the fuperior mandible.

There are two bones belonging to the head of birds, to which there are none analogous in mammalia. One of thefe has been called by Dumeril the *fquare bone*, but improperly, as it is in no inftance exactly fquare, and when its procefles are eminent, it is rather of a triangular form. We have chofen, both from its office and fituation, to call it the *articular* bone.

This bone is interpofed between the articulation of the lower jaw, and the os temporis: with both of thefe it produces a true joint. The articular furface it prefents to the temporal bone, is like the two condyles of the occiput of mammalia, and between thefe the end of the bone contributes to the formation of the cavity of the tympanum. The articular furface next the lower jaw is made of two irregular eminences, placed obliquely acrofs, forming a double pulley. On the outfide of this the temporal extremity of the zygoma is attached, and on the infide there is articulated another flender bone, which, from its fituation, deferves to be named the *inter-articular bone*. There is a procefs from the anterior part of the articular bone, which paffes up into the orbit, and receives the attachments of mufcles.

The *inter-articular bone* is connected by a moveable joint to the articular. It is a fmall, ftraight, three-fided bone, flightly

ſlightly enlarged at the extremities. It is directed forwards and inwards, and at the anterior extremity touches the inter-articular bone of the oppoſite ſide: at this place the ends of both are placed againſt the poſterior extremity of the palatine bones, and are hollowed ſo as to encompaſs the lower edge of the ſeptum of the orbits, along which they have ſome degree of motion, when urged forwards by the articular bones.

The effect of this mechaniſm is, that whenever the inferior end of the articular bone is brought forwards, which is accompliſhed in a degree by the opening of the lower jaw, but ſtill more by particular muſcles, to be hereafter deſcribed, the inter-articular bones preſs againſt the extremity of the palatine bones, and they communicate the impulſe to the whole ſuperior mandible, which being very thin at its junction with the os frontis, ſuffers itſelf to be puſhed up or elevated from the line it commonly holds, and in this manner the mouth of birds is dilated in part by the motion of the upper as well as the lower jaw.

The *parrot* is remarkable for having a great degree of motion in the upper mandible; in this bird the ſuperior mandible is at all times ſeparate from the frontal bone, they being only connected to each other by a very flexible ligament.

The *inferior mandible* appears to be formed originally of four pieces; two of theſe correſpond with the bones of the inferior maxilla, and the others produce the mould on which the lower part of the bill grows. The formation of the inferior jaw, independent of its connection with the bill, differs very much from that of mammalia. There are no *condyles*, nor any proceſs deſerving the name of *coronoid*, and the angle of the jaw is the thickeſt and loweſt part of it. The articulation is made by two depreſſed ſurfaces placed on the ſide of a cavity, into which the poſterior pulley of the articular bone ſlips in the motions of the jaw.

The form of the bones of the mandibles is preciſely the ſame of the horney bill, with which they are covered; except in ſome *water birds*, the bill aſſumes more or leſs of a conic figure; ſometimes compreſſed, ſometimes arched, in ſome caſes elongated, in others ſhort, and varying in the degree of ſharpneſs, ſtrength, and ſolidity. As the diverſity, however, which occurs in the mandibles of birds, is an external appearance, and belongs rather to the ſcience of natural hiſtory, than to comparative anatomy, it would be improper to diſcuſs the ſubject in the preſent article.

The peculiarities of the *foſſæ* and *foramina of the face* in birds, depend chiefly upon the form and proportions of the bones.

The *orbitar* foſſæ are ſo large, that they appear to occupy the greateſt part of the profile of the head of birds. They extend in the ſkeleton from the roof of the ſkull to the palate, and communicate with the poſterior part of the organ of ſmell. Cuvier very aptly compares them to the impreſſion which one would conceive might be left by pinching the ſkull between two fingers, provided it were in a ſoft ſtate.

The *naſal foſſæ* are continuous with the orbitar. They open upwards by the two external nares, or noſtrils, and below by the poſterior nares. The ſeptum naſi proceeds ſo ſhort a way in the noſe, that the naſal foſſæ make but one cavity. The external apertures of the nares are found in the bone, at the baſe of the convex ſurface of the bill.

The *temporal foſſæ* are not croſſed by the zygoma. They vary in depth according to the ſtrength of the muſcles employed in raiſing the lower jaw; they are therefore moſt plain in the rapacious birds, and thoſe with long or heavy bills.

The *ſpheno-maxillary fiſſure* can have no exiſtence in birds from the figure and extent of their orbits; neither have they the *internal orbitar*, and *ſub-orbitar foramina*, or the *ſpheno-palatine* canal.

The *inciſive* foramina are ſmall and numerous in the *heron*, *flamingo*, *eagle*, &c. There is but one of a moderate ſize placed near the baſe of the bill in the *duck*, the *curaſſow*, the *cormorant*, and the *ſpoon-bill*, &c. In the *caſſowary*, the foramen inciſivum is ſmall, and near the end of the mandible, but in the *oſtrich* it is of great ſize. The *ſtork* has a long ſlit, into which open an immenſe number of minute holes.

The *os hyoides* poſſeſſes a ſingular conformation in birds. The body of the bone is in general of a ſhort round figure, ſomewhat enlarged at its poſterior extremity, at which place it is articulated with the two *cornua*. Theſe reſemble horns exactly, both in their ſhape and direction; they are terminated by additional pieces, which form a ſort of joint with the principal part of the horn, and generally conſiſt entirely of cartilage. To the poſterior end of the body or middle bone of the hyoides, there is articulated a ſmall ſtyloid or dagger-ſhaped bone, which proceeds directly backwards, and ſoon terminates in a point. There is alſo a bone articulated with the anterior extremity of the body of the hyoides, which penetrates the ſubſtance of the tongue, and partakes in a certain degree of the form of that organ: it is commonly terminated by a pointed cartilage, which is attached to it by a moveable joint, and is continued to near the tip of the tongue. This bone we ſhould chooſe to call the *lingual*.

The os hyoides and lingual bone are ſingularly formed in thoſe birds which have the power of protruding their tongue to take their food. In the *woodpeckers*, for inſtance, the cartilaginous extremities of the horns of the hyoides are immenſely long, and when the tongue is not projected, are lodged in a groove or furrow, which runs over the whole head, and terminates only at the root of the bill. The lingual bone in theſe birds alſo is not cartilaginous at its extremity, but is covered with a hard or horny ſubſtance, which protrudes beyond the ſoft parts of the tongue for the diſtance of about the quarter of an inch, ending in a point, and furniſhed with a number of ſharp barbs, or ſpiculæ, which are moveable in the poſterior direction only; ſo that, like the teeth of ſome fiſh, they ſuffer the inſects on which the bird preys to be eaſily perforated by the end of this inſtrument, but render it impoſſible for them afterwards to retreat.

The vertebræ of the different regions of the ſpine of birds do not bear the ſame proportion to each other with reſpect to number that is uſual in other animals. The cervical portion in this claſs is generally compoſed of a much greater number of vertebræ than any other diviſion of the ſpine. The length of the neck is in moſt birds determined by the height of the legs. Thoſe *water birds*, however, which procure their ſubſiſtence by fiſhing, are provided with long necks, and at the ſame time ſhort limbs, as in the *cormorant*, *divers*, &c. The dorſal vertebræ are uſually leſs numerous than in quadrupeds. The vertebræ of the loins become anchyloſed with the bones of the pelvis, and with each other at an early period, and conſequently it is difficult to reckon them. The caudal vertebræ are moſt numerous in thoſe birds which make the greateſt uſe of the tail, ſuch as the *ſwallow*, *woodpecker*, *oſtrich*, &c.

The following table, which is extracted from Cuvier's Lectures on Comparative Anatomy, exhibits the variety which exiſts with reſpect to the number of the vertebræ in many ſpecies.

TABLE

TABLE of the Number of the Vertebræ in Birds.

SPECIES.	Ver. of the neck	Ver. of the back.	Ver. of the sacrum.	Ver. of the coccygis.
Vulture	13	7	11	7
Eagle	13	8	11	8
Bald-Buzzard	14	8	11	7
Sparrow-Hawk	11	8	11	8
Common-Buzzard	11	7	10	8
Kite	12	8	11	8
Great-Horned-Owl	13	7	12	8
Common-Owl	11	8	11	8
Fly-Catcher	10	8	10	8
Black-bird	11	8	10	7
Tanager	10	8	9	8
Crow	13	8	13	7
Magpie	13	8	13	8
Jay	12	7	11	8
Starling	10	8	10	9
Grofs-beak	10	7	12	7
Bullfinch	10	6	11	6
Sparrow	9	9	10	
Gold-finch	11	8	11	8
Titmouse	11	8	11	7
Lark	11	9	10	7
Red-breaft	10	8	10	8
Swallow	11	8	11	9
Goat-fucker	11	8	11	8
Humming-bird	12	9	9	8
Hoopoe	12	7	10	7
King's-fifher	12	7	8	7
Wood-pecker	12	8	10	9
Toucan	12	8	12	more than 7
Parrot	11	9	11	8
[illegible]	13	–	13	7
Peacock	14	7	12	8
Pheafant	13	7	15	5
Turkey	15	7	10	5
Curaffow Bird	15	8	10	7
Oftrich	18	8	20	9
Caffowary	15	11	19	7
Flamingo	18	7	12	7
Heron	18	7	10	7
Stork	19	7	11	8
Crane	19	9	12	7
Spoonbill	17	7	14	8
Avofet	14	9	10	8
Plover	15	8	10	7
Lapwing	14	8	10	7
Woodcock	18	7	13	8
Curlew	13	8	10	8
Oyfter-catcher	12	9	15	
Rail	13	8	13	8
Coot	15	9	7	8
Jacana	14	8	12?	7
Pelican	16	7	14	7
Cormorant	16	9	14	8
Sea-fwallow	14	8	10	8
Gull	12	8	11	6
Petrel	14	8	??	9
Swan	23	11	14	8
Goofe	15	10	14	7
Barnacle	18	10	14	9
Duck	14	8	15	8
Sheldrake	16	11	11	9
Scoter, or Black Diver	1[illegible]	9	14	7
Merganfer	15	8	13	7
Grebe	14	10	13	7

The *cervical vertebræ* are joined to each other by a mode of articulation which admits of very free motion in two directions;—laterally, and backwards or forwards. This depends upon the form of the articular furfaces of the bodies of the vertebræ, which confift of two portions of a cylinder applied crofsways with refpect to each other, and both a little hollowed for their mutual accommodation. The cylinder on the inferior part of the vertebræ, performs by its revolution the motion to either fide; and when that of the fuperior part revolves, the neck is bent either backwards or forwards. The cylinders at the top of the neck admit of motion forwards; but thofe of the middle and inferior part of the cervical fpine are incapable of performing a free motion forwards; as one contains a flight depreffion on its anterior part, which receives the edge of the other. The neck of birds, therefore, poffeffes in the contracted ftate, or when at reft, fomewhat of the figure of an S. which is accompanied with feveral advantages to thefe animals. They are enabled by it to throw the weight of the neck and the head more over their centre of gravity, without which fome fpecies would be unable to preferve their equilibrium; and by combining the S like motion with that to each fide, birds acquire a greater degree of flexibility in the neck than is poffeffed by other animals; they can touch every point of their own body with the bill, and thus fupply the want of the prehenfile faculty of the fuperior extremity or the tail, of which they are deprived by their peculiar mode of progreffion.

The furfaces of the articular proceffes lie nearly in the direction of the bodies of the vertebræ, but in fome parts have a degree of obliquity conformable to the S like fhape of the neck.

The fpinous proceffes are only to be obferved on the fuperior and inferior portions of the cervical fpine, where they exift both on the anterior and pofterior parts of the vertebræ. In birds with long necks there is a foffa on each fide of the pofterior fpinous proceffes, for the attachment of the cervical ligament, or *ligamentum nuchæ*. This fubftance is to be obferved perhaps in all birds, but is very remarkable in the *ftork*, *fwan*, *caffowary* and *oftrich*. In the laft bird it is nearly as ftrong as it exifts in the larger quadrupeds: the fame kind of ligament is alfo interpofed between the fpinous proceffes of the dorfal vertebræ.

The tranfverfe proceffes of the vertebræ of the middle of the neck fpread forwards, and fend down a ftyloid procefs of fome length. Thefe give attachment to mufcles, and form in fome birds a fort of canal on the anterior part of the neck, which contains the two carotid arteries. The anterior ftyloid proceffes are little obfervable in the *rapacious* and *pafferine* tribes, the *parrot*, *&c.*; but are ufually very marked in the long-necked birds.

The *dorfal vertebræ* of birds have fcarcely any motion, in order

order that the trunk of the body may not be affected by the motions of the wings in flight.

Their spinous processes are commonly anchylosed with each other, which sometimes occurs also with respect to the transverse processes. In the *ostrich* and *cassowary*, the processes of the dorsal vertebræ are distinct, and possess a degree of motion from which, however, these birds cannot suffer any inconvenience, as they do not fly.

The *caudal vertebræ* have spinous processes on both the anterior and posterior surfaces; and the transverse processes are usually very prominent. The last bone of the tail, is, in most birds, of a plough-share shape for the attachment of the quills. It is small and conic in the *new holland ostrich*, and *cassowary*; and in the *peacock*, it is thin, oval, and situated horizontally. It is wanting in a variety of the domestic cock found in America.

The *sternum* forms one of the most characteristic bones in the skeleton of birds. It is a very broad thin bone, covers the anterior part of the common cavity, like a buckler, and produces from its middle line, in every bird which is capable of flying, a thin plate of bone, which resembles very much the keel of a ship; but it is most prominent at its anterior part. The upper edge of the sternum presents two narrow depressions, which receive the ends of the two clavicles; and to the most anterior point of the keel the fork-shaped bone is commonly attached. The posterior edge is thin, and in most species, contains a space on each side, which is filled with membranes. In the *accipitres*, *parrot*, and most *aquatic* birds, this is an oval hole; but in the *gallinæ* it is an oblong vacancy. The keel appears to be added to the sternum, merely for the attachment of the great pectoral muscle. Accordingly, we find its projection is proportioned to the necessity there is for using this muscle during flight; and in the *ostrich* and *cassowary*, which do not employ their wings as organs of locomotion, the keel is absent, and the sternum is round and smooth on the external surface, and is very small in proportion to the magnitude of these birds.

The *ribs* of birds have been divided, like those of mammalia, into true and false, or as Vic d'azir has termed them the *sterno-vertebral* and *vertebral*. The true ribs are made of two pieces, which are each composed of bone: the posterior portion is affixed to the spine by means of two branches, of which one is articulated with the body, and the other with the transverse process of the same dorsal vertebra. The anterior piece is articulated by one end, with the lateral edge of the sternum; and by the other, to the end of the vertebral portion. The sternal extremities of the ribs, being distinct bones, deserve to be called *sternal ribs*, which term we have employed in other parts of this article. Most of the true ribs are furnished about their middle, with a thin osseous process, which proceeds obliquely backwards from the posterior edge of one rib, and over-laps the one next behind it, and sometimes even goes on to cover two ribs, as in the *colymbus cristatus*. The sternal and vertebral portions of the true ribs form, at their junction, an angle which points backwards, and is very acute in the first ribs, which proves that the thorax of birds is chiefly dilated by the anterior part of the sternum, being carried forwards from the dorsal spine; at which time, the moveable angles of all the ribs become very obtuse. These angles are scarcely observable in the *struthious* birds. Their ribs assume very much the figure of those of mammalia.

The number of the sterno-vertebral ribs is liable to vary. There are, on each side, four in the *cuckoo* and the *cassowary*; five in the *crow*, *african ostrich*, and *stork*; six in the *bittern*; seven in the *eagle*, the *buzzard*, the *owl*, the *crane*, and the *duck*; eight in the *crested grebe*, and several other water-fowl; and nine in the *swan*.

The *vertebral*, or *false ribs*, are in most birds placed at the anterior part of the thorax, which is the reverse of what is observed in mammalia. When there are any of these ribs situated posteriorly, they are only one or two pair, and imperfectly formed; there are two pair in the *struthious* birds, which do not project far from the spine.

The *bones of the pelvis* become consolidated together at a very early period. Their original parts are therefore very difficult to distinguish. The portion corresponding to the *os ilium* bears some resemblance to that bone in mammalia; but the ischium and pubis cannot be recognised by their figure, and are only to be known by their relation to the different foramina. There is a very long, slender bone, originally connected to the ilium, on the fore-part of the acetabulum, which supplies the place of the *pubis*. This bone runs parallel to the anterior part of the ischium, with which it is occasionally joined towards its extremity, but never unites with the bone of the opposite side, except in the *ostrich*, in which bird the bones of the pubis are broad at their symphisis, and stand a little forwards, producing something of the appearance of the pelvis of mammalia. The pubis unites with the ischium in the *accipitres* for a considerable way, and leaves a distinct hole analogous to the *foramen ovale*; and the space between these bones possesses in all birds, at the anterior part, the traces of this foramen.

The *ischium* is commonly united to the sacrum and back of the ilium, by the part which corresponds to the ischiadic *spine*; consequently the ischiadic foramen is complete in the skeleton of birds. In the *ostrich* and *cassowary*, however, the ischium is separate from the sacrum, and is a long, slender styloid bone, like the pubis. There is no tuberosity to the ischium, that part being thin and extended, except in the *ostrich*, where it becomes somewhat enlarged. The ischium appears to be joined to the pubis in the *new holland ostrich*, by the intervention of another short bone.

The *bones of the shoulder* are very peculiar in birds; besides the clavicles and scapulæ, there is an additional single bone, called the *fork*; it usually possesses the figure of a V; the point is attached to the most anterior part of the keel of the sternum, and the ends of the branches are secured by a ligament on the inside of the dorsal extremities of the clavicles, and also to the posterior process of the scapulæ, which is analogous to the acromion. The fork frequently approaches more to the figure of an U than a V. Its angle is also often at some distance from the sternum, to which it is bound by a ligament. In the *gallinæ* it terminates in a thin plate, from which a ligament is extended to the keel of the sternum. As a general observation, it may be stated, that the fork is strong and elastic, and its branches wide, arched, and carried forwards upon the body, in proportion as the bird possesses strength and rapidity of flight; and accordingly, the *struthious* birds, which are incapable of this mode of progression, have the fork very imperfectly formed. The two branches are very short, and never unite in the *african ostrich*, but are anchylosed with the scapulæ and clavicle. The *cassowary* has merely two little processes from the side of the clavicle which are the rudiments of the branches of the fork. In the *new holland ostrich*, there are two very small thin bones, which are attached to the anterior edge of the dorsal end of the clavicles, by ligament; they are directed upwards towards the neck, where they are fastened to each other

other by means of a ligament, and have no connection whatever with the ſternum.

The *clavicle* is a ſtraight bone in birds; it does not lie in a tranſverſe direction with reſpect to the trunk of the body, but proceeds upwards and forwards towards the lower part of the cervical ſpine; and in proportion to the length and projection of the clavicle, the bird poſſeſſes ſtrength of wing and activity of flight. The clavicle at its articulation with the ſternum is thin and broad; but the reſt of the bone is of a round ſhape: it produces a proceſs from the poſterior part of its dorſal extremity, which is united to the head of the ſcapula, and in conjunction with it forms a depreſſion analogous to the glenoid cavity, although not of the ſame figure. The inſide of the extreme part of the dorſal end of the bone, is joined by ligament with the branch of the fork, as already mentioned.

The clavicles of the *ſtruthiæ* are remarkably ſhort, and are anchyloſed with the ſcapulæ at leaſt.

The *ſcapulæ* are two long, plain bones, with ſharp edges, reſembling, in a great degree, the blade of a knife; they lie parallel to the dorſal ſpine, and have no proceſſes, except the one which contributes with the clavicle to form the cavity for lodging the head of the humerus; and a little eminence oppoſite to this, which ſeems analogous to the *acromion*, and is joined to the end of the branch of the fork. The ſcapulæ, like all the other bones of the ſhoulder, are very ſhort in the *ſtruthiæ*, not paſſing beyond the firſt two or three ribs: although in many other birds theſe bones reach as far as the pelvis.

The *humerus* is a round, ſmooth bone, more or leſs enlarged, and flattened at the extremities; the ſurface by which it articulates with the foſſa in the ſcapula and clavicle, is at the very end of the bone, and is formed of a portion of a cylinder, inſtead of a ſphere, which is moſt ſuitable to the motions of the humerus in birds, they being almoſt confined to the elevation and depreſſion of the wing. The external tuberoſity of the humerus is very ſmall; but the ſpine which leads from it is greatly elevated in moſt ſpecies of birds. The internal tuberoſity is, on the other hand, remarkably large, and furniſhes a proceſs at its upper part, which correſponds, in ſome reſpects, with the coracoid proceſs of the ſcapula in mammalia. The humerus is long, in proportion to the other bones of the wing in the *African oſtrich*, and takes the curvature of the bird's body. It is extremely ſhort and ſmall, and without proceſſes, in the *New Holland oſtrich*, and *caſſowary*.

The humerus is connected with the bones of the fore arm by an articular ſurface, ſimilar to that of the human ſubject.

The *radius* is uſually a much more ſlender bone than the ulna, with which it is never obſerved to be anchyloſed.

The *ulna* exhibits no remarkable proceſſes; it forms a pulley on its lower end. Theſe two bones are flat in the *manchot* (*apteroalyta*), and are joined by an articulation which permits motion in ſeveral directions, with two tubercles, one above, and the other below the anterior edge of the humerus. The wing of this bird, both in its ſtructure and offices, reſembles a fin. The ulna and radius are nearly of an equal ſize in the *ſtruthiæ*; they are both very ſmall, and have but little motion on the humerus.

There are but two *carpal* bones in birds; one is applied to the end of the radius, and prevents the motion of the lower part of the wing beyond the line of the radius; the other moves a little upon the end of the ulna, to which its form is adapted. It has often a little proceſs from its lower edge, which is analogous to the *os piſiforme*. The carpal bones are obliterated in the *ſtruthious* birds.

The *metacarpus* conſiſts of two bones, which are united at their ſuperior part by anchyloſis for ſome way. At this place there are ſome eminences which appear like the remains of the ſecond row of carpal bones ſoldered together. The articulation of the metacarpus with the carpus is the ſegment of more than the half of a pulley, which is grooved in the middle, and revolves within a correſponding ſurface of the lower carpal bone. This motion, for the convenience of deſcription, is called flexion and extenſion; but it is in ſtrictneſs a lateral movement back upon the ulna, and [illegible] companied with a degree of rotation, by which the [illegible] figure of the wing is loſt in the very action of f[illegible]. There is a ſtyloid proceſs on the upper part of the ra[illegible] ſide of the metacarpus, which [illegible] pointed bone, ſupplying [illegible] of the *thumb*. [illegible] bone is [illegible] to [illegible] the ſmall [illegible] the metacarpus, and correſp[illegible] one *little* [illegible] *principal*, or *fore finger*, which [illegible] culated with the large or radial branch of the [illegible]. It conſiſts of two phalanges, and the firſt exh[illegible] having been originally two bones. The two pieces of the metacarpus are to be ſeen in the *African oſtrich*, as alſo the three fingers; each of which is furniſhed with a hook, which is covered with a horn, like a claw; but in the *New Holland oſtrich* the metacarpus is a ſingle bone, and there is but one finger, which is alſo terminated with a claw. All the bones of the hand are compreſſed into thin plates in the *manchot*.

The *thigh-bone* of birds has nothing very peculiar in its form; it wants the ſmall trochanter; it is ſingularly ſhort, in proportion to the other parts of the limb, in ſuch birds as have long legs; it is longeſt in the *accipitres*, and ſhorteſt in ſome water-birds. The femur is ſtrong in all the *gallinæ*; and in the *ſtruthiæ* it is of an immenſe thickneſs; it is bent in the *cormorant* and the *little grebe*.

There is a certain portion of the ligament of the extenſor muſcles of the leg converted very early into bone; and this ſeems in general to ſupply the place of the *patella*; it is not uſually preſerved in ſkeletons.

The *tibia* reſembles in its form the ſame bone in mammalia. There are ſeveral prominent edges on the fore part of its head for the attachment of muſcles. The lower end of the tibia forms a pulley with a groove along the middle. The head of the tibia is prolonged in a remarkable manner upon the thigh, in the *grebes* and the *diver*.

The *fibula* is a very ſmall bone, and is ſoon anchyloſed to the ſide of the tibia.

The *tarſus* and *metatarſus* conſiſt, in the adult bird, but of one bone; it exhibits, however, grooves correſponding to the diviſions which exiſted between its ſeveral pieces when it was firſt formed. Theſe are ſtrongly marked in the long-legged birds, and ſhew that the metatarſus contained originally as many bones as there are principal toes. There is uſually alſo a prominence on the poſterior part of the head of the bone which repreſents the *os calcis*. The inferior extremity of the metatarſal bone produces a proceſs ſhaped like a pulley for the articulation with each of the principal toes.

There are three bones in the compoſition of the tarſus and metatarſus of the *manchot* ſeparate from each other in the middle; and therefore theſe birds are plantigrade, or walk upon the metatarſus as well as the toes.

The extraordinary length of limb which belongs to ſome kinds, as the *ſtruthious* and *wading birds*, depends upon the extent of the tibia and metatarſal bone.

The *ſtork*, and ſome others of the *grallæ*, which ſleep ſtanding on one foot, poſſeſs a curious mechaniſm for preſerving the leg in a ſtate of extenſion, without any, or at leaſt with little muſcular effort. There ariſes from the fore part of the head of the metatarſal bone a round eminence, which paſſes up between the projections of the pulley on the anterior

anterior part of the end of the tibia. This eminence affords a sufficient degree of resistance to the flexion of the leg to counteract the effect of the oscillations of the body, and would prove an insurmountable obstruction to the motion of the joint, if there were not a socket within the upper part of the pulley of the tibia, to receive it when the leg is in the bent position. The lower edge of the socket is prominent and sharp, and presents a sort of barrier to the admission of the eminence, that requires a voluntary muscular exertion of the bird to overcome, which being accomplished, it slips in with some force like the end of a dislocated bone. Dumeril and Cuvier have described a similar apparatus to this in the knee of the *stork*; but they must have confounded, in an unaccountable manner, the one joint with the other; for the articulation of the femur with the bones of the leg in the common *stork* (*ardea alba*), certainly exhibits nothing peculiar in its structure. See *Plate* VIII. in the *Anatomy of Birds*. *Fig.* 1. represents the anterior part of the articulation of the tibia with the metatarsus in the *stork*; *a* the tibia, *b* the metatarsal bone, *c c* the prominent edges of the pulley on the end of the tibia, *d* the round eminence of the head of the metatarsus, *e* the socket in the tibia, which receives the eminence during the flexion of the joint.

The *bones of the toes* vary in number, increasing from the inner to the external toes. Birds with four toes have the number of the phalanges in the following order, 2, 3, 4, 5; those with three toes have them, 3, 4, 5, except the *cassowary* and the *New Holland ostrich*, which have four joints to each toe. The *African ostrich* has only two toes, and four phalanges to both. Most birds have the three principal toes situated before, and the pollex attached to the inner and back part of the metatarsal bone near its extremity. The *bustard*, *cassowary*, *New Holland ostrich*, the *plover*, the *oyster catcher*, and the *long legged plover*, have but three toes; and the *albatross*, *petrel*, and *penguin*, want the pollex. All the *scansores* have their toes opposed to each other, two behind and two before.

It would have rendered the description of the bones tedious and confused, to have given frequent references to the plates which represent them; the reader, therefore, will have occasion to contemplate the relation the different figures bear to each other; and to facilitate such comparison, similar letters are employed to indicate similar parts in each of the skeletons chosen to illustrate the subject.

When birds transport themselves from one place to another, it is most commonly by the act of flying; which consists in the successive elevation and depression of the wings; the latter motion being performed with so much force and velocity, as to compress a volume of air, the re-action of which is sufficient to impel forwards the whole body of the bird. The various kinds of flight depend upon the different ways of employing the wings, and the habits and œconomy of the individual, which it is the business of the naturalist to point out. Many birds are capable of using other modes of locomotion besides flying, for which their structure is equally well adapted; for instance, some tribes almost constantly inhabit the water, and swim with the greatest ease; others walk or run with the greatest rapidity; and others transport themselves chiefly by the effort of climbing. We have, therefore, selected a skeleton to exhibit the organs employed in each of these species of locomotion. See *Plate* VIII. in the *Anatomy of Birds*. *Fig.* 2. represents a skeleton of the *New Holland ostrich*, which was brought into this country by an ingenious young surgeon, Mr. Langstaff. It seems to partake of the structure of both the *cassowary* and *African ostrich*, but it bears the greatest likeness to the latter; and therefore we have called the bird an ostrich, although it has hitherto been considered by some naturalists as a cassowary. This skeleton affords the best example of a *running* bird, which is at the same time incapable of flight. The sternum and bones of the wing are small; the centre of gravity is thrown fairly between the legs; and the inferior extremities are long, and of an immense disproportionate strength. *Fig.* 3. of the same plate exhibits the skeleton of the *lark*, which, as being a bird of high flight, forms a striking contrast with *fig.* 2.

Plate IX. of the *Anatomy of Birds*, contains the skeletons of a *climbing* and a *swimming* bird. *Fig.* 1. is the skeleton of the *parrot*. The body is round and contracted; the neck short, strong, and flexible in different directions; the sternum and bones of the shoulder rather small; but its chief characters are the long thigh, and very short metatarsus, furnished with the climbing toes; by which means the bird can grasp any foreign substance, and apply the feet to any part of its own body, after the manner of the prehensile members of other animals.

Fig. 2. of *Plate* IX. shews the skeleton of the *crested grebe* (*colymbus cristatus*). The neck is much bent; the parts of the upper extremity rather small; the ribs strong, and reaching far back; the sternum long; and the body possesses very much the form of a boat; the inferior extremity situated far behind, and the thigh bone very short, and the toes long and expanded; all which circumstances are necessary to the performance of the actions of swimming and diving with facility.

The separate parts of the skeletons, in *Plates* VIII. and IX. in the *Anatomy of Birds*, are indicated as follows.

Parts composing the head; *a* the occiput, *b* parietal bone, *c* os frontis, *d* temporal bone, *e* os lacrymale, or superciliary bone, *f* nasal bone, *g* superior maxilla, *h* malar bone, *i* bone of the upper mandible, *k* palatine bone, *l* septum of the orbits, *m* articular bone, *n* inter-articular bone, *o* zygoma, *p* inferior maxilla, *q* bone of the lower mandible, *r* external nares, *s* deficiency in the septum of the orbits where the optic foramina open, *t* temporal fossa, *u* spongy bone in the organ of smell.

Parts of the spine and trunk: *a* cervical vertebræ, *b* their transverse processes, *c* the styles which descend on the forepart, *d* articular processes, *e* posterior spinous processes, *f* spines on the anterior part of the bodies of some of the vertebræ, *g* dorsal vertebræ, *h* sacral vertebræ, *i* vertebræ of the tail, *k* the last, or caudal bone, *l* os ilium, *m* ischium, *n* pubis, *o* foramen ovale, *p* ischiadic foramen, *q* vertebral or false ribs, *r* the true ribs, *s* the sternal portions, *t* intercostal processes, *u* the part of the sternum next the body, *v* the keel, or projecting part, *x* deficiency at the lower part of the sternal bone.

Parts belonging to the wing; *a* the fork, *b* the clavicle, *c* the scapula, *d* the humerus, *e* its inner tuberosity, *f* the external tuberosity, *g* the spine for the attachment of the deltoid and pectoral muscles, *h* the ulna, *i* the radius, *k* the carpal bone on the radial side, *l* the ulna carpal bone, *m* the head of the metacarpus, *n* the large branch, *o* the smaller one, *p* the style of the metacarpus, *q* the pollex or thumb, *r* the little finger, *s* the principal or fore finger.

The parts of which the lower extremity consists; *a* the femur, *b* its single trochanter, *c* the tibia, *d* the elongation of the head of the tibia which occurs in the *grebe*, &c. *e* the fibula, *f* the metatarsus, *g* the prominence at the heel, *h* the pollex, or back toe, *i* the principal or anterior toes.

Muscles.

When the writing of the present article was begun, it was intended to give a full description of the muscles of birds; but as the subject has already extended beyond the length

length that was expected, and if this were done, would exceed the bounds usually allotted to a single article, we shall only point out the most striking peculiarities in the muscular system, and correct some errors into which other writers have fallen in their accounts of this part of the anatomy of birds.

The muscles which move the lower jaw, do not differ essentially from those of mammalia. There is no marked distinction between the *masseter and temporal muscles;* they form one mass which arises from the temporal fossa and inferior part of the orbit, passes under the zygoma, and covers the side of the lower jaw from the joint to the commencement of the bill.

There is a tendon which lies over the muscles on the side of the jaws, usually of a triangular figure; it is attached to the inferior bony portions of the orbit, connects them to each other, and thus completes the margin of the orbit. It is affixed to the protuberance on the outside of the lower jaw near the joint, and seems to prevent the mouth opening beyond a certain distance.

Birds have none of the *muscles of the face*, as they have no soft parts for them to move.

The lower jaw is depressed by a muscle which arises by two portions, one from the hollow behind the side of the occiput, the other from the surface behind and below the external meatus auditorius; both are inserted upon the back of the lower jaw. This muscle, although so unlike the *digastricus*, supplies its place, and fulfils its office.

There are three muscles for moving the upper jaw, which are quite peculiar to birds. The *first* is of a radiated or fan shape; it arises from the septum of the orbit, and passing obliquely backwards, is inserted by tendon into the external surface of the end of the inter-articular bone, just when it becomes joined to the articular. By pulling the posterior end of the inter-articular bone upwards, the opposite end is pushed forwards, which produces the elevation of the upper jaw in the manner already described.

The *second* is a short thick muscle, arising from below the posterior part of the orbit, and before the external meatus auditorius, and inserted into the inner surface of the body of the articular bone and its anterior process, where it joins the inter-articular bone; it elevates the posterior end of the inter-articular bone, and thus raises the upper jaw.

The *third* muscle is for depressing the superior jaw; it is of a long taper shape, has one attachment to the inside of the lower jaw, and then becomes affixed to the inside of the inter-articular bone, the internal part of the pterygoid process, and sends a small tendon to the integument of the palate, just where the horny covering of the mandible commences. It is difficult to distinguish it from the pterygoid muscle, which appears to aid it in the depression of the superior mandible.

The tongue enjoys much less variety of motion in birds than in mammalia; it is only capable of being protruded, retracted, turned to each side either directly or obliquely, slightly rotated, and depressed at the point. There are a great many muscles however employed in the performance of these motions; some of these act upon the os hyoides, and others upon the lingual bone.

The first is analogous to the *stylo-hyoideus;* arises from the upper and back part of the lower jaw, divides into two slips; one goes to the styloid bone of the os hyoides, where it meets its fellow: the other slip passes to the inner part of the middle bone or body of the hyoides; it retracts the tongue.

The second corresponds to the *mylo-hyoideus;* it is a broad thin muscle, proceeds from the inside of the lower jaw, except its posterior edge, which comes from the outer part of the jaw; it is inserted upon the concave side of the cartilaginous extremity of the horn of the os hyoides, around which it forms a muscular sheath; its use is to protrude the tongue.

The third muscle appears to answer to the *genio-hyoideus;* it comes from the superior edge of the lower jaw internally, and becomes attached to its fellow on the other side upon the styloid bone of the hyoides; protrudes the tongue a little from the obliquity of its direction, and seems to commence the actions of deglutition by elevating the parts in the bottom of the mouth. We did not observe this muscle in the *cock*.

The fourth muscle of the tongue is extended from the horn of the os hyoides at its root, to the styloid bone, where it joins the muscle of the opposite side. They approximate the horns of the hyoides, during the protrusion of the tongue.

The fifth is a very small muscle, lying along the internal surface of the horn of the os hyoides; it sends a delicate tendon to the under surface of the lingual bone, depresses the point of the tongue, and if it acts singly, turns the tongue.

The sixth is a little short muscle, which arises from the end of the middle bone of the hyoides, and is affixed to the under part of the lingual bone; depresses the tip of the tongue, and raises the base. This is a single muscle.

The seventh muscle lies along with its fellow upon the anterior surface of the superior larynx; it is attached to the root of the lingual bone. Its uses are to depress the base of the tongue, and thus elevate the point, and to retract the tongue while in the mouth.

The eighth is short; arises from the junction of all the bones of the os hyoides on the lower surface, and is inserted into the upper and outer corner of the base of the lingual bone. It brings the tongue into a straight line, after the other muscles have depressed the tip.

The ninth muscle is the last; it is very minute, and passes from the base of the lingual bone to the very tip of the cartilage; depresses the point of the tongue without elevating its root.

The muscles which protrude and retract the tongue, are remarkably large in the *woodpeckers* and *wrynecks*.

The *muscles which move the head and neck* are even more complicated in birds than in other animals. Most of them have their attachments so numerous and intermixed, that no description can convey an adequate idea of them.

The *longus colli* begins in the thorax on the anterior spines of the dorsal vertebræ; its fasciculi go from the anterior part or the cervical vertebræ to the styles and transverse processes; and their tendons are longest at the superior and inferior part of the neck.

The *rectus capitis major anticus* is continued from the head as low as the fifth vertebra of the cervical spine.

On the posterior part of the spine there is a small muscle which seems to represent the superior part of the *trapezius;* it is extended from the transverse processes of the four first cervical vertebræ to the back of the occiput; it brings the head backwards and to one side.

There are a great number of fasciculi interposed between the transverse and articular processes at the back of the neck. These tendons pass over several vertebræ before they are inserted on the middle of the neck, which is the part most bent backwards.

A muscle which has been considered analogous to the *cervicalis descendens*, is the chief extensor of the neck of birds. It arises from the spine of the back, opposite to the se-

cond rib by tendon, which, on coming upon the neck, receives ſeven ſlips of muſcle, which deſcend from the ſpines of the ſeven inferior cervical vertebræ. The muſcle then proceeds on the neck as a diſtinct ſlip, and at the upper part produces three tendons, which go to the back of the articular proceſſes of the ſecond, third, and fourth cervical vertebræ. Theſe tendons receive muſcular ſlips from the back of the ſpine as low as the ſeventh vertebra, or where the other ſlip began to deſcend. The aſcending faſciculi furniſh the tendons to the fifth and ſixth vertebræ, and to the atlas. This muſcle is enabled, on account of its deſcending and aſcending faſciculi, to extend the neck even while the head is erected. Cuvier deſcribes the muſcle ſomewhat differently in the *heron* and *buzzard*. The above account is from the *gooſe*.

There is a curious ſhaped muſcle along the inſide of the preceding, which Cuvier compares to the *biventer cervicis*. It commences by a ſlender tendon from the ſpinous proceſs of the firſt dorſal vertebra, becomes fleſhy at the lower part, tendinous along the middle, and again fleſhy near the head, and is inſerted into the occiput. Although it extends the whole length of the neck, it is ſo ſlender that its tendon is not thicker than a piece of twine or thread. It aſſiſts in the extenſion of the neck and elevation of the head.

The *trachelo-maſtoideus* ariſes in birds from the anterior part of the ſecond, third, and fourth cervical vertebræ, and is inſerted upon the ſide of the occiput.

The *complexus* proceeds from but a few of the articular proceſſes of the neck; and the *ſplenius* does not exiſt in birds.

Cuvier deſcribes three *recti capitis poſtici*; but theſe muſcles do not deſerve to be ſo called.

The firſt, which he names the *rectus maximus*, ariſes from the ſpine of the dentata, and is inſerted into the ſide and back of the occiput. It brings the head backwards, and to one ſide, and reſembles in figure and office the *ſplenius capitis*.

The ſecond, or *rectus major poſticus*, proceeds obliquely from the ſpine of the dentata, under the preceding, to the depreſſion on the back of the occiput.

The third, or *rectus minor*, is only a few fibres mixed with the ligament which connects the head with the ſpine.

The *muſcles of the back* conſiſt of a few fleſhy fibres interſpersed with portion of tendon, which are moſtly oſſified in [illegible] grown birds; they lie on each ſide of the dorſal [illegible], which they ſtrengthen but cannot move.

The muſcles of the tail are diſtinct, and generally large; ſome are calculated to raiſe the tail, ſome to depreſs it, others to [illegible] it laterally, and others again to unfold the quills of this part.

The firſt is the *levator coccygis* of Vic d'Azir; it ariſes from the back of the ſacrum and the tranſverſe and ſpinous proceſſes of the firſt caudal vertebra, and ſends diſtinct tendons to each [illegible] ous proceſſes of the tail and the [illegible] bone. There is a fleſhy ſlip alſo accompanying the [illegible] tendon. This muſcle, as its name implies, elevates the tail.

The ſecond, or *depreſſor coccygis* of Vic d'Azir, is ſituated within the pelvis, and ariſes from the end of the ſacrum and the iſchium, where they join; alſo from the tranſverſe proceſſes of the bones of the tail. It is inſerted by tendons into the ſpinous proceſſes of the under ſurface of the caudal vertebræ, and diſtributes a number of muſcular fibres in different directions on the baſis of the lateral quills. This muſcle depreſſes the tail, and appears alſo, from its attachment to the ligament of the quills, to be capable of converging them.

The third ariſes from the poſterior edge of the anterior part of the pubis, and the tendon covering the lower part of the belly, and is inſerted on the baſe of the ligament which ſuſtains the lateral quills. When this muſcle acts ſingly, it brings the tail downwards and to one ſide; if, with its fellow, it depreſſes the tail directly; but at all times it tends to ſpread the quills of the tail.

The fourth is the *motor lateralis coccygis* of Vic d'Azir, who deſcribes its origin different from what we have obſerved it to be. It ariſes from the laſt tranſverſe proceſs of the ſacrum and the firſt of the coccyx, and it turns round to be inſerted in common with the preceding muſcle upon the root of the ligamentous ſubſtance which connects the lateral quills. It moves, when acting alone, the tail to one ſide; but combined with its fellow and other muſcles, unfolds the quills of the tail in the manner of the ſticks of a fan.

The fifth muſcle is in part covered by the third; it is attached to the whole of the poſterior margin of the pelvis, except the extreme portion of the pelvis, and in the *gooſe* ſpreads even upon the parietes of the belly round the anus; it then proceeds to be inſerted, along with the depreſſor coccygis, on the under part of the caudal or laſt bone of the tail. Its office is, with its fellow and the depreſſor, to lower the tail.

The ſixth is the *cruro-coccygeus* of Vic d'Azir; it ariſes by thin tendon from the inner and back part of the thigh bone, where it is conjoined with one of the muſcles of the thigh. It is inſerted, along with the other muſcles of the tail, into the under part of the caudal bone. This muſcle draws the tail to one ſide; but when its action is combined with its fellow, it is the moſt powerful flexor or depreſſor of the tail.

The *muſcles of the trunk* deviate more from the ſtructure of mammalia than the muſcles of birds do in general, and have been but very imperfectly deſcribed by Cuvier and others.

The *ſcaleni* are merely two ſlips of muſcle, which deſcend from the next tranſverſe proceſs upon the firſt and ſecond ribs.

The *triangularis ſterni* takes its origin from the ſuperior corner of the ſternum and the four ſuperior ribs, where they join this bone, and is inſerted into the moveable angles of the four ſuperior ribs after the firſt. It compreſſes the ſuperior part of the thorax, and thus brings forwards the lower end of the ſternum; it is, therefore, a muſcle of expiration.

The abdominal muſcles conſiſt of three layers.

The firſt repreſents the *obliquus externus*, although its fibres are arranged tranſverſely. It ariſes from the edge of the ilium and pubis by a very thin tendon, and from the lower edges of the ribs, by diſtinct tendinous proceſſes, and is inſerted into the ſide and lower edge of the ſternum, and the middle line of the belly, to unite with the muſcle of the oppoſite ſide. From this muſcle paſſing over the moveable angles of the ribs, its action influences the whole cavity of the body; for at the ſame time that it compreſſes the abdomen, it raiſes the anterior part of the ſternum, by drawing the poſterior part backwards, and thus dilates the thorax, and becomes a muſcle of inſpiration, explaining by this means the effect we have already repreſented inſpiration to produce upon the abdominal air-cells.

The ſecond is the *obliquus aſcendens*; it is made of two portions, the one a little overlapping the other; the anterior is analogous to the *rectus abdominis*, and ariſes from the pubis and middle line of the belly; the other portion ariſes from the edge of the ilium and loweſt rib. The fibres of each portion aſcend in their proper directions to be inſerted on the lower edge of the ſternum, and the tendon filling the

the ſpace between the ribs and the ſternum. This muſcle, like the preceding, diminiſhes the abdomen, and dilates the anterior part of the thorax.

The third layer anſwers to the *tranſverſalis abdominis*. It proceeds from the oſſeous margin of the abdomen to the middle line, where it meets its fellow. They conſiſt of ſeparate faſciculi at the ſuperior part; and the fibres are collected round a point in the centre, where the yolk paſſed into the belly of the chick.

There is a very thin ſlip of muſcle, which croſſes the loweſt part of the belly; it is ſituated ſuperficially, and lies over ſeveral of the muſcles of the tail. In the *goſe* it ariſes from the iſchium, where that bone joins the pubis; and in the *fowl* it is only attached by cellular membrane to the ſurface of the muſcles of the thigh. It is inſerted, in both caſes, on the ſide of the anus, which it ſeems deſigned to dilate.

We have obſerved in the *fowl* two very ſlender faſciculi of muſcle to deſcend from the ſide of the rectum, one to the ligament ſupporting the quills of the tail, the other to the inſide of the pelvis. They are both probably intended to produce the evertion of the intestine during coitus.

The muſcles [illegible] do not differ in their arrangement and [illegible] from those of the anterior extremity of man made so much [illegible] ought to be expected, considering how little these members resemble each other in their functions.

The *latiſſimus dorſi* ariſes only from the ſpines of the dorſal vertebræ; it reſembles, however, the muſcle of the ſame name in mammalia.

A muſcle, analogus to the inferior portion of the *trapezius*, is obſerved at the ſhoulder. It comes from the ſpinous proceſſes of the three laſt cervical and all the dorſal vertebræ, and is inſerted into the inner and back part of the fork and poſterior edge of the ſcapula. We have not perceived the diſtinction of this muſcle into two parts on the ſhoulder, as ſtated by Cuvier.

The *ſerratus major anticus* is only inſerted into the point of the ſcapula. This muſcle has been called by Vic d'Azir the *ſubſcapularis*.

The *coſto-ſcapularis* of Vic d'Azir goes from the firſt ribs to the neck of the ſcapula. It appears to be analogous to the *pectoralis minor* of the human ſubject.

The *rhomboides* is not diviſible into *major* and *minor*. It ariſes, as uſual, from the ſpine, and is inſerted in the poſterior edge of the ſcapula.

A muſcle, analogous to *levator ſcapulæ*, ariſes by three ſlips from the tranſverſe proceſs of the laſt cervical vertebra and the firſt and ſecond ribs. It is inſerted into the middle of the ſcapula, which it elevates and draws backwards. The motions of the ſcapula are neceſſarily very limited from its mode of connexion with the neighbouring bones; and its rotation is reſtrained by a ligament which joins the point of the ſcapula with the dorſal ſpine. It is requiſite the bones of the ſhoulder ſhould be kept very ſteady during flight.

There are three pectoral muſcles.

The *pectoralis maximus* of Vic d'Azir might be called, with more propriety, the *depreſſor alæ magnus*. It ariſes from the whole of the body and heel of the ſternum, except a certain portion of the anterior ſurface occupied by the next muſcle over which it lies, and from the ſide of the fork and the laſt ribs, and is inſerted into the ſpine on the outſide of the humerus, where it is connected by ligament with the deltoid muſcle. The pectoralis maximus has commonly more ſtrength than all the other muſcles of the body united, which is required to accompliſh the depreſſion of the wing in oppoſition to the whole weight of the bird during flight.

The *pectoralis medius* of Vic d'Azir might be called the *levator alæ*. It is affixed to the fore part of the body and keel of the ſternum, the ſide of the clavicle, and the membrane which fills the interſpace between that bone and the fork. It ſends its tendon over the head of the ſcapula through the pulley formed by all the bones of the ſhoulder, to be inſerted on the external tuberoſity of the head of the humerus. By means of the pulley it elevates the humerus, and conſequently the wing; and from occupying the lower part of the cheſt, the weight is kept in the ſituation moſt convenient for the bird during flight.

The *pectoralis minimus* of Vic d'Azir, or *depreſſor alæ minor*, ariſes from a portion of the ſternum behind the articulation of the clavicle, and from the inſide of the ſternal extremity of the clavicle. It is inſerted under the head of the humerus; depreſſes the wing, and brings it cloſe to the body.

The *ſubclavius* is extended from the inſide of the ſternal extremity of the clavicle to the adjoining part of the internal ſurface of the ſternum. It is impoſſible to conceive the uſe of this muſcle, unleſs it be to ſtrengthen the joint, as its attachments are incapable of motion towards each other. There are muſcles analogous, as much as the form of the bones will permit, to the *ſubſcapularis*, *teres major* and *minor*, *ſupra ſpinatus*, and *infra ſpinatus*.

Cuvier deſcribes two little muſcles which come from the inſide of the clavicle to the head of the humerus. We have obſerved a muſcle in the *fowl* which appears to correſpond to one of theſe; it ariſes from the inner ſurface of the clavicle, and its joint with the ſternum, paſſes over the firſt rib, and is affixed to the top of the inner tubercle of the head of the humerus. It rotates the wing inwards, when it has been ſpread in flight. The lower edge of this muſcle, and the inſide of the teres major, produce a moſt delicate tendinous cord, or fibre, which deſcends on the back of the upper arm, and is loſt amongſt the ligaments of the quills below the elbow. The effect of this, if any, is to bring the wing nearer the body, and perhaps ſpread the quills.

The *deltoides* is ſmall, and of two portions. One ariſes from the fork at the top of the ſhoulder, and ſends a ſmall tendon to the aponeurotic expanſion of the fold of the wing. This tendon, as it proceeds along the edge of the expanſion, acquires exactly the ſtructure and the elaſticity of the *ligamentum nuchæ*; it then becomes like common tendon, paſſes over the end of the radius, and is inſerted into the ſtyle of the metacarpal bone. It bends the fore arm, extends the hand, and, in conſequence of the elaſticity of the tendon, contracts the ſoft part of the fold of the wing. This portion of the deltoid has eſcaped the obſervation of Cuvier and other writers, although the ſtructure of the tendon is one of the moſt extraordinary circumſtances in the anatomy of birds. The remaining portion of the deltoid is analogous to the ſame muſcle of the human ſubject, and brings the wing upwards and backwards in flight.

The muſcle which repreſents the *biceps flexor cubiti*, takes its origin from the end of the clavicle, where it joins the fork; and from the ſharp tubercle of the humerus, which is analogous to the coracoid proceſs, the chief part of the muſcle proceeds to be inſerted into the inſide of the neck of the radius; but as it deſcends, a ſmall portion goes off, and is expanded in the fold of the wing, and attached to the outer ſide of the arm. This expanſion of tendon correſponds to the aponeuroſis of the biceps muſcle of the human ſubject; but inſtead of lying cloſe to the fore arm, it is ſpread out and covered with the common integuments.

The *brachialis internus* is very ſmall, being only attached

to the fore part of the end of the humerus between the condyles.

There is a ſhort muſcle which ariſes from the ligament that conjoins the clavicle and the head of the humerus, and is inſerted upon the flat external ſurface between the two tubercles. It is an *elevator* of the wing. It is peculiar to birds, and has not yet been deſcribed.

The *extenſor cubiti* conſiſts of two portions; the one, called by Vic d'Azir the *extenſor longus*, comes from the junction of the fork and ſcapula; the other ariſes in a forked manner from the poſterior ſurface of the humerus, and is the *extenſor brevis*.

The *anconæus minor* of Cuvier is the external and lower part of the *extenſor brevis*. It is a diſtinct muſcle in the *fowl*, though not in the *gooſe*.

Although the bones of the fore arm do not admit of *pronation* and *ſupination*, the muſcles which perform theſe motions in other animals, exiſt in birds, and anſwer different purpoſes.

The *ſupinators* reſemble thoſe of the human ſubject. The *longus* terminates on the ſtyle of the metacarpal bone, and ſerves both to bend the arm on the humerus, and extend the metacarpus, or lower part of the wing. The *ſupinator brevis* bends the fore arm. The place of the *pronator teres* is ſupplied by two muſcles very much like it in ſhape; they act as flexors of the fore arm. There is a triangular muſcle which in ſome degree fills the ſituation of the *pronator quadratus*; it ariſes from the end of the ulna, and ſends a broad tendon over the carpus to the higheſt ſcabrous ſurface on the matacarpal bone. It extends the hand, or lower part of the wing, giving it at the ſame time a degree of pronation, which the carpal joint permits, in order to render the wing concave when it is extended.

The *flexors and extenſors*, ſituated on the fore arm of birds, reſemble in ſhape and arrangement generally thoſe of the human ſubject, but commonly have their uſes changed, and often even reverſed, in conſequence of the difference in the figure of the bones and the plan of their articulations.

The muſcle which correſponds in ſituation to the *extenſor carpi ulnaris*, performs the motion which is called flexion of the lower part of the wing.

There is a ſtrong muſcle ariſing from the external condyle of the humerus, and implanted into the ſide of the ulna oppoſite the radius, for almoſt its whole length. It raiſes the fore arm on the radius, and ſeems to be the muſcle called by Vic d'Azir *flexor profundus*.

The muſcle analogous to the *extenſor pollicis longus*, has its tendon inſerted into the ſtyle of the metacarpus, and into the ſhort abductor. It extends the hand on the fore arm.

The *ulnor flexor* bends the parts of the wing.

The *flexor ſublimis* comes from the internal condyle, is attached to the lower carpal bone, and ſends a tendon to the baſe of the firſt joint of the principal finger, bends the hand, but extends the finger.

The *flexor digitorum profundus* ariſes from the inner ſurface of the ulna; its tendon paſſes over a little pulley on the metacarpal bone, and terminates on the end of the laſt joint of the principal finger, which it extends, but bends the wing.

The *extenſor communis digitorum* and *indicator* ariſe from the external condyle and inſide of the radius. They ſend tendons to the firſt and laſt joints of the principal finger, which they extend.

The fingers of birds are furniſhed with many ſhort muſcles; and notwithſtanding they are very palpable, ſeem to have eſcaped the obſervation of Cuvier and other anatomiſts.

The *flexor brevis pollicis* comes from the inſide of the head of the metacarpal bone to the flat ſurface of the bone of the thumb. The *extenſor brevis pollicis* proceeds from the triangular ſurface of the metacarpus, behind the joint, to the baſe of the thumb. The *abductor pollicis* is extended between the ſtyle of the metacarpal bone and the outer edge of the bone of the pollex. The *adductor pollicis* is expanded between the branch of the metacarpus and the bone of the thumb. The *abductor*, or *extenſor brevis indicis*, is extended all along the radial edge of the metacarpal bone, and is ſpread upon the root of the firſt joint of the principal finger. It brings the finger into a line with the metacarpus. The *adductor indicis* comes from the ulnar ſide of the large branch of the metacarpus to the root of the firſt joint of the fore finger. The *abductor minimi digiti* lies along the ulnar edge of the ſmall branch of the metacarpus; and as the little finger is tied to the other by ligament, this muſcle produces the lateral flexion or abduction of both. The laſt is the *interoſſeus*; it fills the ſpace between the branches of the metacarpus, and its tendon paſſes along the back of the principal finger to the extremity; it bends the firſt joint laterally, and extends the reſt of the finger.

The *muſcles of the lower extremity* are very numerous in birds, and poſſeſs ſeveral peculiarities, notwithſtanding the motions of this member are ſo ſimple. The articulation of the femur with the pelvis permits the thigh to move freely forwards and backwards, but does not allow it to be carried under the body, or far outwards. The motions of all the other joints of the inferior extremity are merely flexion and extenſion.

In conſequence of the form of the pelvis, the *iliacus*, the *pſoas magnus* and *parvus*, the *obturator externus* and *quadratus lumborum*, do not exiſt in birds. Cuvier alſo ſtates the *pyriformis* and *gemini* to be wanting; but we have ſeen a little muſcle which paſſes from the projection above the acetabulum to the trochanter, which appears to ſupply the place of the *pyriformis*.

The *obturator internus* is generally a large muſcle, and paſſes over a pulley at the fore part of the foramen ovale, where it receives two little ſlips analogous to the *gemini*; they are inſerted into the outer part of the trochanter.

There are three *gluteal muſcles*, as in quadrupeds. The *gluteus maximus* is attached by a broad thin tendon to the prominence along the dorſum of the ilium, covers the outſide of the thigh, and contributes to form the extenſor tendon on the ſide of the knee. The anterior part of this muſcle correſponds to the *tenſor vaginæ femoris*. The *gluteus medius* occupies its uſual ſituation. The *gluteus minimus* is a maſſy muſcle, ſo much placed on the anterior edge of the ilium, that Vic d'Azir conſidered it (perhaps not improperly) as the *iliacus*. It brings the thigh directly forwards, and rotates the knee inwards.

The muſcle analogous to the *quadratus femoris* is large and of a pyramidal ſhape. It retracts the thigh.

The *extenſor muſcles* of the leg reſemble thoſe of mammalia. The *vaſtus internus* ſends its tendon to be diſtinctly attached to the head of the tibia. The *ſartorius* alſo is an extenſor of the leg on the thigh.

There are *three flexors* of the leg: one, which, although ſingle, is, from its inſertion into the back of the fibula, analogous to the *biceps* of the human ſubject; another, on the inſide, is attached to the tendon of the extenſors of the heel, as well as to the tibia. This muſcle might be called either *gracilis* or *ſemimembranoſus*, for it reſembles both. The third flexor is in the middle. It comes from the iſchium; and as it

it descends, it receives a broad slip of muscle from the back of the femur. It is inserted on the back of the tibia, and the tendon covering the extensors of the heel.

There is a large muscle on the inside of the thigh, which supplies the place of the *triceps*. It performs adduction, but it is also employed in carrying the limb backwards.

A muscle, which Cuvier appears to reckon as the *second adductor*, arises from the back of the ischium, and is inserted into the middle of the femur in company with the *cruro-coccygeus* muscle. It retracts the limb.

The muscles for extending the heel, and consequently the lower part of the leg of birds, differ in many respects from the *gastrocnemii* of mammalia. The tendo achillis is produced by three portions of muscle; and, after passing over a moveable cartilaginous pulley which is placed on the heel, it spreads on the sides of the metatarsal bone. The first portion arises from the inner and fore part of the joint of the knee, and is connected for some way with another muscle, which lies on the outside of the joint. The second portion is small, and from the back of the internal condyle of the femur. The third is a very strong muscle arising by tendon from the outside of the thigh bone, just above the condyle. These three heads appear to be the *external gastrocnemius*.

The *soleus* is represented by a muscle which arises from the outer part of the knee joint, from the upper part of the tibia, and from the fore part of the fibula. It is inserted into the pulley on the heel, and sends a tendon to join that of the flexor of the first phalanx of the toes; and therefore it bends the toes; while it acts on the heel.

There is also a muscle which appears to supply the place of the *plantaris*. It comes from the back of the head of the tibia, and affixes its delicate tendon to the inside of the moveable pulley of the heel.

The *tibialis anticus* arises by two heads, and is inserted into the fore part of the upper end of the metatarsal bone. It bends the joint of the heel.

The *tibialis posticus* is not found in birds.

There is a short *peroneal* muscle which is inserted into the outside of the metatarsal bone. It merely bends the joint.

The other muscles situated along the legs, are for the flexion and extension of the toes. The *extensor longus digitorum* exhibits no peculiarity, except that its tendon goes through a hole in the end of the tibia. There is no *long extensor* for the back toe.

The *flexors* of the toes are very complicated: they may be divided into the *flexor sublimis* and *flexor profundus*. The first is composed of several portions; two of these are *peroneal* muscles, and send their tendons to the first joint of the internal toe and the second phalanx of the middle toe; the two other portions of the *flexor sublimis* arise, one from the outside of the fibula, and the other from the back of the joint and internal condyle of the femur. The one on the fibular side is joined by the tendon of the *accessorius femoralis flexorum*: a muscle, which arises from the spine of the pubis, runs along the thigh, and sends its tendon through a sheath that runs over the ligament of the patella, to arrive on the fibular side of the leg. The two portions of the flexor, after this, unite, separate, and unite again, and at last produce three tendons, of which two go to the first phalanges of the internal and middle toes, and the third to all the joints of the outer toe except the last. Those tendons which pass beyond the first joint, are *perforating* as well as *perforated*.

The *flexor profundus* arises as two distinct muscles; the one from the back of the femur, and the other from the back of the bones of the leg. The two tendons unite on the back of the metatarsal bone, and send off tendons to the last phalanges of the toes, which perforate those of the flexor sublimis.

All the flexor tendons are inclosed in a tendinous sheath, as they pass along the back of the metatarsus; and some of them go through the moveable cartilaginous pulley of the heel, and others run in sheaths formed in the cartilage which covers the top of the metatarsal bone.

The circumstance of the flexion of the toes accompanying that of the other joints of the lower extremity of birds, was long ago observed by Borelli, and attributed by him to the connexion the flexors of the toes have with the upper parts of the limb, by which they are mechanically stretched when the knee is bent. This explanation has been controverted by Vic d'Azir and others, who have referred the effect to the irritability of the muscles. The opinion of Borelli appears, notwithstanding, to be well founded; for not only the tendon of the accessory flexor passing round the knee, but the course of the flexor tendons over the heel and along the metatarsus, must necessarily cause the contraction of the toes, when either of these joints are bent; and if the phenomenon was not produced on mechanic principles, it would be impossible for birds to exhibit it during sleep, which they do, or to prove the effect on the limb of a dead bird, than which nothing is more easy. The utility of this contrivance is great in all birds, but particularly so to the rapacious tribe, which by this means grasp their prey in the very act of pouncing on it; and it is still more necessary to those birds which perch or roost during their sleep, as they could not otherwise preserve their position when all their voluntary powers are suspended.

There are six long small muscles lying on the metatarsal bone; they are largest and best marked in those birds which walk most. Two of these are on the posterior surface; one goes to the base of the external toe, which it *abducts*; the other is inserted into the root of the back toe, which it *bends*. On the anterior part of the metatarsus there are four muscles: the first *extends* the back toe; the second goes to the base of the first toe, and *abducts* it; the third is spread on the root of the middle toe, which it *extends*; the fourth lies along the outside of the metatarsus, perforates the end of the bone, and is implanted into the inside of the external toe, and *adducts* it.

Brain.

This organ exhibits several deviations from the structure of the brain of mammalia, which afterwards appear in a more marked manner in the inferior classes of animals. Accordingly, in the scale of existence, or with respect to sensitive or mental faculties, the rank of birds is clearly fixed below that of mammalia, and above that of other animals. The rules which have been established to determine the degree of intelligence possessed by species or individuals, according to the proportion the brain bears to the whole body, or other parts of the nervous system, do not appear so applicable in birds as in mammalia. It is, however, very difficult to appreciate the capacity of birds, as they are so much the slaves of instinct, that it is often impossible to discover whether their actions arise from the impulse of this principle, or depend upon the recollection and association of external sensations. The largest birds generally have the smallest proportion of brain to the whole body; and some of the small birds have the proportion of brain so great, that they would, agreeable to the rules laid down, excell in mental endowments man himself: for instance, the brain of the *canary bird* is equal to the one-fourth of the whole body; and in the human subject it is only the one-twenty-fifth part. The diameter of the

the brain, in relation to the medulla oblongata, has been ascertained only in a few species of birds, in which it has been observed as follows:

	Medulla oblongata.	Brain.
Falcon	13	34
Owl	14	35
Duck	10	27
Turkey	12	38
Sparrow	7	18

The brain of birds is invested with the same coverings which are described in mammalia.

The *form* of the cerebral mass is very different from that of the human brain, which chiefly arises fom the optic thalami being visible externally. The *hemispheres* are therefore proportionately diminished. They assume the shape of a heart with the point turned forwards. On the lower part of the side of the hemisphere there is a depression which corresponds to the *fossa* of *Sylvius*, and is the only appearance of a division into *lobes*. Underneath the hemispheres the *thalami nervorum opticorum* are found, as two distinct tubercles, each equalling in magnitude a lobe or division of the brain. They unite before the infundibulum, and send off the optic nerves; there are, therefore, six parts, or principal eminences, of the brain of birds, visible externally; the two hemispheres, the two thalami, the cerebellum, and the medulla oblongata. There are no *convolutions*, or winding impressions, on the surface of any of these parts, except the cerebellum, which is transversely furrowed, but not divided into two lobes. The *medulla oblongata* is round, and smooth on the under surface, being unfurnished with the eminences called *pons Varolii*, *corpora pyramidalia*, and *corpora olivaria*.

On separating the hemispheres a little, it is perceived that they are united at their lower part, or over the third ventricle. The junction is effected by white medullary substance, which afterwards spreads in a radiated manner, on the surfaces of the hemispheres that are opposed or applied to each other, almost as high as the top of the cerebrum. In reality, this medullary union of the hemispheres corresponds to the *fornix*, and can, like it, be traced to the anterior commissure in the third ventricle; but instead of being connected to the *septum lucidum* and *corpus callosum*, as these parts do not exist in birds, it spreads on the inner surfaces of the hemispheres, and thus contributes to form the internal parietes of the lateral ventricles.

Behind the radiated partition of the hemispheres, and without the third ventricle, the *posterior commissure* presents itself, and consists usually of more than one white line connected together by a white fibre, like a nerve passing obliquely across. The vault of the *canalis medius* is also visible, and is composed in part of a white medullary band; and behind this, another white cord runs across, which is the fourth pair of nerves at their origin.

The *lateral ventricles* are not prolonged posteriorly, nor possess what is called the *reflected horn*; the *great* and *lesser hippocampus* have therefore no existence.

The *corpus striatum* fills the ventricle almost entirely, projecting from the external side of it in the shape of a kidney. It does not exhibit on a section regular or strong marked striæ.

There are no *tubercula quadrigemina*.

The *pineal gland* rests upon a flat surface; it is very small, and inveloped in pia mater, and covered by a large vein. The plexus choroides also at this place divides into two tufts, or bunches, which pass into the lateral ventricles by two foramina in the back of the internal parietes.

The *third ventricle* possesses its usual situation between the thalami and its slit-like shape, and communicates with the canalis medius under the posterior commissure, and with the infundibulum behind the anterior commissure.

The *infundibulum* and *pituitary gland* are both large in proportion to the other parts.

The *thalami nervorum opticorum* contain each a ventricle, which opens into the canalis medius; therefore, there may be six ventricles reckoned in the brain of birds.

The *fourth* ventricle exhibits no peculiarity.

There are no eminences corresponding to the *corpora candicantia*; Cuvier has described four round eminences between the thalami and corpora striata, which are particularly plain in the *ostrich*. These are analogous to the tubercles of the brain of fishes.

The olfactory nerves arise, in birds, from the very points of the hemispheres, and often have a degree of enlargement at their origin, which resembles the olfactory tubercles of fishes. There are eight other pair of cerebral nerves, which have nothing very peculiar in their origin.

See *Plate* X. of the *Anatomy of Birds*. *Fig.* 1 presents a lateral view of the brain of the *goose* abstracted from the head; *a* the hemisphere, *b* the depression analogous to the fissura Sylvii, *c* the optic thalamus, *d* the cerebellum, *e* the medulla oblongata, *f* the beginning of the medulla spinalis, *g* the infundibulum, *h* the pituitary gland. The different nerves are indicated by numbers, as they arise, from 1 to 9. N° 1. the olfactory nerve, N° 2. the optic, N° 3. the oculo-muscular nerve, N° 4. the patheticus, N° 5. the trifacial nerves, N° 6. the nervus abducens. N° 7. the seventh pair, or auditory, N° 8. the eighth pair, N° 9. the hypoglossal nerve.

Fig. 2. of the same plate, shews the internal parts of the brain, as they are exposed without dissection, simply by pushing the hemispheres to each side, and drawing the cerebellum a little back: *aa* the two hemispheres, *b* the cerebellum, *c* the medulla oblongata, *ee* the radiated white lines seen arising from the junction of the hemispheres, and forming part of the parietes of the lateral ventricles, *f* the tranverse medullary cords corresponding to the posterior commissure, *g* the white band of the roof of the canalis medius, *h* the fourth pair of nerves crossing behind it, *i* the pineal gland obscured by the vena galeni and the plexus choroides, *k* the latter passing into the ventricle.

The third figure of the tenth plate of the *Anatomy of Birds*, gives a view of the interior of the ventricles of the thalami nervorum opticorum, and the third ventricle; *aa* the hemispheres laid down very much to each side, by which the white partition is ruptured, and the third ventricle brought into view, they are also pulled forwards to expose the thalami; *b* the cerebellum; *c* the medulla oblongata; *dd* the two optic thalami, that on the right side is cut open to shew the ventricle and its communication with the canalis medius; *e* the tract of the third ventricle and canalis medius, along which a bristle is passed into the fourth ventricle; *f* the anterior commissure, which seems to produce the medullary radii that unite the hemispheres.

Nerves.

The *olfactory nerve* has been already mentioned to pass along a canal, or groove, in the upper and inner part of the orbit, to reach the nasal cavity; in which its distribution will be pointed out in describing the organ of smell.

The *optic nerves* pursue their ordinary course, as in other animals.

The distribution of the *third*, *fourth*, and *sixth* pair of nerves, is almost the same as in mammalia.

The branches of the *fifth* pair bear great resemblance to the

the ſame nerves in quadrupeds. They are diſtributed to the bill, and are therefore the nerves of the organ of touch in birds, under which head they will be farther noticed.

The *portio dura* of the ſeventh pair, or the *facial* nerve, is ſo ſmall in birds, that it can hardly be diſcovered. Its offices are not required, in conſequence of the ſtructure of the parts of the face in theſe animals.

The *portio mollis* is remarkably ſoft; when it ariſes from the brain, it is a tender pulp, of a reddiſh colour.

The *par vagum*, or *pneumo-gaſtric* nerve of the eighth pair, ſometimes paſſes out of the cranium in two or three filaments, which afterwards rejoin. On leaving the ſkull, this nerve communicates with the lingual and gloſſo-pharyngeal nerves. The par vagum, after this, paſſes as a diſtinct ſtrong cord along the neck, in company with the jugular vein, and deſcending into the cheſt, forms the *cardiac* and *pulmonary plexuſes*, as in mammalia. The two nerves unite behind the heart, and proceed along the œſophagus, to terminate in anaſtomoſes with the great ſympathetic nerve. We have not obſerved the *recurrent* branch of the eighth pair.

The *gloſſo-pharyngeal* nerve of the eighth pair makes its exit from the cranium through the poſterior foramen lacerum in two filaments, which immediately unite to form a quadrangular ganglion, which ſends off a ſmall nerve to the anterior muſcles of the neck, and another branch to anaſtomoſe with the par vagum; the nerve then deſcends along the œſophagus, and divides into two branches, of which one paſſes upwards to the muſcles of the os hyoides, which include it between them, and the other furniſhes a branch to the lingual nerve, and afterwards is expanded upon the œſophagus.

The *hypogloſſal nerve* is ſmall where it paſſes through the condyloid foramen of the cranium; it croſſes and partly unites with the par vagum, at which place it detaches a filament towards the thorax, which ſeems analogous to the *deſcendens* noni. The trunk of the hypogloſſus goes forwards under the horn of the os hyoides, and divides into two principal branches, which are diſtributed to the tongue.

The *cervical*, *dorſal*, *lumbar*, and *ſacral* nerves, ariſe from the medulla ſpinalis exactly as they do in quadrupeds, and only vary in their number, which is determined by the number of vertebræ belonging to each region of the ſpine.

The *phrenic nerve* is not found in birds, in conſequence of the abſence of the diaphragm.

The *intercoſtal*, or *great ſympathetic nerve*, is deſcribed as entering the cranium by the foramen lacerum poſterius. It unites with the fifth and ſixth pairs, and produces a lenticular ganglion below the ſkull, which communicates with the eighth and ninth pair of nerves. The appearance of the ſympathetic nerve is, however, ſoon loſt on the neck; for the cervical nerves form their anaſtomoſes with each other in the vertebral canal, from which a nerve is ſent out between each vertebra to ſupply the muſcles and integuments of the neck. Theſe nerves are remarkably large. On coming into the thorax the great ſympathetic ſends a branch to the pulmonary plexus of the par vagum; it anaſtomoſes alſo with the brachial plexus; and below the ſecond rib, the ſympathetic commences a ſeries of ganglia, which are very conſpicuous between each of the ſucceeding ribs, but become leſs viſible along the remaining part of the ſpine. Theſe ganglia are central points for the union of a number of nerves. They receive filaments from each other, which paſs over the heads of the ribs; they communicate backwards with the ſpinal nerves; they detach on the outſide the intercoſtal nerves, which are large, and beſides ſupplying the intercoſtal ſpaces, give branches to the muſcles and integuments upon the ſides of the body; they laſtly ſend off filaments anteriorly, which anaſtomoſe with each other on the ſide of the dorſal ſpine, and form cords, which become the ſplanchnic nerves. In this manner there is produced on each ſide of the dorſal ſpine a reticulation of nerves which incloſes in its meſhes the heads of the ribs, and has a ſtriking effect. The firſt dorſal ganglion unites with the brachial plexus and the cardiac plexus of the par vagum.

The *ſplanchnic* nerves, after being formed by the anterior branches of the ſympathetic, paſs to the roots of the principal arteries of the viſcera. Thoſe of the cæliac artery produce a plexus round the trunk of this veſſel, and where the artery is divided, there are one, two, or three enlargements, which are analogous to the *ſemilunar ganglia*; and the nerves which depart from theſe, incloſe the arteries in a reticulated manner, and repreſent the *ſolar plexus*.

There are ſimilar plexuſes on the other chief arteries of the trunk, which correſpond to the *ſuperior* and *inferior meſenteric* and *renal* plexuſes, &c.

The nerves of the ſolar plexus accompany the branches of the cæliac artery to the ſtomach, ſpleen, liver, and pancreas, around which they continue to form numerous anaſtomoſes, that may be compared to the *ſtomachic*, *ſplenic*, *hepatic*, and *pancreatic plexuſes*.

The *nerves of the wing* more nearly reſemble thoſe of the ſuperior extremity in mammalia, than Cuvier has repreſented. The *brachial plexus* is produced by the two laſt cervical and firſt dorſal, and not, as he has ſtated, by the laſt cervical and two firſt dorſal nerves. The union of theſe three branches gives riſe to three others, which are diſtributed in the following manner:—The firſt is a very fine filament, which runs down on the inſide of the arm, and is loſt about the internal part of the elbow. This is analogous to the *internal cutaneous* nerve. The ſecond is a large cord; it gives off a very large branch, which divides into many others, for the ſupply of the pectoral muſcles; it ſends ſeveral ſmaller branches to the muſcles under the clavicle, and about the joint, and then proceeds to the inner edge of the biceps muſcle, along which it deſcends to the fold of the arm, after giving ſome large muſcular branches. Before it reaches the joint, it divides into two branches; one of which is analogous to the *ulnar* nerve, and the other ſoon divides again into nerves which are ſimilar to the *median* and *muſculo-cutaneous*. The *median* dips down amongſt the muſcles on the middle of the fore arm, to which it gives branches, and afterwards runs along the interoſſeous ſpace, paſſes under the annular ligament of the carpus, and is diſtributed to the ſhort muſcles of the digiti. The branch analogous to the *muſculo-cutaneous* nerve, is expanded upon the muſcles on the upper edge of the radius.

The *ulnar* nerve, although it appears to be incorporated with the *median* on the upper arm, can be eaſily ſeparated from it and traced to its proper origin in the brachial plexus. After this nerve leaves the median, it turns over the end of the foramen to get upon the edge of the ulna. It gives filaments to the muſcles in this ſituation; but its chief branch runs down ſuperficially upon the ligaments of the quills in company with the vein, and goes ultimately to be loſt upon the ulnar edge of the hand.

The third cord furniſhed by the brachial plexus, ſupplies the place of the *radial* nerve. It detaches ſeveral filaments to the muſcles on the inſide and back of the ſcapula. It gives off alſo the *articular nerve*, and then winds round the humerus between the extenſor muſcles, to which it furniſhes ſome large filaments. On coming to the outſide of the humerus, it ſends a branch between the integuments of the fold

fold of the wing. The nerve now turns round the neck of the radius, beneath the muſcles, and forms two branches; of which one paſſes under the muſcles to the outer ſide of the ulna, along which it runs ſuperficially to the hand; the other branch paſſes on the radial ſide, but more deeply amongſt the muſcles, goes under the annular ligament of the carpus, proceeds between the branches of the metacarpus, and is finally loſt on the back of the digiti.

Although Cuvier has given a more accurate deſcription of the nerves of the lower extremity, than of thoſe of the wing, it nevertheleſs needs correction in ſeveral particulars, which we have ſupplied.

The *obturator* and *femoral* nerves ariſe from the ſame plexus which is formed by the two laſt lumbar nerves, by a communicating branch from the firſt ſacral pair. The obturator nerve paſſes through the upper part of the foramen ovale, and is diſtributed to the muſcles around the hip joint, eſpecially the adductor. The femoral nerve paſſes out of the pelvis in company with the artery, over the upper edge of the ilium. It divides into three branches, which are diſperſed amongſt the muſcles and integuments on the anterior and inner part of the thigh. Some of theſe filaments are long, and deſcend ſuperficially for a conſiderable way upon the limb.

The *iſchiadic* nerve is compoſed of the five ſuperior ſacral nerves; and as ſoon as it departs from the plexus, even within the pelvis, is eaſily ſeparable into its primary branches. Immediately after it paſſes through the iſchiadic foramen, it ſends filaments to the muſcles on the outer part of the thigh; it then proceeds under the biceps muſcle, along the back of the thigh, about the middle of which it becomes divided into the *tibial* and the *peroneal* nerves.

The *tibial* nerve, even before it arrives in the ham, ſeparates into ſeveral branches, which paſs on each ſide of the blood-veſſels, and are chiefly diſtributed to the muſcles on the back of the leg. Two of theſe branches, however, are differently diſpoſed of: the one accompanies the poſterior tibial artery down the leg, paſſes over the internal part of the pulley, and is loſt in ſmall filaments, and anaſtomoſes with a branch of the peroneal nerve, on the inner ſide of the metatarſus; the other branch runs down on the peroneal ſide of the leg, along the deep ſeated flexors of the toes, paſſes in a ſheath formed for it on the outer edge of the moveable pulley of the heel, and proceeds under the flexor tendons along the metatarſal bone, to be diſtributed to the internal part of the two external toes.

The *peroneal nerve* is directed to the outer part of the leg; it dips in above the gaſtrocnemii muſcles, and runs through the ſame ligamentous pulley that tranſmits the tendon of the biceps muſcle; it then detaches ſome large filaments to the muſcles on the anterior part of the leg, under which it divides into two branches, which proceed cloſe together, in company with the anterior tibial artery, to the fore part of the ankle joint, at which place they ſeparate; one paſſes ſuperficially over the outer part of the joint; the other goes firſt under the tranſverſe ligament which binds down the tendon of the tibialis anticus muſcle on the tibia, and then over the inner part of the joint, below which it divides into two branches, the one is diſtributed to the inner ſide of the metatarſus and the tibial ſide of the pollex and to the next toe; the other turns towards the centre of the metatarſal bone, and penetrates the tendon of the tibialis anticus juſt at its inſertion, and then rejoins the branch of the peroneal nerve it accompanied down the leg. They continue their courſe together again in the anterior furrow of the metatarſal bone; and at the root of the toes, ſeparate once more, and proceed to the interſpaces of the three anterior toes, and each divides into two filaments, which run along the ſides of the toes to the nail.

Organs of Touch.

As the ſenſe of touch is beſtowed upon animals to enable them to diſcern the forms and ſtates of aggregation of external matter, it reſides more eſpecially in the extreme parts of their bodies, and when moſt perfect, exiſts in ſome member which is conſtructed for including or taking hold of extraneous ſubſtances. There is no part of the body of birds capable of conveying an accurate impreſſion of touch, but the feet and the bills; their upper extremities and tail being ſimply inſtruments of motion. Different ſpecies enjoy this in different degrees, and poſſeſs it more or leſs in the bill or feet, in proportion as they employ theſe parts in the purſuit or examination of their food; theſe being the only occaſions on which birds exerciſe their functions of touch. The *ſcanſores*, *accipitres*, and *paſſerine* tribe have moſt ſenſation in their feet, while the *grallæ* and *anſeres*, eſpecially thoſe that have long or broad bills for feeling out their food, like the *ſnipe*, or *duck*, poſſeſs a very great ſuſceptibility of impreſſion in their bills.

The organization of the feet of birds, as far as concerns their offices as inſtruments of touch, is ſimilar to that of the digitated mammalia and reptiles. The ſkin on their lower ſurfaces is endowed with more than common vaſcularity, is largely ſupplied with nerves, and is elevated into thoſe little regular eminences called *papillæ*, in which the ſenſe of touch more immediately reſides.

The ſtructure, on which the ſenſibility of the bill depends, is different from the preceding. It conſiſts in the magnitude and diſtribution of the fifth pair of nerves. Theſe are divided, as in mammalia, into three branches, the *ophthalmic*, the *ſuperior maxillary*, and the *inferior maxillary*.

The *ophthalmic* enters the orbit by a hole beſide the optic foramen, paſſes for ſome way in an oſſeous canal before it arrives in the naſal cavity, where it diſtributes ſome branches to the ſeptum and turbinata, and to the external nares, and then goes on as two branches; one runs in the ſubſtance of the upper jaw, which it perforates at the end in many filaments, to terminate under the horny integument of the bill; the other paſſes between the membrane of the palate and the bill, and is loſt in a number of fibrils at the apex of the bill.

The *ſuperior* and *inferior maxillary* nerves come out of the cranium by the ſame hole. The *ſuperior*, after diſpenſing branches to the muſcles in its courſe, is finally diſtributed to the lateral parts of the bill, which, if notched along the edge, as in ſome water birds, each denticulation receives ſeveral filaments. The *inferior maxillary* deſcends to the lower jaw, which it penetrates, after ſending a branch to the integuments of the ſide of the bill; and running in the maxillary canal, ſends filaments to the edge of the bill, and terminates, like the ophthalmic, on the apex of the lower mandible.

Theſe nerves are of great ſize in the *gooſe*, *duck*, &c. in which they render the bill a very delicate organ of touch. See *Plate* X. in the *Anatomy of Birds*. *Fig.* 4. is the ſection of the head of a *duck*, made by dividing the organ of ſmell longitudinally, and by removing the bill and bone of the mandible, in order to bring into view the diſtribution of the fifth pair of nerves: *a a* the ophthalmic nerve coming from the upper part of the orbit, and proceeding along the ſeptum naſi; *b* the branch which paſſes in the ſubſtance of the mandible, to be loſt on the point of the bill, *c* the branch that runs on the membrane of the palate to the end of the bill; *d* the ſuperior maxillary nerve dividing on the membrane of the palate, and ſending its filaments to the denticuli on the ſide of the bill; *e* the inferior maxillary running

ning in the canal of the lower jaw, and ſending filaments to the denticuli on the edge of the mouth, and ending on the point of the bill; *f* the naſal branch of the ophthalmic diſtributed to the ſeptum.

External Parts, or Integuments.

The *feathers* with which the bodies of birds are clothed, render them leſs capable of receiving the more ſimple impreſſions of touch, than moſt other animals. They alſo ſerve to defend them againſt the exceſſes of temperature. The ſtructure and mode of growth of theſe ſubſtances are conſidered in another part of the dictionary. See FEATHERS.

The *cuticle* of birds is remarkably thin, but reſembles in ſtructure the epidermis of mammalia. It is ſhed generally along with the feathers.

The *rete mucoſum* is not obſervable, except in thoſe parts which are uncovered by feathers, and poſſeſs peculiar colours, as the ceres and caruncles of the head, the feet, and bills; where it is of courſe found to vary in colour as thoſe parts do.

The *cutis* is in moſt birds extremely thin and delicate in its texture, appearing often like a fine ſingle lamina, inſtead of an intermixture of fibres as in mammalia. It is, however, of ſome ſtrength in the *water birds* and the *accipitres*; it is thinneſt in the *paſſeres*. The external part of the cutis is never *papillated*, but when it covers the under ſurfaces of the toes which are deſigned to receive the impreſſions of external bodies.

The *muſcles of the ſkin*, in conſequence of the ſize of the external coverings, are in general very evident, and particularly in thoſe birds which move the feathers of the creſt, neck, or tail, as the *hoopoes*, *cockatoos*, *herons*, *&c.*

The following cutaneous muſcles are common to all birds. Two fleſhy ſlips, which ariſe from behind each ſide of the head behind the meatus auditorius, and go backwards to be loſt in the integuments. A thin expanſion of muſcle along the anterior and lateral parts of the neck; it takes a longitudinal courſe, but is connected with ſome tranſverſe fibres between the jaws; this muſcle correſponds with the *platyſma myoides*. There is a muſcle, ariſing in a ſerrated manner from two or three of the lower ribs, and extending upwards to the axilla and outſide of the ſhoulder. We have perceived, in the *gooſe*, a very thin ſlip of muſcle proceeding from the poſterior part of the branch of the pubis to the ſkin on the inſide of the knee; and Cuvier conſiders the red granular appearance under the ſkin on the back of the pelvis as muſcular ſubſtance.

The functions of the ſkin of birds, as an organ of abſorption and excretion, appear to be very imperfect. The clothing of feathers alone diſqualifies it in a great degree for the performance of theſe proceſſes. The thinneſs and ſimple organization of the ſkin itſelf render it probable that its ſecretory powers are but inconſiderable. It does not alſo poſſeſs thoſe various glands which are ſo abundantly beſtowed upon the ſkin of other animals for its preſervation and defence againſt the operation of external ſubſtances. Birds are, however, provided with two peculiar glands for the purpoſe of furniſhing an oily fluid, to keep the feathers in order and defend them againſt the effects of moiſture.

The *oil glands* are two oblong or oval-ſhaped bodies, with one end more pointed than the other, and ſituated under the ſkin on each ſide of the ſpinous proceſſes of the caudal vertebræ. They approach each other, and touch at their points, which are directed backwards, and thus produce very commonly between them the figure of a heart. They are covered by a ſtrong denſe white tunic, and their interior ſtructure conſiſts of a number of ſmall tubes arranged in a radiated manner around a vacancy, or canal, which runs nearly in the middle of the gland, into which they all open and diſcharge their contents, in the ſame way as the tubuli uriniferi do into the pelvis of the kidney. The middle canal leads to a papilla on the ſkin of the rump, and terminates in a ſimple foramen. It deſerves remark, that the tubes towards the circumference of the glands are ſoft and indiſtinct, and their contents are liquid and pale coloured; but before their termination, the tubes acquire more firmneſs, are a little ſeparated into packets, their ſecretion becomes an opake yellow, and of more conſiſtence; thus affording an obvious and intereſting view of the change which may be wrought upon ſecreted fluids after their formation, while they are paſſing through their glands. The fluid produced by the glands on the rump of birds, although of an unctuous nature, is ſtill not pure animal oil. It has more conſiſtence, and is leſs affected by heat; which properties it principally acquires in the ends of the tubes, before they open into the common duct, as already mentioned. It is, however, ſufficiently oleaginous to prevent the adheſion of moiſture to the ſurface of the feathers. When birds make uſe of it, they turn their head round to the rump, and compreſs the glands with the bill, when a quantity of oily matter exſudes, with which they beſmear their feathers, arranging the barbs upon their ſhafts at the ſame time by means of the bill. Theſe glands, as might be preſumed from their uſe, are particularly large in the *ſwimming birds*. See *Plate* X. in the *Anatomy of Birds*. *Fig.* 5. ſhews the oil glands of the *duck* of their natural ſize: *a a* the two glands; *b b* their foramina on the papilla, into each of which a briſtle is introduced; *c c* the integuments reflected on each ſide to bring the glands into view. *Fig.* 6. of the ſame plate is a ſection of one of the oil glands ſomewhat magnified; *a* the canal in the centre into which the radiated tubes open; *bb* the external portion of the tubes; *cc* the interior extremities more diſtinct, and of a deeper colour.

Organ of Smell.

The ſhape and ſituation of the *noſtrils* are uſed by naturaliſts as claſſific characters of birds; and therefore do not require particular conſideration here. They conſiſt of two ſlits, varying in the length and width, commonly placed on each ſide behind the baſe of the bill. There are no muſcles provided for dilating and contracting their aperture, as in mammalia.

The interior of the organ of ſmell is formed by a ſeptum and three turbinated bodies, over which the pituitary membrane is ſpread.

The *ſuperior turbinatum* aſſumes in general the ſhape of a bell; it is formed of cartilage, and is attached to the os frontis and lacrymale; it is hollow within, and divided by a ſlight prominence into two apartments, which are continued for a little way in a tubular form; the external ends by a blind extremity behind the middle turbinatum; the internal opens into the cavity of the noſe. The ſuperior turbinatum is ſmall in the *paſſeres* and *gallinæ*, ſomewhat larger in the *ſcanſores*, increaſes in bulk in the *accipitres*, and ſtill more in the *anſeres*, and in the *grallæ* it is greateſt of all. According to the obſervations of Scarpa, the acuteneſs of ſmell is exactly proportioned to the magnitude of this part of the organ, as it is upon it only and the ſeptum that the olfactory nerve is ſpread.

The *middle turbinatum* has been likened by Scarpa to a cucurbite. It is connected on the external part to the cartilaginous pinna of the nares and the bony proceſs of the upper jaw, and inferiorly it is attached to the cartilaginous ſeptum of the noſe. It is compoſed of a cartilaginous lamina, which in the *gooſe* makes two folds and an half; but in the *grallæ* it is compreſſed, and forms only one turn and an

half. Harwood has ſtated theſe turbinata to be membranous in the *caſſowary* and *albatroſs;* and Cuvier has obſerved them to be compoſed of bone in the *toucan* and *hornbill.*

The *inferior turbinatum* is an oſſeous fold, continued from the pinna of the nares, and united on the other ſide to the ſeptum. See *Plate* X. in the *Anatomy of Birds. Fig.* 7. exhibits the interior of the naſal cavity of the *gooſe*, the ſeptum being removed; *a* the canal through which the olfactory nerve paſſes to the noſe; *b* the cavity of the ſuperior turbinatum; *c* its internal tube; *d* the external tube; *e* the middle turbinatum; *f* its deep or firſt winding; *g* the ſecond; *h h* two pins paſſed from the windings into the naſal cavity; *i* the inferior turbinated bone; *k* its junction with the ſeptum; *l* the cartilaginous appendix of the middle turbinatum; *m* a pin introduced through the external naris; *n* the poſterior naris.

The *pituitary* membrane is fine where it inveſts the ſuperior turbinatum, and thicker and more villous over the middle one; it is covered with pores, which diſcharge mucus on its ſurface. The blood veſſels on the interior of the noſe are beautifully reticulated.

The *olfactory nerve*, as already deſcribed, ariſes from the point of the hemiſphere of the cerebrum, and paſſes through an oſſeous canal to the ſuperior part of the naſal cavity. On arriving there it breaks into a great number of filaments, ſome of which are ſpread upon the ſuperior turbinatum, and others run about as far on the ſeptum naſi. See *Plate* X. in the *Anatomy of Birds, fig.* 4. *g* the nerve proceeding along the canal above the orbit; *h* the appearance of the nerve on the ſeptum of the *duck;* and *fig.* 8. of the ſame plate exhibits a ſection of the head of the *heron*, a bird with an acute ſenſe of ſmell; *a* the trunk of the olfactory nerve; *b* its diſtribution on the ſuperior turbinatum, which is very large; *c c* the middle turbinatum proportionably reduced in ſize; *d* inferior turbinatum; *e* its connection with the ſeptum; *f* the aperture of the external naris.

Scarpa made a number of experiments with different ſpecies of birds, in order to determine their capacity for diſcerning odours. He mixed various ſtrong ſmelling ſubſtances with their ordinary food, which in ſome were taken with indifference, but in others the repugnance to the ſcented food was ſo great, that the birds periſhed rather than eat it. He was thus enabled to form a ſcale of the different degrees of perfection in which birds enjoy the ſenſe of ſmell, which accorded exactly with the extent of the ſurface allowed for the diſtribution of the olfactory nerves. The ſcale he has laid is as follows: *gallinæ*, *paſſeres*, *picæ*, *anſeres*, *accipitres*, and *grallæ*.

Organ of Taſte.

The ſenſe of taſte is ſo imperfect in moſt birds, that it might be doubted whether it exiſted at all or not. The form and motions of the tongue unfit it for being applied to the ſuperficies of ſubſtances; the glairy tenacious fluid, with which the ſurfaces of their mouths are beſmeared, is not calculated for the ſolution of ſapid bodies; and the ſhape and ſtructure of the papillæ of the tongue ſeem to render them nearly incapable of impreſſion; and further it may be obſerved, that birds commonly ſwallow their food without examination, or a minute diviſion of its parts.

The motions and internal formation of the tongue have been already diſcuſſed; it only remains, therefore, to notice the figure and integuments; but as theſe have been deſcribed by natural hiſtorians in almoſt every genus, it is only neceſſary to ſpeak of them in a very general way at preſent.

The *form* of the tongue may be commonly gueſſed at from the ſhape of the bill, with which it correſponds in a certain degree. In the *gallinæ* and *paſſeres* it is an elongated triangle, the point being turned forwards; in the *grallæ* it is generally of the ſame figure, the triangle being however lengthened in proportion to the bill; the broad-billed birds, as the *ſwan*, *gooſe*, *&c.* have the tongue broad and round at the end.

The *parrot* has a thick round fleſhy tongue, not unlike that of mammalia.

Several birds have the tongue biſid at the point.

The *African oſtrich* has a broad tongue, but ſo ſhort, that its exiſtence has been often doubted. The *New Holland oſtrich* has a very thin ſmall tongue, and nearly an equilateral triangle.

The *papillæ*, or projecting points of the integument of the tongue are very various in their ſhape and arrangement. In moſt inſtances the tongue is ſmooth, except at its baſe, where it is furniſhed with ſharp reflex papillæ, which are commonly cartilaginous, and often covered with bone. In many birds there are proceſſes along the upper ſurface or the edge of the tongue, which are inveſted with a horny or oſſeous ſubſtance. The *vulture* has cartilaginous ſerræ along the edges of the tongue. The *toucans* have fine horny briſtles along the ſides, which give their tongue a reſemblance to a feather.

On the lateral parts of the back of the tongue of the *flamingo*, there are two rows of bony proceſſes, ſhaped like hooks, with their points turned backwards.

The *duck*, *gooſe*, *ſwan*, *&c.* have, beſides ſharp briſtles and denticulations, ſome rows of little oſſeous plates with their thin edges turned toward the fauces.

Birds have frequently the edges of the poſterior nares, and other prominent parts of the fauces furniſhed with reflected ſpiculæ, ſimilar to thoſe on the tongue; from which it is probable, that both are intended to aſſiſt in the action of ſwallowing the food, rather than to receive the impreſſions of ſapid ſubſtances.

The *parrot* is the only bird which appears to taſte its food, and hence it poſſeſſes ſoft papillæ, of which ſome are really *fungiform.*

It is probable, that the *humming* birds poſſeſs the ſenſation of taſte, as their tongue is flexible and tubulated, through which they ſuck, like inſects, their fluid aliment.

Organ of Hearing.

Birds are unprovided with the *concha*, or that external projection of the ear which is obſerved in man and quadrupeds, for collecting the rays of ſound; but to compenſate for the want of it, ſome of the internal parts of the organ are formed upon a larger ſcale. The feathers are arranged in ſome ſpecies, however, around the meatus auditorius in ſuch a way as to produce, in a degree, the effect of the concha. This is moſt obſervable in the *owls*, in which alſo the membrana tympani lies at the bottom of a cavity, which is lined by a reflection of the common integuments that forms folds ſomething analogous to the projections of the human concha; and in the *white owl*, there is a ſquare membrane, which ſerves as an operculum to the anterior part of the cavity.

The *frame* of the membrana tympani, or the bone which ſurrounds it, is more prominent in ſome birds than in others; but generally it does not project ſufficiently to deſerve the name of a canal. It is imperfect anteriorly, where the articular bone is ſituated, to which the membrana tympani is in part attached. In the *white owl*, however, the oſſeous frame of the meatus is completed by the bones of the head alone.

The *membrana tympani* is always more or leſs of an oval figure. It poſſeſſes the ſame ſtructure as in mammalia, but is very thin; the convex, or conic ſurface, is external,

external, instead of pointing inwards, as in man and quadrupeds.

The *cavity of the tympanum* is irregular on the internal surface, and is widest at its outer part. Besides the usual foramina leading to the labyrinth and Eustachian tube, it contains three others which communicate with the cells of the bones of the cranium. These are widened into something like canals, where the holes open into them. The largest of the foramina is in the back of the tympanum, and leads to the posterior cells, and communicates above the foramen magnum with the cellular canal of the other side. The second opening is placed at the anterior part of the tympanum, and conducts to the cells on the lower and anterior part of the cranium. The third foramen is continued amongst the cells which surround the labyrinth. Thus the cavities of each tympanum have a communication with the interior of all parts of the cranium, and with each other, from which they might be reckoned as making only one cavity. The end of the articular bone also, where it contributes to form the parietes of the tympanum, has a foramen, by which it derives its supply of air. The *auditory* cells of the cranium of birds are analogous to the mastoid of the human subject; but from their extent, multiply found much more. They are of the greatest magnitude in the *nocturnal birds of prey*, and especially in the *white owl*; the *goat sucker* (*caprimulgus*) has them also very large. They diminish in the other birds, in which the posterior canals have no direct communication with each other. They are little observable in the *struthiæ*; and the *parrot* appears to want them altogether, but in their place the cavity of the tympanum is enlarged posteriorly.

The *Eustachian tube* is very large in birds; it is an osseous canal, and terminates by a small aperture close to the one of the other side, within the fissure of the posterior nares.

The foramina, which lead into the labyrinth, are situated within a fossa. They do not merit the distinctions of *foramen ovale* and *foramen rotundum*, being both oval, and only separated by a small bony process.

The *ossicula auditus* are suplied by a single bone and some cartilaginous processes. The ossiculum consists of a stalk or pedicle, crowned by an oval plate, which is applied to the foramen that leads into the vestibule of the labyrinth. At the other extremity it becomes extended and united to two or three cartilaginous processes, which form a triangle that is attached to the membrana tympani.

The pediculated bone of the tympanum is moved by *one muscle*, which comes from the occiput behind the ear, and penetrating the cavity, is affixed to the triangle that is connected to the membrana tympani. This muscle is a *tensor*, and draws the membrana tympani outwards. It is counteracted by two small tendinous cords that are extended to the internal parietes of the tympanum.

The *labyrinth* of the ear of birds consists only of the *vestibule* and *three semicircular canals*, and the rudiment of the *cochlea*.

The *vestibule* is small in proportion to the other parts.

The *canals* have been termed by Scarpa, from their gradation in bulk, *canales major*, *minor* and *minimus*. The largest is most superior, and has a vertical position. The smallest is situated horizontally. The canalis minor ascends upon the major, and opens into its side. They contain corresponding tubes of vascular membrane; and they also possess the *ampullæ*, on which the nerves are distributed in the same manner as in mammalia.

The place of the *cochlea* is supplied by a short osseous *tube*, very slightly bent, and either blunt or enlarged at the extremity. Its interior is occupied by two small cylinders of fine cartilage, each a little twisted, and united at their origin and termination. They proceed from the osseous bar, which separates the two foramina that correspond to the foramen ovale and rotundum. The sulcus, which is left between the cartilages, is dilated near the point, and accommodates the same branch of the auditory nerve which is sent to the cochlea in mammalia. This nerve spreads in fine filaments upon the united extremity of the cartilaginous cylinders. The tube is divided by the presence of the cartilages into two scalæ, which communicate with the vestibule and the foramen rotundum.

The *struthious birds* have the tube corresponding to the cochlea, very small in proportion to the other parts.

The *auditory nerve* is received into a fossa, and there breaks into five branches; one is the *facial*, or *portio dura*, and the others are sent to the semicircular canals and the tube. The facial nerve receives a filament from the par vagum, which traverses the ear, and is afterwards distributed to the palate.

Comparetti has described two canals leading from the labyrinth of birds, which correspond with the *aqueducts* of the ear of mammalia.

For the illustration of the organ of hearing, see *Plate* X. in the *Anatomy of Birds*. *Fig.* 9. represents a dissection of the posterior portion of the skull of the *white owl* (*strix flammea*), which exposes both the parts of the tympanum and the labyrinth: *a* the membrana tympani, which is inclosed in a perfect frame of bone in this bird; *b* the cavity of the tympanum laid open on the other side of the head; *c* the pediculated bone, or ossiculum, in situ; *d d d* the semicircular canals; *e* the tube analogous to the cochlea; *f f* the air-cells exposed by the division of the cranium. *Fig.* 10. shews the ossiculum and the membrana tympani abstracted from their situation and magnified; *a a* the membrane; *b* the flat head or disk of the ossiculum; *c* the pedicle; *d* the extremity which unites with the cartilages, and forms the triangle that is connected to the membrana tympani. *Fig.* 11. exhibits a magnified view of a dissection of the labyrinth of the *goose*, in which the membranous parts and the distribution of the nerves are displayed; *a* the trunk of the auditory nerve; *b* the portio dura; *c c c* the three branches of the portio mollis going to the semicircular canals; *d* the nerve of the cochlea running in the sulcus, and ramifying on the apex of the cartilages; *e* the osseous part of the tube analogous to the cochlea; *f* the inferior cartilaginous cylinder; *g* the sulcus between it and the superior, which is concealed from view by the nerve; *h h h* the three ampullæ of the membranous semicircular canals; *i* the canalis major; *k* the canalis minor; *l* its communication with the major; *m* the canalis minimus; *n* the hole which corresponds to the foramen ovale. *Fig.* 12. is the cartilaginous body removed from the osseous tube; *a* the superior cylinder; *b* the inferior; *c* their junction where they commence; *d* the cavity at the apex of the cylinders laid open; *e* the nerve of the cochlea; *f* its expansion in the cavity of the apex of the cartilaginous body.

Organ of Sight.

The peculiarities in the structure of the eyes of birds are chiefly intended to facilitate the perception of objects through a rare medium, and accommodate vision to different distances.

The *form of the eye* is admirably adapted in most species to promote both these effects. The anterior circle of the globe of the eye always projects more than in other animals; and in many species it is prolonged in a tubular form, and in those cases the cornea also is remarkably gibbous. The *owl* furnishes the most striking example of the disproportion between the anterior and posterior spheres of the eye. The

axis of the anterior portion being twice as great as that of the other. The obvious consequence of this figure of the globe of the eye is to allow room for a greater proportion of the aqueous fluid, and for the removal of the crystalline lens from the seat of the sensation, and thus produce a greater convergence of the rays of light, by which the animal is enabled to discern the objects placed near it, and to see with a weaker light; and hence *owls*, which require this sort of vision so much, possess the structure fitted to effect it in so remarkable a degree.

The *sclerotic coat* of the eye in birds is thin and flexible on the posterior part, but anteriorly its form is maintained by the interposition of a number of bony plates between its layers. These vary from thirteen to twenty, and are arranged in a circle immediately behind the cornea, with their edges overlapping each other. They are commonly flat thin scales, and nearly of a square figure, but become elongated from before backwards in proportion as the bird possesses the power of changing the convexity of the cornea. In the *owls* the scales compose not only all the projection of the eye (the cornea excepted), but contribute to form the posterior sphere. The scales are capable of a degree of motion upon each other, which is, however, restrained within certain limits by the attachments of their anterior and posterior edges to the sclerotic coat; and by their being bound together with a tough ligamentous substance, which seems to be the continuation of the sclerotic between the edges that overlap each other.

The *cornea* possesses the same structure as in mammalia, but differs with respect to form. When the posterior part of the eye is compressed by the muscles, the humours are urged forwards and distend the cornea; which, at that time, becomes much more prominent in most birds than it is ever observed in mammalia; and under such circumstances, the eye is in a state for perceiving near objects. When the muscles are quite relaxed, the contents of the eye-ball retire to the posterior part, and the cornea becomes flat, or even depressed; this is the condition in which we always find the eye of a dead bird, but we can have no opportunity of perceiving it during life. It is only practised for the purpose of rendering objects visible that are placed at an extreme distance. From the well known effects of form upon refracting media, it must be presumed, that the cornea possesses very little, if any, convexity, when a bird, which is soaring in the higher regions of the air, and invisible to us, discerns its prey upon the earth, and descends with unerring flight to the spot, as is customary with many of the rapacious tribe.

There are other circumstances in the anatomy of the eye of birds, which have been supposed to concur with the extraordinary variation in the figure of the cornea, in producing its capacity for the perception of remote objects: these will be mentioned in their proper place.

The *choroid coat* differs in no material point from that of the human subject. The *ciliary processes* of the choroides are very small and short; being merely serrated striæ. There appears to be no *tapetum*.

The *iris* is sometimes of brilliant colours, which are employed by naturalists as distinguishing specific characters of birds. *Parrots* have the power of voluntarily producing a great degree of motion in the iris. It does not appear, however, that other birds are capable of commanding the motions of this part.

The *pecten*, or *plicated membrane*, is the most singular part of the structure of the eye of birds. It appears to grow from the choroides where the optic nerve penetrates that coat; but on closer inspection it is found to have no intimate connexion with it. In structure, however, it is perfectly similar to the choroides. The form of this part varies in different species; in general, it consists of a membrane folded backwards and forwards on itself, like the plaits of a garment, and presenting, when viewed on the side, something of the appearance of the teeth of a comb; on which account the name of *pecten* has been applied to it. In the *struthious birds*, the folds of the pecten are larger, and collected towards the point, giving it a resemblance to a purse. The Parisian academicians therefore, in taking their description of this part from the *ostrich*, called it the *marsupium nigrum*, by which name it is still very commonly known. The plicated membrane proceeds into the substance of the vitreous humour, and usually becomes attached to the posterior part of the capsule of the crystalline lens a little to one side. In some instances it does not come into immediate contact with the capsule of the lens, but ends a very short way behind it amongst the cells of the vitreous humour: such is the case in the *turkey*, *jackdaw*, and several other birds. The number of the folds of the pecten vary. There are sixteen in the *stork*, fifteen in the *ostrich*, and seven in the great *horned owl*.

The functions of the plicated membrane have been often discussed, but still remain involved in some degree of doubt. Haller, and others, consider it as the medium through which the vessels are conducted to the crystalline lens; but there appears no reason for such a provision to exist in birds. Petit was of opinion that it absorbed the lateral rays of light, in order that objects placed immediately before the eye might be more distinctly seen; which is highly improbable, as the scope of vision is full as extensive in birds as in other animals. The best supported theory on this subject is Mr. Home's. The plicated membrane, according to his experiments, possesses a contractile power, and affords the means of withdrawing the lens from the anterior part of the eye, when the organ is adapted to the perception of remote objects; thus acting in concert with the change of figure in the cornea. Experiments, however, upon the operations of the eye are so delicate in their nature, that they are seldom to be relied upon, and accordingly in different hands they have afforded very different results; but the doctrine of the muscularity of the plicated membrane is almost proved by its seeming necessity for the explanation of the powers of adaptation of the eyes to different distances, which birds possess in a degree far superior to all other animals; and it seems fair to infer that if the accommodation of vision depends upon the motion of the cornea, and the recession of the lens in those animals which are so eminently endowed with it, similar means are employed for the same purpose in the other classes which possess the faculty in a less degree. For the more ample discussion of this subject, see Mr. Home's lectures on muscular motion, published in the Philosophical Transactions for the years 1794, 1795, and 1796; Dr. Olbers' "De oculi mutationibus internis," Gotting. 1780; "The Essays of Petit, Mem. de l'Acad." 1735, p. 163. 1736, p. 166; "Observations on the Eyes of Birds," by Mr. Pierce Smith, Phil. Trans. for 1795; and "Dr. Young's Lecture on the Mechanism of the Eye," Phil. Trans. 1801.

The *optic nerve* passes through an oblique sheath in the back of the sclerotic coat, during which it changes from a round to a flattened shape, and as such, enters the eye, presenting on the inside an elongated white line, instead of a round disk, from which the retina is produced. The origin of the plicated membrane covers the entrance of the optic nerve.

The *humours* as well as the shape of the eye and the structure

ture of its coats, indicate the peculiar vision of birds and the kind of medium they inhabit. The *aqueous humour*, as already observed, is extremely abundant. It possesses considerable refractive powers especially in the higher regions of the atmosphere. The *crystalline* is remarkably flat and soft, as its offices can be so well supplied by the aqueous fluid in a rare medium. Both the form and the proportions of the humours in the eyes of all birds derive great illustration from being compared with those of *fishes*, which, in consequence of their continual residence in so dense a medium as water, have these parts formed upon a plan the very reverse.—Their eye is flat anteriorly; the aqueous fluid small in quantity, and of considerable consistence; and the lens spherical and hard, more especially in the centre. The *cormorant* has the crystalline more spherical than other birds, from being obliged to seek its food under the water.

The *muscles* for the motion of the eye-ball are six in birds, as in the human subject; the four straight and two oblique. The tendons of the recti cannot be traced farther than the circle of imbricated bones. The operation of the straight muscles, when acting together upon the figure of the eye (which, as already observed, is so striking in birds), depends upon the bony scales of the anterior part of the sclerotic, and the thinness and pliability of that tunic posteriorly. The superior-oblique muscle does not pass through a pulley.

The *external eye-lids* are chiefly closed in birds by the elevation of the lower one, although there is an orbicular muscle which surrounds both. The inferior eye-lid is larger and thicker than the other, and contains internally an oval cartilaginous plate, under which the fibres of the orbicularis palpebrarum pass. There is also a peculiar muscle, which comes from the floor of the orbit, and acts as a *depressor* of the inferior eye-lid.

The *internal eye-lid*, or *membrana nictitans*, is a thin semi-transparent membrane, which lies close to the globe of the eye. It has a vertical position, and, when not employed, is folded back by virtue of its own elasticity, and remains concealed from view in the corner of the eye next the nose. It is, however, capable of being spread over the whole of the anterior part of the organ, by means of the combined action of two curiously contrived muscles. One of them is of a square figure, and thence called *quadratus*; it arises from the upper and back part of the eye-ball, and approaching the optic nerve, teminates abruptly in a circular edge, which contains a pulley for the passage of the tendon of the *pyramidalis*. This muscle arises from the side of the sclerotic next the nose a little inferiorly, and produces a fine tendon, which runs though the pulley formed in the free edge of the quadratus, and afterwards returns in a cellular sheath on the lower surface of the sclerotic, and becomes attached to the margin of the membrana nictitans, along which it is continued for some way, and gradually lost.

The *lacrymal gland* is small in most birds. The *glandula harderi* exists, and is larger than the lacrymal. Cuvier describes it as being generally situated between the adductor and levator muscles, and as having a single excretory duct, which perforates the membrana nictitans, and discharges upon its inner surface a yellow tenacious fluid. Many *water-birds* have a hard granular body placed at the superior part of the orbit, which seems to perform the office of a lacrymal gland; and although its excretory ducts have not been yet seen, it probably furnishes a fluid of a peculiar nature, for the defence of the eye against the effects of the water and other accidents to which aquatic birds are exposed.

The figures, which serve to explain the organization of the eye, are found in *Plate* XI. of the *Anatomy of Birds*. *Fig.* 1. shews the cornea and imbricated bony scales of the *goose*, as an example of the figure these parts commonly assume in birds. *Fig.* 2. represents the same parts in the *horned owl*, in which the cornea will be seen very prominent, and the scales greatly elongated, forming the fore part of the eye into a tube. *Fig.* 3. exhibits a lateral view of the crystalline lens and the plicated membrane in the *goose*'s eye; *a* the pecten attached to the posterior part of the lens a little to one side; *b* the edge of the lens marked by the ciliary processes; *c* the anterior part, which is particularly flat in birds. *Fig.* 4. shews the pecten and the lens in the relative situation they hold in the eye of the *turkey*; *a* the plicated membrane; *b* the lens; *c* the outline of the eye; *d* the optic nerve. *Fig.* 5. is a section of the eye of the *emeu*; *a a* the cut edges of the sclerotic coat; *b b* the edges of the choroides; *c* the retina; *d* the plicated membrane formed like a purse. *Fig.* 6. presents the anterior part of the eye of the *cassowary*, with the membrana nictitans partially drawn over it, which is so fine a film that the parts of the eye are seen through it. *Fig.* 7. is the posterior view of the *cassowary*'s eye, all the muscles, &c. being removed, but those for moving the membrana nictitans: *a* the musculus quadratus; *b* the pyramidalis at its origin; *c* its tendon passing through the pulley in the edge of the quadratus; *d* the tendon proceeding on the sclerotic coat.

Organ of Voice.

Until within these late years this part of the anatomy of birds has been involved in obscurity. Although several of the older anatomists described the structure by which birds produce sound, they were ignorant of its uses, from being misled by analogy, and supposing that this organ occupied the same situation in all animals. Even some of the descriptions of the ablest of the modern anatomists have been erroneous or imperfect. The subject has been most laboriously and ingeniously investigated by Cuvier. He dissected the organs of voice of more than one hundred and sixty species of birds, and published the result of his inquiries in two memoirs; the principal one will be found in the Magazin Encyclopedique. tom. 2, to which we would refer the reader for numerous and minute details, that would be burthensome to introduce into the present work.

The true seat of the organ of voice in birds is at the bifurcation of the trachea, and not, as general analogy would dictate, at the superior larynx, which is in birds little more than a simple rima, or slit, formed, however, with somewhat differently shaped cartilages than belong to the rest of the trachea, and furnished with muscles for opening and closing the aperture. The mechanism of the inferior larynx, which fits it for the production of sound, depends upon the figure of its cartilages, and the expansion of its membranous parts.

The two branches of the bronchiæ are composed of semi-rings of cartilage; the internal surfaces, or those opposed to each other, being membranous. The semi-rings next the trachea are often large, and always less curved than those near the lungs. The consequence of which is, that the membranous part of the bronchiæ becomes expanded in proportion to its distance from the lungs, and towards the bifurcation usually assumes an oval figure, to which Cuvier has given the name of the *tympaniform membrane*.

Where the bronchiæ open into the trachea, there is the appearance internally of the reed of a musical instrument. This is produced by a thin and elastic fold of the inner membrane, which projects upwards from each side. The aperture is divided into two, sometimes by an osseous bar extended across from before backwards, and sometimes merely by the angle produced by the union of the two bronchiæ.

When the air is expelled from the lungs and air-cells with force

force through the bronchiæ, a lively vibration is excited in the tympaniform membrane and the reed-shaped aperture, or glottis, upon which the production of the voice essentially depends.

The magnitude, figure, and proportions of the inferior larynx vary more or less in almost every species, which Cuvier has taken great pains to point out.

The trachea is commonly enlarged, at its bifurcation, by the expansion and union of its last cartilaginous rings, which is designed to afford strength to the voice.

In the *stare* and the *singing birds* the last rings of the trachea are united into a single piece, of which the base is wide, and furnished with two points that are joined by a transverse osseous bar in such a way, that the trachea communicates by two openings with each of the bronchiæ.

In the *parrot*, the last rings of the trachea are united, and form a tube a little compressed on the sides. The very last ring is almost square; it is also flattened before and behind, and furnished posteriorly with two points. There is no partition within. The sides of the bronchiæ, opposite to each other, are membranous. The first semi-ring is large, flat, and shaped like a crescent; the second, third, and fourth semi-rings unite in one piece; and the fifth, sixth, and seventh are consolidated into a similar plate. The edges of both, however, present the marks of their original parts.

In the *nocturnal birds of prey*, the last ring of the trachea is divided by a bone.

In the *scolopax rusticola*, the four last cartilaginous rings of the trachea are incomplete posteriorly, and the tympaniform membrane is continued up between them.

The male birds of the *duck* kind, and the genus *mergus*, have the last rings of the trachea united, and forming a cartilaginous or bony sack, called by authors the *ampulla*, or the *labyrinth*. This part, in the *mallard*, forms two dilatations; the one on the right is small, and resembles a truncated cone, with a prominence from the base behind. The left is a large vesicle irregularly rounded, and produces at the lower part a pyramidal projection. Its right surface is a little flattened below, and its inferior border is indented. The cavity is interrupted by projections, or septa, in such a manner, that the air cannot pass from the left bronchia into the trachea, but through the capsule, although on the right side it may. The entrance to the bronchiæ is provided with a thick membrane, under which there are some glands resembling the *synovial*, that secrete a mucous fluid.

The form and internal partitions of the ampullæ of the *drakes* of other species and the *merganses*, are different in every instance. Their deviations are described at length by Cuvier. See Memoire sur le larynx inferieur des oiseaux, Magazin Encyopedique, tom. 2d.

Two species of *vulture* (V. *papa* and V. *aura*) were observed by Cuvier to be deprived of the organ of voice, there being neither the tympaniform membrane, nor any contraction, or projecting elastic parts at the entrance of the bronchiæ into the trachea.

The voice of birds is modified, and the tones rendered more acute or grave, by means of two descriptions of muscles. The first are common to all species, and have been long known and described. They were called by Vic d' Azir the *inferior* or *external laryngeal*. They are two fleshy cords, and arise from the triangular processes of the sternum, to which the superior ribs are joined within the chest, and proceed to the side of the trachea, above the bifurcation, along which they ascend for its greatest length. Their effect is to depress the inferior larynx, and contract the bronchia, and thereby relax the tympaniform membrane, and deepen the tone of voice, and in some circumstances they may also bring the trachea forwards. These were the only muscles observed by Cuvier in the *gallinæ*, and most of the *anseres*. It is probable, that no others are to be found also in the *struthious* birds.

The second kind of muscles are confined to the inferior larynx; they are short, and situated upon each side of the bifurcation of the trachea; and, except in the *parrot* tribe, are all constrictors, or intended to render the tympaniform membrane tense, and thus exalt the tones of voice.

In most birds, which do not sing, there is but a single pair of constrictors, one on each side, which arises from some of the last rings of the trachea, and is inserted into some of the first semi-rings of the bronchia. These *muscles* are longest in the *nocturnal birds of prey*, extending from the base of the trachea to the seventh semi-ring. The constrictor is attached to the fifth semi-ring in the *cuckow*, the *heron*, and *bittern*. The latter birds owe their strength of voice to the elasticity of the semi-rings, and the extent of the tympaniform membrane. The *goat-sucker*, *king-fisher*, and *pelican*, have the constrictor muscle affixed to the second semi-ring of the bronchia; and the *woodcock*, *phalarope*, *coots*, and the *plovers*, and *recurvirostra*, and probably all the weak billed *grallæ*, have it inserted into the first semi-ring.

The larynx of *singing birds*, and some others, is provided with five constrictors on each side, which Cuvier has named, according to their situation and direction.

1. The *anterior longitudinal constrictor*.
2. The *posterior longitudinal constrictor*.
3. The *small longitudinal constrictor*.
4. The *oblique constrictor*.
5. The *transverse constrictor*.

These almost surround the bifurcation of the trachea, to which they have all the same attachments, as near as may be. The two first are inserted into the third semi-ring; the two next into the second semi-ring; and the last is affixed to the first semi-ring, and particularly to a little cartilage that is joined to it.

Cuvier has observed the five pair of constrictors in all the singing birds, in the *stare*, in all the *passeres*, except the *swallow* and *goat-sucker*, and in the *crow*, *raven*, *jay* and many of the *pie* kind.

The most complicated instrument of voice amongst birds, is that of the *parrot* tribe. It possesses three pair of muscles; but one pair is intended to relax the opening of the glottis.

The *principal constrictor* arises from the last ring but one of the trachea, descends almost perpendicularly upon the laxator, and then goes on to be inserted into the union of the fifth, sixth, and seventh semi-rings of the bronchia. Its attachment being joined to the semicircular plate, it urges the upper part of the plate inwards, and thus contracts the glottis.

The *auxiliary constrictor* occupies, for a certain distance, the anterior part of the trachea, and sends off a tendon, which is lost in the preceding muscle; its operation therefore, is exactly the same.

The *laxator* is placed under the two other muscles; it arises along the side of the trachea, and expands upon the inferior concave edge of the last ring; in drawing which outwards, the muscle enlarges the glottis.

See *Plate* XI. in the *Anatomy of Birds*. *Fig.* 8. shews the external appearance of the inferior larynx in the *owl*; *a* the lower part of the trachea; *b* the two bronchiæ; *c* the external laryngeal muscles, which are common to all birds; *d* the constrictor. *Fig.* 9. of the same plate exhibits the organ of voice in the *thrush*; *a* the anterior longitudinal constrictor; *b* the transverse constrictor partially exposed under

under it; *c* the posterior longitudinal constrictor, detached at one extremity, and turned outwards: and *Fig.* 10. affords another view of the same subject; the posterior longitudinal constrictor is turned down to expose those that lie behind it; *a* the little longitudinal constrictor; *b* the oblique constrictor. *Fig.* 11. of *Plate* X. represents the anterior part of the organ of voice in the *parrot*; *a* the principal constructor; *b* the auxiliary one; *c* the laxator: and *Fig.* 12. gives a lateral view of the same parts, which are indicated by corresponding letters.

The *trachea*, in several birds, is found to assume singular forms, and to suffer enlargements at particular places. These have long attracted the attention of naturalists. Some of the best observations on the subject have been made by Dr. Bloch of Berlin, and by Pallas, Silberschlag, Beckmann, and Otto, who have each published in the Berlin Transactions, see Besch. des Berl. Nat. Fr. i. ii. iii. & iv. But by far the most copious account of the peculiarities of the trachea of birds, has been given by Dr. Latham in the Linnæan Transactions, vol. iv. p. 90.

The deviations from the common structure of the trachea, have been divided by Dr. Latham into two kinds. In one the windpipe does not alter its capacity, but possesses an unusual length, which is disposed of either in convolutions on the outer part of the body underneath the integuments, or in a cavity formed within the sternum for the purpose. The other kind of deviation consists in dilatations occurring either at the bifurcation of the trachea, or both there and in the middle of the tube.

The trachea of the *wood grous*, when arrived at the crop, takes a bend upwards for a little way, and again turns down, and pursues its course to the lungs. There has been no peculiarity observed in the other birds of this genus which visit this kingdom.

In the *marail turkey (penelope marail.)* the trachea makes a round turn on the outside of the top of the sternum, and then enters the chest.

In the *male parraka pheasant*, the wind-pipe descends under the skin more than half the length of the body, before it returns to enter the thorax.

The *guan (penelope cristata)* has the trachea still longer than the preceding. It passes to the very bottom of the belly, and then turns up again, before it makes the double. See *Plate* XI. in the *Anatomy of Birds*, *fig.* 13.

The *Indian cock* was observed by the academicians to have a degree of convolution in the trachea, which varies somewhat in different individuals.

The *curassow curassow* has the most remarkable convolutions of the trachea. It first descends upon the right pectoral muscle to the end of the sternum, where it makes a convolution to the left, something in the shape of a ring, after which it returns to the right pectoral muscle, and goes over the clavicle into the thorax.

The *semi-palmated goose* of *New Holland* has an extensive convolution of the trachea under the skin. Its note is said to be very musical.

The *ardea virgo*, *the wild* or *whistling swan*, and the *crane*, have the winding of the trachea accommodated in the keel of the sternum. It is singular that this structure does not exist in the *tame swan*, which in other respects so much resembles the wild bird. See *Plate* XI. in the *Anatomy of Birds*. *Fig.* 14. shews those parts in the *wild swan*; *a a a* the sternum cut open to expose the cavity which lodges the trachea; *b b b* the trachea; *c c* the fork; *d d* the clavicles. The above structure belongs to both sexes.

The dilatations of the trachea are confined to two genera, *anas* and *mergus*; and, as already observed, are only to be met with in the male birds.

The bony enlargements at the bifurcation into the bronchia, which are called *ampullæ*, or *labyrinths*, exist in every species of duck and merganser. They consist of two cells, one in general much larger than the other. In some instances the parietes of the cells are in a great measure formed by a membrane spread across it, like the head of a drum. There is also a bony arch turned across to give strength. This is the case in the *scaup duck*, the *pochard*, *tufted duck*, the *smew*, *&c.* See *Plate* XI. *Fig.* 15. is the end of the windpipe of the *pochard (anas ferina)*.

The trachea of the *golden eye duck* is very curious. The labyrinth is more complicated than usual; and there is a singular enlargement in the middle, which is formed by cartilaginous joints, or plaits, placed obliquely, and folding over each other, so that the part admits of being contracted and lengthened, as the motions of the neck may require.

The *velvet duck* is distinguished by two very remarkable osseous enlargements, one is situated immediately below the superior larynx, and another in the middle of the wind-pipe. The lower part does not form the usual ampulla, but the bronchiæ become for a little way bony canals. See *Plate* XI. in the *Anatomy of Birds*. *Fig.* 16. represents the trachea of the *velvet duck*; *a* the *superior*, or laryngeal osseous cell; *b* the bony cavity of the middle; *c c* the osseous parts of the bronchiæ.

The *red-breasted merganser* has the middle of the trachea formed like that of the *golden eye duck*, only the plaits are made of bone, and curiously furrowed; indeed all the trachea of the mergansers, as Dr. Latham observes, consists of little else than bone.

A very little comparison of the mechanism of wind musical instruments with the organs of voice in birds, will shew how nearly they are allied to each other; and it may be observed, that the sound produced by some of the larger birds is exactly similar to the notes that proceed from a *clarionet* or *hautboy* in the hands of an untutored musician. The inferior glottis exactly corresponds to the reed, and produces the tone or simple sound. The superior larynx gives it utterance as the holes of the instrument; but the strength and body of the note depend upon the extent and capacity of the trachea, and the hardness and elasticity of its parts. The convolution and bony cells of the wind-pipe, therefore, may be compared with the turns of a *French horn*, and the divisions of a *bassoon*; and they produce the proper effects of these parts in the voices of those birds in which they are found.

Bird, in *Astronomy*, *Avis Indica*. See Apus.

Bird of *Phœbus*, the *Raven*, one of the southern constellations. See Corvus.

Birds, in *Ancient Augury*. Prescience, or knowledge of futurity, was supposed, among the ancients, a natural faculty of birds, owing, perhaps, to their nearer intercourse with heaven, or their breathing a purer and more celestial air than other animals. Hence it was, that divination by birds obtained among the ancient Greeks and Romans, being performed by observing, and interpreting the flight, chirping and feeding of divers birds. (See Augury.) Birds, with regard to augury and divination, were of divers kinds, viz. *Aves auspicatæ*, or *felices*, those which naturally portended good: such were the dove, swan, &c. *Aves inauspicatæ*, *diræ*, *ominosæ*, those which boded some evil or mischief: such were the kite, raven, crow, and owl, every where, except at Athens. *Admissiva*, that which excites and encourages the consulter to execute what he has in view. *Arciva* or *arcula*, that which forbad a thing to be done; otherwise called

called *clivia, clamatoria,* and *prohibitoria, inebra,* and *inhiba. Incendiaria,* that which gave omen of a fire, or other calamity; or which is seen carrying a firebrand from the funeral pile to a house. *Remora,* that which stays or delays an action. *Sinistra,* that on the left hand, denoted a happy or prosperous omen; and was also called *secunda, prospera. Alites,* those which gave omens by their wings and flight. *Oscines,* those by their singing or chirping. *Pulli,* by their pecking. *Præpetes,* those which by their flight, or perching, gave happy omens. *Inferæ,* or *inebræ,* those which in like manner gave ill omens.

Bird, William, in *Musical Biography.* This worthy and admirable scholar of the profound Tallis, is supposed to have been the son of Thomas Bird, one of the gentlemen of Edward the sixth's chapel, in which he was himself a singing-boy. By the great number of his ecclesiastical compositions to Latin words, and the several portions of the Romish ritual which he so frequently set to music, and published late in life, he seems to have been long a zealous adherent to that religion. He must, however, have conformed to the church establishments of queen Elizabeth's reign; for, in 1563, he was chosen organist of Lincoln cathedral, where he continued till 1569, when, upon the accidental death of Robert Parsons, who was drowned at Newark-upon-Trent, he was appointed gentleman of the chapel royal. Notwithstanding which office, he seems to have composed the chief part of his Choral Music to Latin words, and to have published it in that language, as late as the middle of the reign of king James I.

In 1575, it appears by the title-page of the "Cantiones Sacræ," and the patent annexed to that work, that he and Tallis were not only gentlemen of the royal chapel, but organists to her majesty queen Elizabeth. Indeed both must have been great performers on the organ, to have been able to play such of their pieces for that instrument as are still preserved; in which the passages, though awkward to performers who are only accustomed to modern music, must have been suggested by persons that were habituated to the complicated, and now, almost, invincible difficulties of the sixteenth century. And though the compositions for keyed-instruments by these great masters of harmony, are totally unimpassioned, and without grace, it is impossible not to regard their ingenuity and contrivance in the texture of the parts, with respect and wonder!

If we consider the elaborate style of composition which prevailed, particularly in the church, during the time of Bird, and that he, like his master Tallis, was not only ambitious of vanquishing its usual difficulties in the construction of fugues and canons, but sought new complications, perplexities, and involutions in the motion and arrangement of the parts, the following list of his works will not only manifest diligence, but fecundity.

Besides the great share he had in the "Cantiones Sacræ," published in conjunction with his master Tallis, in 1575, when his name first appears as an author; and without enumerating many admirable compositions for the church and chamber, still subsisting, but which were never printed, or, at least, not till after his decease, he published "Psalms, Sonnets, and Songs of Sadness and Pietie," of five parts, 1588; "Liber primus sacrarum Cantionum, quinque vocum," 1589; "Songs of sundrie Natures, some of Gravitie, and others of Myrth, fit for all Companies and Voyces," 1589; "Gradualia ac Cantiones Sacræ, Lib. primus et secundus," 1607 and 1610. The last work published by himself, was entitled, "Psalms, Songs, and Sonnets: some solemne, others joyful, framed to the Life of the Words, fit for Voyces or Viol, of three, four, five, and six partes," 1611. Dr. Tudway's collection, in the British Museum, contains a whole service in D minor, by Bird, with responses, and the anthems, "Sing joyful unto God,"—"O Lord, turn thy Wrath,"—(all published in the second and third volumes of Dr. Boyce's Cathedral Music.)—"O Lord, make thy Servant;" "Save me, O God;" "Prevent us, O Lord;" "Civitas sancti tuo," one of his Sacrarum Cantionum, or Sacred Songs, published 1589, has been long sung in our cathedrals to the English words, "Bow thine ear, O Lord," and is one of the admirable pieces of harmony in the second volume of Boyce's printed collection.

Dr. Aldrich, who was a great admirer and collector of the works of Bird, and who adapted English words to most of his compositions which have been used in our cathedrals, and that were originally set to parts of the Romish service, in Latin, has bequeathed to Christ Church, Oxon, beautiful and correct copies of most of his productions, in a set of books, small 4to. In this library near forty of his compositions are preserved; and in another set, many more, with those of Tallis, Taverner, Tye, White, Redford, both the Mundys, Shepherd, Bull, and other contemporary English masters.

Bird's pieces for the organ and virginals are almost innumerable. In a magnificent folio manuscript, curiously bound in red morocco, formerly in Dr. Pepusch's collection, which is generally known by the name of "Queen Elizabeth's Virginal Book," there are near 70 of his compositions.

The first piece by Bird, in this book, and the eighth in the collection, is a Fantasia, which generally implies a Fugue, in which the subject is as frequently changed as in ancient Choral Music, where new words require new accents and intervals; for as yet, it was not the custom in composing fugues to confine a whole movement to one theme: and here Bird introduces five or six, wholly different and unconnected with each other.

The subject of the second composition, by Bird, in the Royal Virginal Book, is the tune of an old ballad, "John come kiss me now;" of which, with great labour and ingenuity, he has varied the accompaniments sixteen different ways; for while the treble, base, or some inward part, is always playing the original air, three other parts are moving in fugue, or running rapid and difficult divisions. No. 52, is another Fancie; and 56, a Pavan, by Bird; which implied a grave majestic dance, in common time, similar to the movement of the peacock. This strain was usually followed by the Galliard; which, on the contrary, was a gay and lively dance, in triple time, but on the same [illegible] the preceding Pavan. No. 58, is entitled, "The [illegible]an's Whistle." From No. 58 to 69, the compositions are all by Bird; consisting chiefly of old tunes, with variations; among which is "Fortune," a plaintive and expressive melody, to which the ballad, called "Titus Andronicus's Complaint," inserted in Reliques of ancient English Poetry, vol. i. p. 204, was originally written. It has been imagined that the rage for variations, that is, multiplying notes, and disguising the melody of an easy, and, generally, well-known air, by every means that a *spacca nota,* or note splitter, sees possible, was the contagion of the last century; but it appears from the Virginal Book, that this species of influenza, or corruption of air, was more excessive in the sixteenth century, than at any other period of musical history.

Crowded and elaborate as is the harmony, and uncouth and antiquated the melody, of all the pieces in this collection by various composers, there is a manifest superiority in those of Bird over all the rest, both in texture and design. In a later age his genius would have expanded in works of invention, taste, and elegance; but, at the period in which he

he flourished, nothing seems to have been thought necessary for keyed-instruments, except variations to old tunes, in which all the harmony was crowded, which the fingers could grasp, and all the rapid divisions of the times, which they could execute. Even nominal fancies were without fancy, and confined to the repetition of a few dry and unmeaning notes in fugue, or imitation. Invention was so young and feeble, as to be unable to go alone; and old chants of the church, or tunes of the street, were its leading-strings and guides.

Though the reformation had banished superstition from the land, fragments of *canto fermo*, like rags of popery, still remained in our old secular tunes, and continued to have admission in the new. Indeed the melodies of all the rest of Europe had no other model than the chants of the church, till the cultivation of the musical drama; whence all the rhythm, accent, and grace of modern music, have manifestly been derived.

Besides the great number of Bird's compositions for keyed-instruments, which are preserved in the Virginal Book of queen Elizabeth, another manuscript collection of his pieces still subsists, under the title of "Lady Nevil's Music Book." It is a thick quarto, very splendidly bound and gilt, with the family arms beautifully emblazoned and illuminated on the first page, and the initials H N at the lowest left hand corner. The music is all written in large, bold characters, with great neatness, on four staved paper, of six lines, by Jo. Baldwine, a singing-man at Windsor, and a celebrated copyist of queen Elizabeth's time. The pieces contained in this collection, sixteen of which are entered in that queen's virginal book, amount to forty-two, with variations to many of them, of the most laboured and difficult kind. The notes, both white and black, are of the lozenge form, like those of the printed music of the same period.

Lady Nevil seems to have been the scholar of Bird, who professedly composed several of the pieces for her ladyship's use.

None of Bird's pieces for keyed-instruments seem to have been printed, except eight movements in a thin folio book of lessons that was engraved on copper, and published in the reign of king James I. under the following title: "Parthenia, or the Maidenhead of the Musicke that ever was printed for the Virginalls. Composed by three famous masters: William Bird, Dr. John Bull, and Orlando Gibbons, gentlemen of his majestyies most illustrious chappel." These lessons, though not equally difficult with some of those in the Virginal Books of queen Elizabeth and lady Nevil, are rather more dry and ungraceful.

The canon, *Non nobis Domine*, appears in none of his works published by himself, or collected by others, before the year 1652; when Hilton inserted, and prefixed the name of Bird to it, in a collection of catches, rounds, and canons. But as no claim was laid to it by, or in favour of, any other composer, before or since that time, till about the middle of the last century, when it was given to Palestrina by Carlo Ricciotti, who published, in Holland, among his concertos, a fugue in eight parts, on the same subject, there seems no doubt remaining of our countryman Bird having been the author of that pleasing and popular composition.

Bird died in 1623, surviving his master Tallis thirty-eight years; and if we suppose him to have been twenty in the year 1563, when he was chosen organist of Lincoln, he must have been eighty at his decease. Peacham, in his Complete Gentleman, speaks of him with great reverence; "For Motets and Musicke of piety and devotion, as well for the honour of our nation, as the merit of the man, I preferre above all others our Phœnix, Master William Byrd, whom in that kind I know not whether any may equall. I am sure none excell, even by the judgement of France and Italy, who are very sparing in their commendation of strangers, in regard of that conceipt they hold of themselves. His Cantiones Sacræ, as also his Gradualia, are meere angelicall and divine; and being of himselfe naturally disposed to gravity and piety, his veine is not so much for light madrigals or canzonets; yet his Virginella, and some others in his first set, cannot be mended by the first Italian of them all." *Second Impression*, p. 100. His pupil, Morley, in his *Introduction*, every professor and musical writer of his own and later times, never mention him but with the highest respect. At this remote period but little, however, can be known of his private life, which was too studious and sedentary to have furnished history, at any time, with events of general interest. With respect to what Ant. Wood asserts in his Fasti, that "Bird was excellent in mathematics," it is, in his usual way, supported by no proof; and indeed mathematics have so little to do with practical music, either in composition or performance, that those musicians, who are most ignorant of the ratio or philosophy of sounds, seem constantly to have arrived at the highest degree of excellence in the selection, combination, and refinement of them in practice, by the mere assistance of experience, and the gift of good ears and powerful nerves. That he was a diligent cultivator of his art appears from his numerous works, which are more the productions of meditation and study than of haste and enthusiasm. That he was pious, the words he selected, and the solemnity and gravity of style with which he set them, sufficiently evince. Of his moral character, and natural disposition, there can, perhaps, be no testimonies more favourable, or less subject to suspicion, than those of rival professors, with whom he appears to have lived during a long life with cordiality and friendship. And, of the goodness of his heart, it is, to us, no trivial proof, that he loved, and was beloved, by his master, Tallis, and scholar, Morley; who, from their intimate connexion with him, must have seen him *en robe de chambre*, and been spectators of all the operations of temper, in the opposite situations of subjection and dominion.

Indeed, the best memorials of a professional man's existence are his surviving works; which, from their having been thought worthy of preservation by posterity, entitle him to a niche in the Temple of Fame, among the benefactors of mankind. The physician who heals the diseases, and alleviates the anguish of the body, certainly merits a more conspicuous and honourable place there; but the musician, who eminently soothes our sorrows, and innocently diverts the mind from its cares during health, renders his memory dear to the grateful and refined part of mankind, in every civilised nation.

BIRD *cherry*, in *Botany*. See PRUNUS *Padus*.

BIRD's *eye*. See ADONIS.

BIRD's *foot*. See ORNITHOPUS.

BIRD's *foot trefoil*. See LOTUS.

BIRD's *nest*, a name used by some for the daucus, or carrot; and by others for ophrys.

BIRD's *nest purple*. See ORCHIS.

BIRD *pepper*. See CAPSICUM.

BIRD's *tongue*. See SENECIO.

BIRDS, *Canary*. See CANARY *birds*.

BIRD of the *wise*, among *Alchemists*, is the philosophical mercury; and, in general, sublimations or substances spiritualized by the separation of their terrestrial part.

BIRD, *golden*, the hermetic matter partly matured.

Bird, *green*, the philosopher's stone, at the time when its green colour appears.

Birds, *Cyprian*, *aves Cypricæ*, or *aviculæ Cypriæ*, is a denomination given to a kind of odorous candles, made of the matter of troches, and burnt for the sake of their fumes, called also, from their figure, *baculi*, or *sticks*.

Bird *of Hermes*, *avis*, or *avicula Hermetica*. Alchemists speak much of that which flies in the night without wings. Some will have the *avicula Hermetica* to be an universal salt prepared from dew.—It also denotes red-lead.

Birds, *decoy*, are those which are trained up to call and allure others into the fowler's nets, snares, lime-twigs, or the like. See Decoy.

Birds, *Humming*. See Humming-*bird*.

Birds, in *Domestic Economy*, and in reference to their use as aliments. See Fowl.

Bird, in *Falconry*, denotes a hawk, or falcon. See Falcon. *Nides birds*, *aves nidulariæ*, denote those taken while in the nest. *Ramage birds*, *arborariæ aves*, are those only arrived at strength sufficient to fly from branch to branch. *Hagard bird*, is that which has lived at liberty, and is thence more wild and untractable. *Bird of the fist*, is that which having been reclaimed, returns to, and perches on the hand, without the help of a lure. *Bird of lure*, signifies that which comes to the lure, and by that means to the hand. *Bastard bird*, a hawk, for instance, bred of a hawk and a lanier; or a saker, bred of a saker and a lanier. *Coward birds*, those which only pursue their game for their own belly, and which are not to be reduced to just sport; as ravens, kites, &c.

Bird, in *Geography*, the name of a small island in Dunmannus bay, in the county of Cork, Ireland.—Also, another small island in Strangford lough, and county of Down.—Also, one of the Bermudas islands.—Also, a small island in the gulf of St. Lawrence, 21 leagues W. of cape Anguilla on the island of Newfoundland. N. lat. 47° 55′. W. long. 60° 45′.—Also, an island in the southern Pacific Ocean, discovered by capt. Cook, in 1769, in his voyage from Cape Horn to Otaheite, covered with verdure, and inhabited. S. lat. 17° 48′. E. long. 216° 24′.—Also, an island in the southern Pacific Ocean, near the north-west coast of the island of New Georgia, discovered by capt. Cook in 1775. S. lat. 54°. W. long. 38° 22′.—Also, an island of the same ocean, discovered, in 1788, by the commander of the Prince of Wales, and so called from its being the resort of many birds. This solitary island, or rather single rock, rising out of the immense ocean, was particularly examined by Vancouver in 1794. Its greatest extent, in a direction S. 74 W. and N. 74 E. did not exceed one mile; and its northern, eastern, and western extremities, against which the sea broke with great violence, presented a very awful appearance, rising perpendicularly from the ocean in lofty rugged cliffs, inaccessible except to its winged inhabitants; on its southern side the ascent is not so steep and abrupt; and near its western extremity is a small sandy beach, where, in fine weather, and with a smooth sea, a landing might probably be effected. At this place was the appearance of a little verdure, though it was destitute of tree or shrub; every other part was apparently without soil, and consisted only of the naked rock. The whole circumference does not exceed a league, and it is situated in N. lat. 23° 6′. E. long. 198° 8′. It lies from Onehow, one of the Sandwich islands, N. 51 W. at the distance of 39 leagues; it is recognized by the natives of those islands under the appellation of "Modoo Mannoo," that is, bird island; and from its great distance from all other islands, and its proximity to their islands, it seems to claim some pretensions to be ranked in the group of the Sandwich islands; which see.—Also, a small island near the north-east coast of New Holland, lying low and almost covered with birds; 4 leagues N. W. from cape Grenville. For other islands under this denomination; see Aves.

Bird *fort*, an American fort on Monongahela river; 40 miles south of Fort Pitt.

Birds-*Key*, or *Round island*, a small island, or rock, among the Virgin islands, in the West Indies; 2 leagues S. of St. John's island; and 3 N. E. from St. Croix, or Santa Cruz. N. lat. 17° 55′. W. long. 64° 36′.

Birds, *Message*, *aves internunciæ*, denote those that are employed to convey letters or other dispatches, either for the sake of expedition or safety. See Carrier-pigeon and Aleppo.

Bird, *mocking*, the *turdus polyglottus*; which see. See also Mock *bird*.

Bird-*bolt*, in *Heraldry*, is a small arrow with a blunt head, and often represented in armory, with two and sometimes three heads rounded, but in that case the number of heads must be noticed.

Bird-*call*, a small stick cleft at one end, in which is put a leaf of some plant, that serves to counterfeit the call of several birds, and to bring them to the net, snare, &c. by which they are taken. A laurel-leaf fitted on the bird-call counterfeits the voice of lapwings, a leek, that of the nightingale, &c. See Call and Bird-*catching*.

Bird *Catching*, in its most comprehensive sense, denotes the art of taking birds or wild-fowl, either for food, or for enjoying the pleasure of their song in cages, or for preventing the destruction which some species of them occasion to the husbandman. Some recur to it as an amusing pastime, and others practise it as a profitable employment; and with a view to one or other of these objects, various modes of taking birds have been adopted, and the practice is in some places reduced to a kind of system. One of these methods is denominated Bat-Fowling, or, as some term it, *Bat-folding*. For this purpose, five or six persons commonly provide themselves with a large net, expanding, when open, to the extent of a man's arms, and about three yards high, and formed of meshes so small as not to allow the escape of the smallest bird. The extremities of the net are attached to two poles, held one in each hand of the person who has the management of it. With this, and a large lanthorn affixed to a pole, the party proceeds to corn-fields, out-houses, yew-hedges, thatched buildings, &c. The cords of the net being separated to their utmost extent, it is placed before any spot where birds are supposed to roost, and the light being held before the centre of the net, the assistants in this operation beat the hedges, ricks, eaves, &c. with poles; and the birds, thus alarmed, fly towards the light, upon which the person who holds the net claps its poles together, and encloses the birds. From the latter circumstance, the net is called a *clap-net*. Sparrows, larks, thrushes, and the other small birds, are thus caught in great numbers in dark nights. Another method of bat-fowling, is performed by means of a long net drawn over the ground, followed by a person bearing a light; and this net, in its passage, encloses and confines any birds that happen to be under it. But one of the most ingenious and systematic methods of bird-catching, is practised principally in the vicinity of London, by persons who find a ready market for birds used as food, or who deal in song-birds, which, at certain seasons of the year, change their situation, and are hence denominated birds of flight, in the language of this art. The birds usually taken on such occasions, are wood-larks, titlarks, linnets, aberdavines, gold-finches, and green-finches. They are principally

pally taken during what is called their flight, or while they congregate for the purpose of propagating their species. The wild birds begin to fly in the month of October, and part of the preceding and following months; and the flight in March is much less considerable than that of Michaelmas. It is to be noted also, that the several species of birds of flight do not appear exactly at the same time, but follow one another in succession. The pippet, which is a small species of lark, inferior in its song to other birds of that genus, begins his flight, every year, about Michaelmas; and then the wood-lark, linnet, gold-finch, chaffinch, green-finch, and other birds of flight succeed; all of which are not easily to be caught, or in any numbers, at any other time, particularly the pippet and the wood-lark. These birds, during the Michaelmas and March flights, are chiefly on the wing from day-break to noon, though there is afterwards a small flight from two till night; but this is so inconsiderable, that the bird-catchers always take up their nets at noon. Another circumstance worthy of notice is, that, during their flitting, they always fly against the wind; hence the bird-catchers eagerly contend for that point; so that if it be westerly, the bird-catcher, who lays his nets most to the east, is sure almost of catching every thing, provided that his call-birds are good: a gentle wind to the south-west generally produces the best sport. The nets used by the bird-catchers are about 12 yards long, and 2½ wide; which are known in most parts of England by the name of "day-nets," or "clap-nets," but the best are those that are used in the neighbourhood of London. These nets are spread upon the ground parallel to one another, and at such a distance, that when turned over, they shall coincide. The remaining apparatus consists of lines so fastened to the nets that the bird-catcher is able, by a sudden pull, to draw the net over the birds that may have alighted in the space between their parallel sides. These birds are enticed to alight by others usually denominated "call-birds," of which there are generally five or six linnets, two gold-finches, two green-finches, one woodlark, one red-poll, a yellow hammer, a titlark, and an aberdavine, and perhaps a bull-finch. These are placed at small distances from the nets in little cages. Besides these, the bird-catcher has others called "flur-birds," which are placed within the nets, raised upon the flur, and gently let down at the time the wild birds approach them. This "flur" is a moveable perch to which the bird is tied, and which the bird-catcher can raise or depress at pleasure, by means of a long string fastened to it. These flur-birds generally consist of the linnet, the gold-finch, and the green-finch, which are attached to the flur by what is called a "brace," which secures the birds without injuring their plumage. This brace is a sort of bandage, formed of a slender silken string, that is fastened round the body of the bird, and under the wings in such a manner as to prevent the bird's being hurt, however it may flutter when it is raised. The call-birds are particularly trained for the service to which they are appropriated. Accordingly, the bird-catchers contrive to improve the song of these birds, by causing them to moult before the usual time. For this purpose, they put them, in June and July, into a close box, under two or three folds of blankets, and leave their dung in the cage to increase their heat; and in this state they continue, being, perhaps, examined once a week to have fresh water. The air of the cage is so putrid, that they want little or no food, as they eat scarcely any thing during the whole period of their confinement, which is about a month. The birds frequently die under this operation; and on this account the "stopped bird," as it is called, is the more valuable. When the bird hath thus prematurely moulted, he is "in song," while the wild birds are "out of song;" and his note is louder and more piercing than that of a wild one; and his plumage is by this process equally improved. The black and yellow in the wings of the gold-finch, for example, become deeper and more vivid, and acquire a very beautiful gloss, which is not to be seen in the wild bird. The bill, which in the latter is likewise black at the end, becomes in the "stopped bird" white and more taper, as are also its legs; and, in short, there is as much difference between a wild and a stopped bird, as there is between a horse, which is kept in body cloths, and one at grass. When the bird-catcher hath laid his nets, he disposes of his "call-birds" at proper intervals; and Pennant observes, that a malicious joy appears in these call-birds, to bring the wild ones into the same state of captivity; and this is also the case with regard to the decoy ducks. After they have seen or heard the approach of the wild birds, which they observe long before it is perceived by the bird-catchers, the intelligence is announced from cage to cage, with the utmost ecstacy and joy. The note, by which they invite them down, is not a continued song, like what the bird uses in a chamber; but "short jerks," as they are called by the bird-catchers, which are heard at a great distance. So powerful is the ascendency of this call over the wild birds, that the moment they hear it, they alight on a spot, within twenty yards of three or four bird-catchers, which otherwise would never have attracted their notice. It also frequently happens, that if, by pulling the string, half a flock only should be caught, the others who have escaped, will immediately return to the nets, and share the fate of their companions; and if only one bird should escape, that bird will still venture into the scene of danger, till it be caught; such is the fascinating power which the call-birds possess with regard to the others. A bird, acquainted with the nets, is by the bird-catchers termed a "sharper;" and this bird they endeavour to drive away, as they can have no sport, while it continues with them. These sportsmen frequently lay considerable wagers, whose call-bird can "jerk" the longest, as this circumstance determines their superiority. With this view, they place them opposite to each other, near an inch of candle, and the bird that jerks the oftenest, before the candle is burnt out, wins the wager. Some birds have given 170 jerks in a quarter of an hour, and a linnet has been known, in such a trial, to persevere in its emulation, till it swooned from the perch; thus, as Pliny (l. x. c. 29.) says of the nightingale, "victa morte finit sæpe vitam, spiritu prius deficiente quam cantu."

It is observable, that bird-catchers immediately kill the hens of every species of birds they take, as they are incapable of singing, and inferior in plumage. The pippets, likewise, are indiscriminately destroyed, as the cock does not sing well. The dead birds are commonly sold for threepence or four pence a dozen. The flesh of these is regarded as a delicate acquisition at the tables of the luxurious; and yet the taste for small birds is far from being so prevalent in England as it is in Italy, where they are eaten under the name of "beccaficos." However, the luxury of the modern Italians will appear to be parsimony, when compared with the extravagance of their predecessors the Romans. (See *Clodius Æsop.*) The highest price given for singing birds in London, Mr. Pennant informs us, is about five guineas; this sum having been paid for a chaffinch, that had a particular and uncommon note, under which it was intended to train others, and five pounds ten shillings have been given for a call-bird linnet.

Mr. Pennant informs us, that when the titlarks are caught in the beginning of the season, it frequently happens, that 40 are taken without one female; the case is the same with the wheatear, and probably with respect to other birds: and this

this circumſtance confirms the obſervation of Linnæus, that the male chaffinches fly by themſelves, and the flight precedes the females; and the fact extends to other birds. Such birds as breed twice a year have generally in their firſt brood a majority of males, and in their ſecond of females.

As the bull-finch, though it is not properly either a ſinging bird, or a bird of flight, its range being merely from hedge to hedge, fetches a good price on account of its learning to whiſtle tunes, and as it ſometimes flies over the fields where the bird-catchers lay their nets, they have often a call-bird to enſnare it, though moſt of them can imitate the call with their mouths. It is a peculiarity with regard to this bird, that the female anſwers the purpoſe of a call-bird, as well as the male, which is not to be experienced in any other bird taken by the London bird-catcher. The nightingale, though diſtinguiſhed as a ſinging-bird, moves only from hedge to hedge, and does not take the periodical flights of other birds in October and March; and therefore it is not claſſed by the bird-catchers among the birds of flight. The perſons who catch theſe birds, make uſe of ſmall trap-nets, without call-birds, and are conſidered inferior in dignity to other bird-catchers, who will not rank with them. The arrival of the nightingale is expected by the trappers in the neighbourhood of London the firſt week in April; at firſt, none but cocks are taken, but in a few days the hens make their appearance, generally by themſelves, though ſometimes a few males come along with them. They are caught in a net-trap, the bottom of which is ſurrounded with an iron-ring; and the net itſelf is ſomewhat larger than a cabbage-net. When the trappers hear or ſee them, they ſtrew ſome freſh mould under the place, and bait the trap with a meal-worm from the baker's ſhop. In this way ten or twelve nightingales have been caught in a day. Pennant's Zool. vol. ii. Append.

Birds are caught in traps of various kinds; and frequently by nooſes of hairs. In this way, great numbers of wheat-ears are annually taken on the various downs of England. Small holes are dug by the ſhepherds in the ground, in each of which is placed a nooſe. Whenever a cloud obſcures the ſun, theſe timid birds ſeek for ſhelter under a ſtone, or creep into any holes that preſent themſelves; and they are thus enſnared by the nooſes which faſten around their necks. Woodcocks and ſnipes are taken likewiſe by nooſes of horſe-hair placed along their paths, in marſhes and moiſt grounds. Wild ducks in all their varieties are taken in vaſt numbers every winter on our coaſts by means of decoys. (See Decoy.) Grouſe and partridges are taken by means of nets, either at night when reſting on the ground, by obſerving where they alight, and when ſetted, drawing a net over that part of the field; or, in the day, a very ſteady dog is uſed to point at them. The attention of the birds being thus fixed, two perſons, drawing the two extremities of a large net, paſs it over them, and thus ſecure a whole pack of grouſe, or covey of partridges at once. Pheaſants are ſometimes taken by night, by holding flaming ſulphur under the trees on which they are obſerved to perch, the ſuffocating effluvia of which make them fall ſenſeleſs. Mons. Pratty informs us, that, during his travels in North America, he took great numbers of the paſſenger-pigeon in a ſimilar manner. For various methods of taking larks; ſee Alauda. For the uſe of bird-lime among bird-catchers; ſee Bird-Lime.

In various parts of the world, peculiar modes are adopted for enſnaring and taking birds, ſome of which, whilſt they are hazardous to thoſe who practiſe them, excite no inconſiderable degree of ſurpriſe, and even of anxiety, in the ſpectators. Thus, in the Orkney iſlands, where the birds that inhabit the rocks, and the eggs which they depoſit among the cliffs, ſupply the principal food of many among the poorer inhabitants, the intrepid and adventurous fowlers climb rocky precipices more than fifty fathoms above the ſea, and paſs from one ſhelf or ledge to another, whoſe breadth is barely ſufficient for reſting places to the birds, which depoſit their eggs upon them. In this hazardous employment, the adventurers are commonly lowered from above by means of a rope, formed often of brittle materials, and held by a ſingle aſſiſtant. Faſtened to this rope, the intrepid peaſant deſcends, and ſearches all the cavities for eggs, ſpringing from one projecting ledge to another, by the help of a pole, whilſt the aſſiſtant, upon receiving the neceſſary ſignals, ſhifts the rope from one part of the rocky precipice to another. If the weight of the fowler and of his booty ſhould, in theſe perilous circumſtances, overpower his aſſociate above, or the craggy rock cut the rope, inevitable deſtruction muſt await the adventurer; for he will either be daſhed againſt the projecting rock, or drowned in the ſubjacent ſea. But the moſt ſingular ſpecies of bird-catching is in the holm of Noſs, which is a huge rock ſevered from the iſle of Noſs by ſome unknown convulſion, and diſtant from it about 16 fathoms. The oppoſite cliffs are ſeparated by the raging ſea. The adventurer, having reached the rock in a boat, and aſcended to the top of it, faſtens ſeveral ſtakes in the ſhallow ſoil that is found on the ſurface of the rock; and ſimilar ſtakes are alſo attached to the edge of the correſponding and oppoſite cliff. A rope is then fixed to the ſtakes on both ſides, upon which a machine, called a cradle, is contrived to ſlide; and by the help of a ſmall parallel cord faſtened in like manner, the daring adventurer wafts himſelf over, and returns with his booty.

In the Feroe iſlands the method of bird-catching is more extraordinary and hazardous than any which has already been recited. The cliffs, to which the fowlers recur, are in many caſes 200 fathoms high; and they are traverſed both from above and below. In the firſt caſe, the fowlers provide themſelves with a rope 80 or 100 fathoms long; and the adventurer faſtens one end about his waiſt and between his legs, and having recommended himſelf to the protection of the Almighty, he is lowered down by ſix aſſociates, who place a piece of wood in the margin of the rock, that the rope may be preſerved from being fretted and broken by its ſharp edge. To his body is faſtened a ſmall line, which ſerves for enabling him to give the neceſſary ſignals, when he wiſhes to be raiſed or lowered, or ſhifted from one place to another. In changing his ſituation, he is expoſed to the hazard of injury from looſened and falling ſtones, which, falling on the head, muſt inevitably deſtroy him, if he were not in ſome degree protected by a ſtrong thick cap. The fowlers, by their aſtoniſhing dexterity, contrive to place their feet againſt the front of the precipice, and to dart themſelves ſome fathoms from it, for the purpoſe of ſurveying the roofting places of the birds, and projecting themſelves into the deep receſſes, where they lodge. There the fowler alights; and diſengaging himſelf from the rope, which he fixes to a ſtone, collects the booty at his leiſure, attaches it to his girdle, and when this is done, reſumes his ſuſpended poſture. He will alſo, when occaſions require it, ſpring from the rock, and in this attitude, by means of a fowling net, fixed to the end of a ſtaff, catch the old birds which are flying to and from their retreats. When this hazardous operation is finiſhed, he gives a ſignal to his companions above, who pull him up, and divide the booty. The feathers are preſerved for exportation; the fleſh is partly eaten freſh, and the greater

greater part is dried for winter's provision. In fowling from below, the party have recourse to a boat, and when they have arrived at the base of the precipice, one of the most intrepid of them fastens a rope about his waist, and being furnished with a long pole, with an iron hook at one end, either climbs, or is thrust up by his companions, who place a pole under him, to the next footing spot within his reach. By means of the rope he hoists up one of the boat's crew; and the rest are drawn up in the same manner, each of them being furnished with his rope and fowling-staff. They then pursue their journey upwards till they arrive at the region of birds; and they wander about the cliff in search of them. They next act in pairs; one fastens himself to the end of his associate's rope, and, in places where birds have nestled beneath his footing, he suffers himself to be lowered down, depending for safety on the strength of his companion, by whom he is again hauled up; but it sometimes happens, that the person above is overpowered by the weight, and in this case, both inevitably perish. The fowl is flung into the boat, which attends their operations, for the purpose of receiving the booty. The fowlers often pass seven or eight days in this perilous occupation, and lodge in the crannies which they find in various parts of the precipice.

In some remote parts of Russia there is practised a singular invention for taking great quantities of gelinottes or grous. They choose the most open places in the birch woods; and there they plant long forks in the earth opposite the larger trees. On these forks is laid a horizontal stick, gallows-wise, to which are tied small bundles of ears of corn. At a small distance from this part of the contrivance, is a kind of large funnel, or inverted cone, made with long birch twigs, thin and flexible, the lower extremities of which are stuck in the earth, very near to one another; but by spreading towards the top, forms there an opening of above a yard in diameter. In this opening is placed a wheel made of two circles that intersect each other, and are surrounded with straw and ears of corn. This wheel turns on an axis fastened to the sides of the funnel in such a manner, that there is room enough between the sticks of the cone, and the circles, to admit of the wheel's turning freely about. The birds first perch upon the transverse stick near the tree; and when they have a mind to fall upon the corn tied to the wheel, they must necessarily stand upon one of the projecting parts of the circles of which it is composed. At that instant the wheel turns, and the gelinotte falls, head foremost, to the bottom of the trap, which is there so contracted that he cannot get out. They sometimes find the machine half full of gelinottes.

The following method of netting or catching of wild pigeons is eagerly pursued as a diversion in different parts of Italy, particularly by the inhabitants of Cava, in the Hither Principato, and is thus described by Mr. Swinburne. The people "assemble in parties; and if any stranger chances to stray to their rendezvous, give him a most cordial welcome. I am not in the least surprised (says Mr. Swinburne), at their passionate fondness for this sport, as I found it extremely bewitching, keeping the attention constantly alive, and the springs of the mind pleasingly agitated by expectation; the situations where the toils are spread are incomparably beautiful, the air is pure and balsamic, and every thing around breathes health and satisfaction. When the periodical flights of stock-doves return from the northern and western parts of Europe, to gain warmer regions for their winter abode, the fowler repairs to the mountain, and spreads his nets across the intermediate hollows, the passes through which the birds direct their course, to avoid unnecessary elevation in their flight. These nets are hung upon a row of large trees planted for the purpose. The branches being very thick and close at top, and the bore lofty and bare, a great opening is left below for the toils, which reach to the ground; and, by means of pulleys, fall in a heap with the least effort. Sometimes they are extended upon poles that exceed the height of the trees. At a small distance is a lofty circular turret, like a column with a little capital or cap, upon which a man is stationed to watch the approach of the game. As he commands a free view over all the country, and practice has made his sight as acute as that of the lynx, he descries the birds at a wonderful distance. The doves advance with great velocity; but the alert watchman is prepared for them; and just as they approach his post, hurls a stone above them with a sling: upon this the whole flock, whose fears have birds of prey for their great object, supposing the stone to be an enemy of that kind ready to pounce them, dart down like lightning to avoid the blow by passing under the trees; but there they rush into the jaws of death, by dashing against the net, which instantly drops, and so entangles them that not one of them can escape the active hands of the fowler. These birds are sometimes taken by dozens at one fall, and are accounted fine eating. The dexterity with which the slingers manage their weapon is very remarkable; they throw the stone to a great height without any violent effort, and even without whirling the sling round before they discharge the pellet. In the Pyrenean mountains, where the same diversion is followed, the watchmen use a bow and arrow, trimmed with the feathers of a hawk."

The following simple but ingenious method of catching aquatic birds is used in Mexico by the natives. The lakes of the Mexican vale, as well as others of the kingdom, are frequented by a prodigious multitude of ducks, geese, and other water-birds. The Mexicans leave some empty gourds to float upon the water, where those birds resort, that they may be accustomed to see and approach them without fear. The bird-catcher goes into the water so deep as to hide his body, and covers his head with a gourd; the ducks come to peck at it; and then he pulls them by the feet under water, and in this manner secures as many as he pleases.

Sir George Staunton, in his "Embassy to China," (vol. ii. p. 400.) informs us, that water-fowl are taken upon the Wee-Chaung-hoo lake in that country by a similar device. Empty jars or gourds are suffered to float about upon the water, that such objects may become familiar to the birds. The fisherman then wades into the lake with one of those empty vessels upon his head, and walks gently towards a bird; and lifting up his arm, draws it down below the surface of the water, without any disturbance or giving alarm to the rest, several of which he treats in the same manner, until he fills the bag which he had brought to hold his prey. This contrivance is not so singular as it is that the same device should have occurred in the New Continent, as Ulloa asserts, to the natives of Carthagena, upon the lake Cienega de Tesias.

Birds, *fishing with*, is a singular mode of fishing practised in some of the lakes of China, and particularly described in the account of the late embassy. Upon a lake near the imperial canal were observed thousands of small boats and rafts, constructed for this singular kind of fishing. On each boat or raft were ten or twelve birds, which, at a signal from the owner, plunged into the water; and it was astonishing to observe the enormous size of the fish with which they returned, grasped within their bills. These birds appeared to be so well trained, that it did not require either ring or cord about their throats, to prevent their swallowing

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any portion of their prey, except what the maſter was pleaſed to return to them for encouragement and food. The boat uſed by theſe fiſhermen is of a remarkable light make: and is often carried to the lake, together with the fiſhing birds, by the men who are there to be ſupported by it. The bird trained for this purpoſe is a ſpecies of pelican, deſcribed by Dr. Shaw, from a ſpecimen ſubmitted to his inſpection, as "the brown pelican or corvorant, with white throat, the body whitiſh beneath and ſpotted with brown, the tail rounded, the irides blue, the bill yellow." Staunton's embaſſy to China, vol. ii. p. 388.

Bird *lime*, a viſcid ſubſtance, prepared various ways, and from various materials, for the catching of birds, mice, and other vermin.

The bird-lime ordinarily uſed among us is made from holly-bark, boiled ten or twelve hours. When the green coat is ſeparated from the other, it is covered up a fortnight in a moiſt place, then pounded into a rough paſte, ſo that no fibres of the wood be left, and waſhed in a running ſtream till no motes appear, put up to ferment four or five days, ſkimmed as often as any thing ariſes, and laid up for uſe. To uſe it, a third part of nut oil, or any thin greaſe, is incorporated with it over the fire.

The miſletoe affords a juice even ſuperior to that of the holly; and if a young ſhoot of the common elder be cut through, a ſtringy juice will draw out in threads, and follow the knife like bird-lime, or the juice of holly. It ſeems in this tree to be lodged, not in the bark, but in certain veins juſt within the circle of the wood. The roots of all the hyacinths alſo afford a tough and ſtringy juice of the ſame kind, and ſo do the aſphodel, the narciſſus, and the black bryony root, in a ſurpriſing quantity.

The bird-lime brought from Damaſcus is ſuppoſed to be made of ſebeſtins, their kernels being frequently found in it: but this does not endure either froſt or wet. That brought from Spain is of an ill ſmell: that of the Italians is made of the berries of miſletoe, heated, mixed with oil, as before; to make it bear the water, they add turpentine. It is ſaid, the bark of our *viburnum* or wayfaring ſhrub makes bird-lime as good as the beſt.

Bird-lime is a ſubſtance very apt to be congealed, and rendered unſerviceable by froſts; to prevent which it is proper, at the cold ſeaſons, to incorporate ſome petroleum with it, before it is uſed. The method of uſing it is to make it hot, and dip the ends of a bundle of rods in it; then to turn them about and play them together, till a ſufficient quantity is extended over them all. If ſtrings or cords are to be limed, they are to be dipped into the bird-lime, while very hot. The cords may be put in cold, but the rods ſhould be warmed a little. Straws are to be limed while the matter is very hot: a large bundle of them ſhould be put in at once, and worked about in it, till they are well beſmeared. When thus prepared, they ſhould be preſerved in a leather bag till they are uſed. When the twigs or cords are to be put in places ſubject to wet, the common bird-lime is apt to have its force ſoon taken away: it is neceſſary, therefore, to have recourſe to a particular ſort, which, from its property of bearing water unhurt, is called *water-bird lime;* and is prepared thus: Take a pound of ſtrong and good bird-lime, waſh it thoroughly in ſpring-water, till the hardneſs is entirely removed; and then beat it well, that the water may be ſeparated from it; then dry it well, and put it into an earthen pot; add to it as much capon's greaſe as will make it run. Then add two ſpoonfuls of ſtrong vinegar, one ſpoonful of oil, and a ſmall quantity of Venice turpentine. Let the whole boil for ſome minutes over a moderate fire, ſtirring it all the time. Then take it off; and when there is occaſion to uſe it, warm it, and cover the ſticks well with it. This is the beſt ſort of bird-lime for ſnipes, and other birds that love wet places.

In order to uſe the common bird-lime, cut down the main branch or bough of any buſhy tree, whoſe twigs are thick, ſtraight, long, and ſmooth, and have neither knots nor prickles. The willow and the birch trees will beſt anſwer the purpoſe. Trim off all the ſuperfluous ſhoots; and when the twigs are made neat and clean, let them be well covered with the bird-lime, within four inches of the bottom, but without touching the main bough from which they proceed. Some art is neceſſary to lay on the bird-lime properly; ſo that it be neither too thick, which would give the birds a diſtaſte, and prevent their approaching it; nor too thin, ſo that it would not hold them when they touch it. Having prepared the buſh, let it be placed in ſome dead hedge, or among growing buſhes, near the outſkirts of a town, a farmer's yard, or ſuch ſituation, if it be in the ſpring, when the birds reſort to ſuch places. If it be uſed in ſummer, let the buſh be fixed in the midſt of a quick-ſet hedge, or in groves, buſhes, or white-thorn trees, near fields of corn, hemp, flax, and the like; and in the winter, near ſtacks of corn, hovels, barns, and ſuch places. When the lime-buſh is thus planted, the ſportſman muſt ſtand as near it as he can, without being diſcovered, and contrive to make ſuch ſorts of notes as the birds do when they call to one another. Bird-calls may be uſed for this purpoſe; but the moſt expert method is to imitate with the voice the notes of call of the ſeveral birds. When a ſingle bird is thus enticed to the buſh, and faſtened to it, the ſportſman is to wait till, by ſtruggling to releaſe itſelf, it becomes more ſecurely attached, and by its fluttering it has brought other birds to the buſh; ſo that in this way ſeveral may be caught at once. The time of the day for this ſport is from ſun-riſe to 10 o'clock, and from one till ſun-ſet. Another mode of bringing the birds together is by a ſtale; ſuch as, a bat faſtened in ſight at a diſtance, or an owl, which is followed by ſeveral ſmall birds, which, alighting on the lime-buſh, will be entangled. The ſkin of an owl ſtuffed, or even the image of an owl carved on wood and painted in its natural colours, has been ſucceſsfully uſed for the ſame purpoſe.

M. Barrera, phyſician at Perpignan, diſcovered an animal bird lime, prepared of the boils of a ſort of caterpillars, by putrifying them in the earth, ſteeping them in water, and then pounding and mixing them with olive oil. Fontenel. Hiſt. Acad. Scienc. 1720, p. 12.

Birds, *migration of.* See Migration.

Birds' *neſts*, in *Cookery*, the neſts of a ſmall Indian ſwallow, very delicately taſted, and frequently mixed among ſoups. Mr. Marſden, in his account of Sumatra, ſir George Staunton in his embaſſy to China, and many other travellers of more ancient and modern date, have recited ſeveral particulars concerning theſe edible neſts. But we have a more minute and ample deſcription of them, as well as of the birds by which they are formed, in the *third* volume of the "Tranſactions of the Batavian Society in the Iſland of Java, for promoting the arts and ſciences." The birds that conſtruct them are of a blackiſh grey colour, ſomewhat inclining to green, but gradually changing on the back to the tail, and on the belly into a mouſe colour. The length of the bird, from the bill to the tail, is about $4\frac{1}{2}$ inches; and its height, from the bill to the extremity of the middle toe, $3\frac{1}{4}$ inches. The diſtance from the tip of one wing to that of the other, when extended, is $10\frac{1}{4}$ inches; the largeſt feathers of the wings are about 4 inches in length. The head is flat; but, on account of the thickneſs of the feathers, appears round; and large in proportion to the ſize of the

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reſt of the body. The bill is broad, terminating in a ſharp extremity, and incurvated like an awl. Its width is increaſed by a naked piece of ſkin, reſembling parchment, which, when the bill is ſhut, is folded together; but when open, is conſiderably extended, and enables the bird, while on wing, to catch with greater eaſe the inſects that ſerve it for food. The eyes are black and large; the tongue is ſhaped like an arrow, and not forked; the ears are flat, round, naked ſpots, with ſmall oblong openings, and are wholly concealed under the feathers of the head; the neck is very ſhort, as well as the legs and bones of the wings; the thighs are wholly covered with feathers; and the very tender lower parts of the legs, and the feet, are covered with a ſkin like black parchment. Each foot has four toes; three before, and one turned backwards. The toes are ſeparate to their roots; and the middle one, together with the claw, is as long as the lower part of the leg. Each toe is furniſhed with a black, ſharp, crooked claw, conſiderably long, by which the bird can eaſily attach itſelf to crags of rocks. The tail is as long as the body, together with the neck and head: when extended it has the form of a wedge, and conſiſts of ten large feathers; the four firſt of which on each ſide are long, and, when the tail is cloſed, extend almoſt an inch beyond the reſt. The other feathers decreaſe towards the middle of the tail, and are equal to about the length of the body. The whole bird is very light and tender; ten of them together weighed little more than $2\frac{1}{2}$ ounces. The Javaneſe call it "lawit;" but thoſe who live in the mountains, "berongdagæ," or "waled:" veerong, in the Malay language, ſignifying in general a bird.

There are two places in particular, near Batavia, where theſe birds are found in great numbers. The firſt, Calappa Nongal, lies about 10 miles ſouth of the city; and the other, Sampia, is ſomewhat more diſtant to the ſouth-weſt: but both are in that range of high land extending towards the ſea, and apparently different from the large ridge that extends over the whole iſland. Beſides theſe there are alſo other places in the ſame diſtrict, or at a greater diſtance from the coaſt, which either produce a few, or are carefully concealed by the Javaneſe, to whom they are known. The two bird mountains above-mentioned, called by the Javaneſe (goa) caverns, are inſulated rocks, hollow within, and pierced with numerous openings of different ſizes; but ſome ſo ſmall, that they ſeem to be peculiarly adapted to the ſecurity of theſe little animals. On the outſide, theſe rocks are covered with various kinds of tall trees; and within, they conſiſt of grey calcareous ſtone and white marble. To the ſides of theſe caverns the birds affix their ſmall neſts in horizontal rows, and ſo cloſe as almoſt to adhere together. They are conſtructed at different heights, from 50 to 300 feet; and no cavity that is dry and clean is left unoccupied; but if the ſides of the caverns be in the leaſt wet or moiſt, the birds deſert them. At day-break theſe birds fly abroad from their holes, with a loud flattering noiſe; and in dry weather riſe inſtantaneouſly to ſuch a height in the atmoſphere, for the purpoſe of ſeeking their food in diſtant parts, that they are ſoon out of ſight. In the rainy ſeaſon they never wander far from their holes, particularly in Java, where ſome rocks are ſituated near the ſhore. About 4 in the afternoon they return, and confine themſelves ſo cloſely to their retired habitations, that none of them are ſeen to fly either out or in, except thoſe that are hatching. They feed upon all ſorts of inſects that hover over the ſtagnated water; and theſe, by the eaſy extenſion of their bills, they readily catch. Their moſt deſtructive enemy is a kind of hawk, which ſeizes many of them as they iſſue from their holes, and which the people frighten away by ſhooting at them. Their neſts are prepared, ſays this writer, from the ſtrongeſt remains of the food which they uſe, and not of the ſcum of the ſea, or of ſea-plants, as ſome have aſſerted. On this ſubject, however, there have been different opinions. Kæmpfer ſays, that the ſubſtance with which they form their neſts is the mulluſca or ſea-worm; according to Le Poivre, fiſh-ſpawn; according to Dalrymple, ſea-weeds; and according to Linnæus, the animal ſubſtance often found on the ſea-beach, and called by fiſhermen blubbers or jellies. In proof of his opinion, this author ſuggeſts, that it is known from experience, that thoſe birds, which build their neſts in the two rocks before-mentioned, have never been found on the ſea-coaſt, and could not poſſibly fly thither and return again in ſo few hours, on account of the high intervening mountains, and the ſtormy winds that often prevail among them. The great difference in the colour and value of theſe neſts proves, that their goodneſs depends merely on the ſuperabundance and quality of the inſects on which they feed, and perhaps on the greater or leſs ſolitude of the place where they ſeek nouriſhment. Thoſe found in the territory of Calappa Nongal and Goagadja are exceedingly grey, and worth one third leſs than thoſe produced in the territory of Sampia; and theſe latter are not to be compared with an excellent ſort which is every year imported from Ternate and Paſſier, or which is to be found on the ſurrounding iſlands, particularly to the eaſt of Borneo. Theſe birds occupy two months in preparing their neſts: they then lay their eggs (two in number), on which they ſit for 15 or 16 days. As ſoon as the young are fledged, people begin to collect the neſts, which is regularly done every four months; and this forms the harveſt of thoſe who are the proprietors of the rocks. The buſineſs of taking down the neſts is performed by perſons accuſtomed from their youth to climb theſe rocks. For this purpoſe they conſtruct ladders of reeds and bamboos, by which they aſcend to the holes; or, if the caverns are too deep, they employ ſhip-ropes. When they have deſcended to the bottom of the caverns, they place bamboos with notches in them againſt the ſides, if theſe be ſufficient, in order to get up to the neſts; but if they cannot thus reach them, they aſcend the ladders, and pull down the neſts with poles of bamboo made for that purpoſe. There are alſo certain holes to which people can aſcend by means of ſteps made of bamboos; but theſe are very few. This employment is very dangerous: many loſe their lives in purſuing it, and more particularly thoſe who attempt to rob theſe caverns at improper ſeaſons; for guarding againſt whoſe depredations, there are ſmall watch-houſes conſtructed in their vicinity. The mountaineers who engage in this occupation, never undertake their labour till they have ſlaughtered or ſacrificed a buffalo; which cuſtom is continually obſerved by the Javaneſe, at the commencement of any extraordinary enterprize. On ſuch occaſions they mutter over a few prayers, anoint themſelves with aromatic oil, and fumigate the holes with odoriferous ſubſtances. At the chief of theſe caverns, in the iſland of Java, a particular protecting female deity is worſhipped, under the name of "Raton Laut Ridul," or Princeſs of the South Sea. She is provided with a ſmall hut, and a covered ſleeping place, together with various elegant articles of dreſs, which no one but a princeſs muſt approach. On every Friday, when the neſts are taken down, incenſe is continually burnt; and the body and clothes of every one who intends to aſcend the rocks muſt be expoſed to it. In order to have light in the caverns, they uſe torches made of the reſinous gum of a large tree called "caret," and the inner bark of the arek tree.

The gathering of the neſts continues no longer than a month, and may be repeated three times a year. Some ſay it may be done a fourth time; but the moſt experienced ſay, that

that a neſt, as long as it remains entire, is continually enlarged or made thicker, until it is entirely deſerted by the bird, when it has become dry or hairy in the inſide. When the neſts have been collected, they require only to be dried and cleanſed, and then they are packed in baſkets and ſold to the Chineſe. Their price varies, and depends on their whiteneſs and fineneſs. Some of them have a grey, and others a reddiſh appearance: thoſe of the beſt ſort are exceedingly ſcarce. They are ſold at the rate of from 800 to 1400 rix-dollars per 125 pounds. This high price, and the inſatiable avarice of the Chineſe, give riſe to much diſhoneſty and thieving, eſpecially as the Chineſe make no ſcruple of bribing the watchmen with money, opium, and clothes; nor can any vigilance prevent this fraud. Calappa Nongal and Sampia formerly belonged to the Dutch Eaſt-India company; but, in 1778, the government reſolved to ſell them by auction to the higheſt bidder, and received for them almoſt 100,000 rix dollars. Beſides theſe, there are ſeveral other places of a like kind, though leſs important, in the ſame range of mountains; and there are alſo two or three in the high land, in the interior parts of the country, and ſeveral ſmall ones, which are carefully concealed. Three conſiderable bird-mountains, Goa Daher, Gede, and Nangaſari, are ſituated in the government of Samarang, in Java; and theſe are waſhed by the ſea, which forms its way ſo deep into the latter that fiſh may be caught in it. In theſe places the neſts are of an excellent quality; but the ſteepneſs of the rocks, and the violence of the ſurf, render it very dangerous to collect them; and, therefore, a ſuſpended apparatus of bamboos is employed for this purpoſe. The quantity of theſe neſts, collected annually in the iſland of Java, amounts to 2500 pounds in weight. There are alſo bird caverns in Bantam, and the iſland of Sumatra, in the Andaman and Nicobar iſlands, in the iſland of Borneo, and alſo in Cochin-China. The young birds are eaten both by the Javaneſe and the Europeans in India; but it is difficult to procure them. They are conſidered as very heating: but the neſts, on the other hand, when they have been boiled to a ſlimy kind of ſoup, expoſed in the night-time to the dew, and mixed with ſugar, are very cooling. The Javaneſe, therefore, uſe them in violent fevers; and they are ſaid to be preſcribed with good ſucceſs for ſore throats and hoarſeneſs. This latter uſe of them has probably been derived from the Chineſe, who carry on a great trade by theſe neſts, and eat many of them in the winter, becauſe ſore throats are then very common in the northern part of the kingdom, in conſequence of the people accuſtoming themſelves to ſit very much over the fire. But the author of the paper, from which theſe particulars are extracted, was not able to diſcover this nouriſhing and ſtrengthening quality that has been ſo much extolled, though he uſed a conſiderable number of theſe neſts, prepared in various ways, in order to convince himſelf of the fact. He cauſed them to be examined by able chemiſts; but nothing more could be obſerved than that the ſolution preſented a weak gum with a diſagreeable taſte, which perhaps might be of ſome uſe in ſlight indiſpoſitions of the breaſt.

Theſe neſts are, therefore, a mere article of luxury to adorn the tables of the rich. The Chineſe are remarkably fond of them. After being ſoaked and well cleanſed, they put them, along with a fat capon or a duck, into an earthen pot cloſely covered, and ſuffer them to boil for 24 hours over a ſlow fire, which they call "timmen;" and, on account of this addition, the whole diſh acquires a more luſcious taſte. The trade in theſe neſts has of late much increaſed. The high and advancing price of them in China makes Batavia the principal mart of this commodity, which is employed, ſince the company have ſurrendered it, very advantageouſly by the inhabitants, to leſſen the prejudicial exportation of ſpecie.

The ſpecies of ſwallow that forms theſe neſts is not to be found in China. Linnæus gives, as a diſtinguiſhing mark of the *hirundo eſculenta*, that it has white ſpots only on the feathers of the tail. But the ſmall birds in Java that conſtruct the neſts, have ſpots neither on the tail nor on any other place. The tail feathers are entirely of one colour, blackiſh grey above, and a little brighter below. Rumphius ſays of his *capodes marinæ*, that the feathers of the tail were ſpotted, and that the breaſt alſo was ſpeckled black and white. Valentin, in his deſcription of the ſmall ſwallow which conſtructs edible neſts, mentions neither ſpots nor ſpeckles; and only ſays, that the belly was undulated black and white. If theſe are to be conſidered as eſſential differences, it will follow that there are two kinds of theſe ſwallows: one with a ſpeckled breaſt, and white ſpots on the tail feathers; and the other, without ſpots or ſpeckles. A third kind of theſe ſwallows would be thoſe called "momos," or "boerongitams." Theſe alſo prepare their neſts of eatable ſubſtances; but on account of the number of ſmall feathers, and other impurities mixed with them, they are not fit to be uſed; and people, therefore, endeavour, as much as poſſible, to exterminate them, as they ſpoil the habitations of the better kinds. They are diſtinguiſhed from the others merely by being larger, and having their legs down to the feet covered with ſmall feathers.

Birds, *pictures of, prepared by means of their own feathers.* For this purpoſe, procure a thin board of deal or wainſcot, well ſeaſoned, that it may not warp. On this paſte white paper, and let it dry: then get any bird which you would wiſh to repreſent, and draw its outline on the paper, in the deſired attitude, and in its natural ſize, with the addition of any landſcape or back-ground, &c. which you may think beſt. This outline ſo drawn is afterwards to be filled up with the feathers from the bird, placing each feather in that part of the drawing correſponding to the part of the bird from which it was taken. To do this, cover the outline repreſentation with ſeveral coats of ſtrong gum-water, allowing it to dry between each coat, till it is of about the thickneſs of a ſhilling. When the ground is thus prepared, take the feathers off from the bird, beginning at the tail or points of the wings, and work upwards towards the head. Theſe feathers muſt be prepared by clipping off all the downy part; and the large feathers muſt have the inſides of their ſhafts pared off, ſo that they may lie flat. In laying them on, hold them by a pair of ſmall pliers, and, moiſtening the gummed ground with water, place each feather in its natural and proper ſituation. Keep each feather down, by placing upon it a ſmall leaden weight, till you have another ready to be laid on. Care muſt be taken not to let the gum paſs through the feathers, ſo as to ſmear them or to adhere to the bottom of the weight, and thus pull off or diſorder the poſition of the feathers. When all the feathers are put on, cut a piece of round paper, and colour it to reſemble the eye of the bird, and then ſtick it in its proper place; but the beſt ſubſtitutions for this purpoſe are ſmall eyes made of glaſs. The bill, legs, and feet, muſt be drawn and coloured from nature. When it is finiſhed and adjuſted to your mind, lay a ſheet of paper upon it, and upon that a heavy weight to preſs it down; and after it has remained in that poſition till it is quite dry, it may be preſerved in a glaſs-frame.

Birds, *preſervation of.* Many methods have been uſed by naturaliſts for preſerving dead birds from corruption, in their natural form and colour. Some have taken off the ſkin, with all the feathers upon it, from the body and thighs, leaving the tail, legs and wings, with the whole neck and the bill, and filled it with ſome ſoft ſtuff, ſuch as hay, wool,

wool, or flax. Mr. Kuckahn (ubi infra), and Dr. Lettsom (Naturalist's Companion, p. 12, &c.), who approve of this method as one of the most compleat and least troublesome, direct, that after opening the bird by a longitudinal incision from the breast to the vent, separating the fleshy parts from the bones, and removing the entrails, eyes, brain, and tongue, the cavities and the inside of the skin should be sprinkled with the powders (as below); the eyes to be inserted, for which purpose wax may be used, or glass-eyes of any size or colour may be cheaply procured; and the head to be stuffed with cotton or tow. When this is done, a wire should be made to pass down the throat, through one of the nostrils, and fixed into the breast-bone. Wires should also be introduced through the feet up the legs and thighs, and inserted into the same bone; and then the body should be filled with cotton to its natural size, and the skin sewed over it. The attitude should also be regarded; for in whatever position the subject is placed to dry, the same position will be afterwards retained. The powder which he recommends is composed of $\frac{1}{4}$ lb. of corrosive sublimate, $\frac{1}{2}$ lb. of prepared or burnt saltpetre, $\frac{1}{4}$ lb. of burnt alum, $\frac{1}{2}$ lb. of flowers of sulphur, $\frac{1}{4}$ lb. of camphor or musk, 1 lb. of black pepper, and 1 lb. of tobacco ground coarse. The whole should be mixed together, and kept in a glass vessel stopped close.

This method is particularly described by Mr. Kuckahn, Phil. Trans. vol. lx. p. 311, &c. When the above-mentioned process is finished in the manner which he has minutely detailed, he advises to bake the birds intended for preservation in an oven of a due degree of heat; and he observes, that baking is not only useful in such preservations, but will also be of very great service to old ones, as it destroys the eggs of insects. And it should be, he says, a constant practice once in two or three years to bake them over again, and to fresh wash the cases with a liquid made by dissolving one pound of camphor in half a gallon of spirit of turpentine.

Others have put them into vessels full of spirit of wine, or strong brandy; against which it has been objected that spirituous liquors change the colours of the feathers; but M. Reaumur concludes from many experiments, that this objection is groundless; and he has given several minute directions for preserving and conveying them in this way. Others again, especially in countries where spices are cheap, have embalmed dead birds. Reaumur observes, that powdered alum or lime will serve the same purpose. Another method which has been sometimes practised, is that of drying birds for preservation in a heated oven. It is of importance, however, that dried birds should be secured in boxes or barrels sufficiently closed, that insects may not slip in during the voyage or journey; and all the empty spaces left in the barrel should be filled up with hemp, flax, cotton, &c. The same ingenious naturalist informs us, that quadrupeds, fishes, reptiles, and insects, may be preserved in the same manner with birds. For Reaumur's directions to this purpose, see Phil. Trans. Abr. vol. xi. page 891, &c.

Mr. Chaptal recommends the following method of preparing all kinds of animals for cabinets as exceedingly simple, and so certain in its effect that he never found it to fail in a single instance. The matter contained in the bowels of the animal must be evacuated, either by gradually pressing the body towards the rectum, or by injecting some liquid which may remove every thing that stands in its way. After this operation, the end of the rectum should be tied with a thread, and ether should be injected with a proper instrument into the body, through the mouth or bill; and when the bowels have been filled with it, the animal is to be hung up by the head. One of the eyes must then be scooped out, and the brain extracted; after which the head is also filled with ether, which must be prevented from escaping by plugging up the eye hole. On the second or third day the injection of ether is to be repeated; and this process is to be continued till the animal is completely dried. While it is gradually drying, care must be taken to give the body its proper position; and as soon as it is completely desiccated, it may be put up without further care or any other preparation. Ether is preferable to spirits of wine, because, by its evaporation, it carries with it not only its own aqueous particles, but those also which it absorbs from the body. Besides, this method neither destroys the form of the animal, nor tarnishes the splendour of the feathers or hair, and is very cheap: one ounce of ether being in general sufficient for a small bird. The process of drying, says Mr. Chaptal, might perhaps be a little shortened by the application of artificial heat. The theory of this process, as this ingenious chemist thinks, is, that the ether, while it evaporates, volatilises the moisture in the animal body, and by these means effects a gradual desiccation, and thus removes the only cause of corruption.

The method of preserving birds in Guiana, described by Bancroft (p. 184.), is as follows: The birds intended for preservation, and for being conveyed to the cabinets of Europe, are deposited in a proper vessel, and covered with high wines, or the first running of the distillation of rum. In this spirit they remain for 24 or 48 hours, or longer, according to their size, till it has penetrated every part of their bodies. When this is done, the birds are taken out, and the feathers, which are not at all changed by this immersion, are placed smooth and regular. They are then put into a machine, made for the purpose; and the head, feet, wings, tail, &c. are placed exactly agreeable to life. In this position they are put into an oven, very moderately heated, where they are slowly dried; and they will ever after retain their natural position, without danger of putrefaction.

Birds, *singing*, are the nightingale, blackbird, starling, thrush, linnet, lark, throstle, canary bird, bullfinch, goldfinch, &c. See Song *of birds*.

BIRDAMA, in *Ancient Geography*, a town of India, on this side the Ganges, which, according to Ptolemy, was the capital of a people called Porvari.

BIREMIS, from *bis*, *double*, and *remus*, *oar*, in *Antiquity*, a vessel with one or more rows of oars, ranged, as some think, in two stages over each other; or a vessel, having two ranks or rows of oars placed over, and aside of each other. But the particular fabric of these vessels seems far from being a settled point among the learned. The Roman *biremis* is the same with what the Greeks call δικροτα, and stands contradistinguished from *triremis*, *quadriremis*, &c.

BIRINGOCCIO, or Biringucci, Vannuccio, in *Biography*, a mathematician of Sienna, was descended of a noble family, and flourished about the 16th century. After having been employed by the dukes of Parma and Ferrara, he entered into the service of the Venetians. He is said to have been the first Italian author who wrote on the art of fusing and casting metals; particularly for the purpose of making cannon. His work, entitled, "Pirotechnia, &c." was printed at Venice in 1540, 4to; at Bologna, in 1678, 8vo; and at the same place in 1550, 1558, and 1559, 4to. A Latin translation of it appeared at Paris in 1572, 4to; and at Cologne, 1658, 4to. A French translation by Jacob Vincent, was published at Paris in 1556, and 1559, 4to; and at Rouen in 1627. As a metallurgic writer, who detailed his own observations and experiments, and gave a clear and connected account of the chief processes in metallurgy, Biringoccio is highly commended by professor Beckman. Gen. Biog.

BIRKAN, in *Geography*, a town of Arabia, 24 miles ſouth of Saade.

BIRKENFELD, a town of Germany, in the circle of the Upper Rhine, and county of Sponheim, the ſeat of a bailiwic, including 32 villages and two iron founderies. It was taken by the French in 1794; and in their new arrangement, it is the principal place of a diſtrict of the ſame name, in the department of Sarre. The town contains 1061, and the canton 5892 perſons. This diſtrict comprehends 38 communes, and its whole territorial extent includes 1615 kiliometres. It is ſituated 30 miles E. N. E. of Treves, and 30 N.N.W. of Deux Ponts.

BIRKENHEAD, or Berkenhead, Sir John, in *Biography*, a political writer of ſome celebrity, was meanly deſcended, and born at Northwich, in the county of Cheſter, about the year 1615. In 1632 he was entered as a ſervitor in Oriel college, Oxford, and afterwards became amanuenſis to archbiſhop Laud, who recommended him in 1640 to be choſen probationer fellow of All-Souls' College. When Oxford became the head-quarters of king Charles I. in the time of the civil war, Birkenhead was ſelected as a proper perſon to write a kind of journal in ſupport of the royal cauſe; which office he diſcharged to the ſatisfaction of his employers, and with reputation and advantage to himſelf. The king appointed him reader in moral philoſophy; and this poſt, more honourable than lucrative, he retained till the year 1648, when he was expelled by the parliament viſitors. From hence he removed to London, where he wrote ſeveral poetical pieces, chiefly of a ſatirical kind, levelled againſt the republicans in power; and on account of his ſteady attachment to the royal cauſe, he was called the "loyal poet," and ſuffered ſeveral impriſonments. Upon the reſtoration of Charles II. he was rewarded for his loyalty. In 1661, he was created doctor of the civil law, by the univerſity of Oxford; and about the ſame time, was returned to ſerve in parliament for the borough of Wilton. He was knighted in 1662, and ſucceeded ſir Richard Fanſhaw as maſter of requeſts. The favours which he received from the court expoſed him to many ſevere attacks from thoſe who oppoſed it; but he was eſteemed by the learned perſons of his time, and elected a fellow of the Royal Society; and his memory has been tranſmitted with honour to poſterity by Dryden, Langbaine, and Winſtanley, notwithſtanding the reproaches of Anthony Wood. He died in Weſtminſter, in 1679. Biog. Brit.

BIRKESTORFF, in *Geography*, a town of Germany, in the circle of Weſtphalia and duchy of Juliers, one mile north of Dueren.

BIRKET EL HADJIS, or *Lake of Pilgrims*, a lake of Egypt, communicating with the Nile, and ſituate 10 miles E.N.E. of Cairo, near which the companies which form the caravan to Mecca aſſemble.

BIRKET EL KERUN, or Caroun, a lake of Egypt, 30 miles long and 6 broad in the middle, but of an irregular form, and narrowing towards each end; 40 miles S. W. of Cairo. See Moeris.

BIRKHEHER, Blauer Raker, in *Ornithology*, the name of the garrulous roller, *coracias garrula* in Friſch. Av.

BIRKIN, in *Geography*, a river of England, which runs into the Bollin, one mile ſouth of Altringham in the county of Cheſter.

BIRKOZOWKA, a town of Poland, in the palatinate of Kiov, 40 miles S.E. of Bialacerkiew.

BIRLAB, a town of Egypt, in the route from Catieh to El Ariſh, 17 miles E.N.E. of Catieh, and at a ſmall diſtance eaſt of the lake of Sebaket Bardoil, or king Baldwin's lake.

BIRLAT, a town of European Turkey, ſeated on a river of the ſame name, in the province of Moldavia, 60 miles N. W. of Galate, and 116 S.W. of Bender.—Alſo, a river which runs into the Siret at Dubravitza, in Moldavia.

BIRMAN, or Burman *Empire*, comprizes the kingdoms of Ava and Pegu, and derives its name from the Birmahs or Burmahs, who have been long known as a warlike nation, in the country formerly called "India beyond the Ganges;" its capital being Ava or Aungwa. The boundaries of this empire are not eaſily aſcertained. Burmah, conſidered as diſtinct from Pegu, and ſometimes erroneouſly denominated Ava from its capital, borders on Pegu to the north, and occupies both banks of the river Ava, as far as the frontiers of China. On the north-weſt is Meckley, and on the Weſt Aracan and Roſhaan. On the eaſt it has the kingdom or country of Upper Siam, which begins at a ſmall diſtance eaſtward from the city of Ava; a ridge of mountains ſeparating it from Burmah and Pegu. But the king of Burmah is now ſaid to poſſeſs not only the country of Meckley, in addition to thoſe of Pegu and Burmah, but alſo the whole tract which lies on the north of it, between China, Thibet, and Aſam. According to colonel Symes, to whom we are much indebted for our knowledge of the Birman empire, it appears to include the ſpace between the 9th and 26th degrees of north latitude, and between the 92d and 107th degrees of eaſt longitude, about 1050 geographical miles in length, and 600 in breadth. Such are the aſcertainable limits from the Birman accounts; but it is probable that their dominions ſtretch ſtill farther to the north. The breadth, however, often varies, and is in many places very inconſiderable, on what is called the eaſtern peninſula. To the north this empire is ſeparated by mountains from Aſam, and further to the eaſt it borders on Thibet and China. On the weſt it is divided from the Britiſh dominions in Bengal by a range of mountains, and the little river Naaf; and the limit is continued by the ſea. But the ſouthern and eaſtern boundaries are ſomewhat obſcure. If it be extended to the ninth degree of latitude, it muſt include a conſiderable portion of the Malayan peninſula, or the province of Tenaſſerem, and city of Mergui, formerly regarded as part of Siam; and if, on the eaſt, it be extended to the 107th degree of longitude, it might be ſaid to comprehend almoſt the whole of the country called India beyond the Ganges, as far as the mouths of the Japaneſe river in Cambodia. But it does not appear that Siam is regarded as a portion of the Birman empire, and even in this caſe it would only extend to 103 degrees. In this ſtate of uncertainty, however, we muſt ſatisfy ourſelves with obſerving, that this empire conſtitutes the fifth grand native power in India, ſince Hindooſtan and Perſia have been divided, and may probably extend its authority over Laos and Cambodia, while it remains ſeparated by deſerts and ranges of lofty mountains from the united kingdoms of Cochinchina and Tonquin.

Of the ancient ſtate of the countries which now conſtitute this empire, our knowledge is very imperfect. (See Chersonesus.) With regard to their modern hiſtory, Col. Symes obſerves, that we are indebted for our firſt information principally to the Portugueſe, who made themſelves maſters of Malacca early in the 16th century. Accordingly the Portugueſe hiſtorians inform us, that in the middle of this century four powerful ſtates divided among them the regions that lie between the ſouth-eaſt province of Britiſh India, Yunan in China, and the eaſtern ſea; and that their territories, beſides ſome intervening lands belonging to petty independent princes, extended from Caſſay and Aſam on the N.W. as far to the S. E. as the iſland of Junkſeylon. Theſe

nations were known to Europeans by the names of Aracan, Ava, Pegu, and Siam; which see respectively. The empire of Ava, as it was called, is situated eastward of Aracan, and separated from it by a ridge of lofty mountains. (See ARACAN.) On the N.W. it is divided from the kingdom of Cassay by the river Keen-duem; on the north it is bounded by mountains, and petty independent principalities, that lie contiguous to Asam; on the north-east and east it touches on China and North Siam; and on the south its limits have been so variable, that it is not easy to define them. The city of Preme, or Pee, seems to be the original aud natural boundary of the Birman empire, though by conquests it has been extended much farther to the south. Pegu is the country southward of Ava, which occupies the sea-coast as far as Martaban. (See PEGU.) The kingdom of Siam extended to the south as far as Junkseylon, east to Cambodia and Laos, and north to Ozemee, probably the Chiamee of Loubere, and Yunan in China. (See SIAM.) These boundaries, however, may be considered more as the claim than the actual possession of each state; whilst alternate victory and defeat have occasionally extended and contracted their dominions. From the Portuguese we learn, that the Birmans, though formerly subject to the king of Pegu, became afterwards masters of Ava, and caused a revolution in Pegu about the middle of the 16th century; extending their kingdom from Maravi, probably Mergui, near Tenasserem, to the province of Yunan in China, about 800 miles from north to south, and 250 from east to west. The influence of the Portuguese, which was for some time very considerable in the Birman and Pegu countries, was supplanted by the Dutch; and it appears that, in the beginning of the 17th century, both the English and Dutch had obtained settlements in various parts of the Birman dominions, which were forfeited by the misconduct of the latter; so that Europeans of all nations were banished from Ava. The English, however, several years after this expulsion, were reinstated in their factories at Syriam and Ava, where they traded more as private merchants than on the part of the India company, in whose service they were not regularly enrolled. The supremacy of the Birmans over the Peguers continued till about the year 1740, when the latter, inhabiting the provinces of Dalla, Martaban, Tongo, and Prome, revolted, and a civil war ensued. In 1744, the British factory at Syriam was destroyed by the contending parties. At length the Peguers, by the assistance of some Europeans, who traded to their ports, gained several victories over the Birmans, particularly in the years 1750 and 1751; and in 1752 the capital of Ava was invested, and the Birmans, after a short siege, compelled to surrender at discretion. The last of a long line of Birman kings was taken prisoner; but two of his sons were fortunate enough to make their escape to the Siamese, where they were kindly received, and assured of security and succour. Upon this conquest the principal inhabitants of the country about Ava acknowledged themselves vassals to the victorious king of Pegu, and accepted the prescribed oath. After some time, Alompra, a Birman of low extraction, who had been continued by the conqueror in the possession of a small village called Monchaboo, determined to emancipate himself from the yoke of oppression. Accordingly, having assembled 100 followers, on whose fidelity and courage he could rely, he attacked a band of 50 Pegu soldiers, who had been stationed in Monchaboo, and put every one of them to the sword; and after several previous encounters with the Pegu force dispatched against him, he gained possession of Ava in 1753. The contest was obstinate and bloody; but Alompra, pursuing his conquests, founded the town of Rangoon, or Dagon, signifying "victory achieved;" and soon after chastised the people of Cassay, who had revolted from the Birman authority. In 1756 he blockaded the town of Syriam, which yielded to his arms; and having deprived the capital of any foreign aid by water, he advanced against the city of Pegu, invested it in January 1757, and in about three months took possession of it. He then proceeded to subdue the countries to the east of the city, as far as the Three Pagodas, which were the ancient boundary between Pegu and Siam. Tavoy, which was once an independent principality, and recognized as such by the English in 1753, has been since added to the Birman possessions in this quarter. Alompra, triumphing in his success, determined to chastise the Siamese, who had afforded an asylum to his rebellious subjects; and for this purpose he ordered a fleet to sail to Mergui, a sea-port belonging to the Siamese, which soon surrendered; and the capture of Mergui was followed by the conquest of Tenasserem. The next object of Alompra was the reduction of the capital of Siam; but whilst he was prosecuting the siege, he was seized with a disorder which proved fatal, and saved the Siamese from destruction. Alompra, apprised of his approaching end, gave orders for a retreat; when he had arrived within two days' march of Martaban, on the 15th of May 1760, he expired, very much to the regret and sorrow of his subjects, who regarded him as their deliverer, and as a wise, powerful, and victorious sovereign. By the prudence of his councils he secured what his valour had acquired; he was not more eager for conquest than attentive to the improvement of his territories, and the prosperity of his people; he issued a severe edict against gambling, and prohibited the use of spirituous liquors throughout his dominions; he reformed the courts of justice; he abridged the power of magistrates, and forbade them to decide at their private houses on criminal causes, or on property where the amount exceeded a specified sum; every process of importance was decided in public, and every decree registered. His reign was short but vigorous; and if his life had been prolonged, it is probable that his country would at this day have been farther advanced in national refinement and the liberal arts. He did not live to complete his 50th year; his person, strong and well proportioned, exceeded the middle size; and though his features were coarse, his complexion dark, and his countenance saturnine, there was a dignity in his deportment that became his high station. Alompra, the founder of the Birman empire, was succeeded by his son Namdogee Praw, who, after suppressing several insurrections, died in 1764, and left an infant son, Momien; whose uncle Shembuan, second son of Alompra, assumed first the regency, and afterwards the diadem. Shembuan, having usurped the royal power, diverted the national attention from his conduct, by declaring war against Siam; and two armies entered the country from the north and south, which, being united, defeated the Siamese about seven or eight days' journey from their capital. The consequence of this defeat was the immediate investiture of Siam by the Birmans; and after a siege of two months, the capitulation of the city. The king having withdrawn during the progress of the siege, a Siamese governor was appointed, who took an oath of allegiance to the Birman monarchy, and engaged to pay an annual tribute. The Chinese, having planned the subjugation of the Birman empire, and concerted measures for adding the dominion of the Jerawaddy and the fertile plains of Ava to their empire, advanced in the beginning of the year 1767, from the western frontiers of Yunan, with an army of 50,000 men, to accomplish their object; but they were met by the Birmans, and after a conflict which lasted three days, totally routed with very dreadful carnage. The lives of the captives were spared for the benefit of the country; various employments were assigned them; and they were encouraged to marry Birman wives, and to consider them-

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ſelves as natives of the country. The Siameſe, however, though vanquiſhed, remained unſubdued; and the inherent enmity that ſubſiſts between theſe two nations will probably prevent either ſervitude or alliance on the part of the one to the other, unleſs they are broken by ſuch repeated defeats as muſt nearly amount to extirpation. As ſoon as it was known that the Birmans had withdrawn into their own territories, a Siameſe prince aſſumed the monarchy, and in 1771 defeated the Birmans. The king, who had puſillanimouſly abandoned his throne and people, is ſaid to have periſhed in the woods, probably by the dagger of the uſurper. Shembuan, the Birman ſovereign, who had rebuilt ancient Ava, the metropolis of the empire, which had fallen to ruin during the late commotions, purſued his favourite ſcheme of extending his conqueſts towards the weſt, and having advanced within two days' march of Coſpore, the capital of Cachar, forced the raja of the province to ſubmit to his power, by the moſt unequivocal proofs of vaſſalage, according to the cuſtom of the country. Shembuan died at Ava in 1776, and was ſucceeded by his ſon Chenguza, whoſe tyrannical conduct occaſioned a conſpiracy, at the head of which was Shembuan Minderagee Praw, the younger brother of the deceaſed Shembuan, and the preſent monarch. Chenguza was ſlain in 1781, and fell unlamented, as he had lived deſpiſed. Among other acts of ſavage cruelty, with which he is charged, one is his conduct towards his ſecond wife, the daughter of one of the Attawoons, or privy-counſellors, of his court, a young woman endowed with virtue, beauty, and various accompliſhments. Under the impulſe of ſudden rage, he accuſed her of infidelity, and without allowing time for cool judgment, pronounced ſentence of immediate death. Accordingly the trembling and innocent victim was dragged from the palace, and incloſed in a ſack of ſcarlet cloth, richly ornamented; thus confined, ſhe was put on board a boat, when the ſack being ſuſpended between the narrow necks of two earthen jars, the whole was ſunk in the deepeſt part of the river Jerawaddy. Her afflicted father, overwhelmed with anguiſh and deprived of all his offices, retired in deſpair to the city of Chagaing; and waited the opportunity that ſoon after occurred, of being avenged. When Chenguza was forcing his way towards the royal palace, the Attawoon ſnatched a ſabre from an attendant officer, and at one ſtroke cut him through the bowels, and laid him breathleſs at his feet; nor did any perſon offer to prevent or avenge the cruel tyrant's death. Shembuan Minderagee withdrew the ſeat of government from Ava, and founded a new city called Ummerapoora; which ſee. The Birman conqueſts having already been extended as far as Mergui to the ſouth, and ſeveral of the northern provinces which formerly belonged to Siam, having been reduced to ſubjection, and tribute, Shembuan Minderagee, obſerving the ſupineneſs of the rajah of Arracan, and the unwarlike diſpoſition of his ſubjects, and allured by the fertility of its ſoil, and its aptitude for commerce, determined to invade the country, and to annex it as an appendage to the Birman crown. Accordingly, in 1783, this conqueſt was effected. (See ARRACAN.) The Birman arms were next directed towards Siam. Although the Birmans could not retain poſſeſſion of its inland parts, they maintained their dominion over the ſea-coaſt; ſo that all the ports on the weſtern ſhore of the peninſula, as far as Mergui, in N. lat. 12° 20′, continued ſubject to them. But they ſtill wiſhed to obtain the iſland of Junkſeylon, which would give them the entire dominion of the weſtern coaſt, as far as the territories of the Malay prince of Queedah, and not only enable them to monopolize the commerce of the peninſula, but prevent the Siameſe from a communication with India by any other channel than that of the gulf of Siam. A fleet was fitted out in 1785 for ſubduing this iſland; but the enterpriſe failed. The Birman monarch, mortified by the diſappointment of his views, reſolved as ſpeedily as poſſible to repair the diſgrace; and for this purpoſe he marched in the ſpring of 1786, from his capital at the head of 30,000 men, with a train of 20 field-pieces, which army was ſupported by a fleet of 16 ſhips, that blocked up the harbour of Junkſeylon. The ſovereign, ſanguine in his expectations, had ſcarcely entered the Siameſe territories, before he was oppoſed by the king of Siam, and, after a furious engagement, completely routed. In the commencement of the enſuing year, the Siameſe invaded the viceroyalty of Martaban, which comprehends within its juriſdiction Tavoy, Mergui, and all the Birman poſſeſſions towards the ſouth; but having laid unſucceſsful ſiege to Tavoy, they were obliged to retreat and abandon the enterpriſe. In 1793 overtures for peace were made on the part of the Siameſe; and they were followed by a negociation, which ſpeedily terminated in the ratification of a treaty highly favourable to the Birman intereſts. By this compact, the Siameſe ceded to the Birmans the weſtern maritime towns as far as Mergui; thus yielding to them entire poſſeſſion of the coaſt of Tenaſſerem, and the two important ports of Mergui and Tavoy; which were acquiſitions of great moment, conſidered either in a political or commercial light. From this ſtatement it appears, that the Birman empire can ſcarcely be computed to extend beyond the 102d degree of longitude, and that only in the part to the north of Siam. The Birmans are indiſputably pre-eminent among the nations which inhabit the vaſt peninſula that ſeparates the gulf of Bengal from the Chineſe ſea; they poſſeſs a territory equal in extent to the German empire; and they are bleſſed with a ſalubrious climate, and a ſoil capable of producing almoſt every article of luxury, convenience, and commerce, which the eaſt can ſupply. After their treaty with the Siameſe, they enjoyed the pleaſing proſpect of a long exemption from the miſeries of war; but their pride and reſentment embroiled them in freſh troubles before they had time to profit by the advantages of peace, and threatened to excite againſt them a foe more formidable than the Chineſe, Arracaners, Peguers, Siameſe, and Caſſayers. The Birman monarch, conceiving that the piratical banditti who infeſt the Broken iſlands, and commit various depredations to the injury of trade, were protected by the Britiſh flag, and that they ſought refuge in the Britiſh diſtricts, ordered a body of 5000 men to enter the territories of the company, in order to ſeize the delinquent fugitives, and he ſtationed an army of 20,000 men at Arracan for the purpoſe of ſupporting this detachment. As the Birmans had made no previous application for redreſs in a pacific way, a ſtrong detachment was formed at the preſidency, and entruſted to the conduct of major-general Erſkine, for reſiſting this aggreſſion. On the approach of the Britiſh general, the Birman chief propoſed terms of accommodation, ſtipulating for the ſurrender of the fugitives as the baſis of the agreement. The general declined all treaty whilſt the Birmans continued on Engliſh ground; but after a repreſentation of the caſe made in perſon by the Birman chief, he gave hopes, that if the Birmans peaceably retired, the governor-general would inſtitute a regular inquiry into the grievance which was the ſubject of complaint. The Birman chief, profeſſing his reliance on the declaration of general Erſkine, agreed to withdraw his troops, and conducted his retreat in the moſt orderly manner. The matter was afterwards inveſtigated, and the guilt of the delinquents being ſatisfactorily proved, they were delivered over to their own laws, by whoſe ſentence two out of the three that had been accuſed underwent capital puniſhment. The amicable termination of this difference afforded favourable opportunity for acquiring a more accurate knowledge than had hitherto been obtained, of a people, whoſe ſituation, extent of territory,

tory, and commercial connexions with British India, rendered a liberal intercourse with them highly desirable. The trade between Calcutta, Madras, and Rangoon, the principal Birman port, had of late years so rapidly increased, as to become an object of national importance: more particularly on account of the teak timber, the produce of Ava and Pegu, whence Calcutta and Madras draw all their supplies of wood for ship building and for various other purposes. A commerce in one article so essential, and on a general scale so extensive, as to require an annual return of Indian commodities to the amount of 200,000l. was an object well worth cultivating. With this view sir John Shore (now lord Teignmouth) thought proper, in 1795, to send a formal deputation to the Birman court. The particulars of this embassy are described by Col. Symes, with whom the conduct of it was entrusted. "The Birmans," says this writer, "under their present monarch, are certainly rising fast in the scale of oriental nations; and it is to be hoped, that a long respite from foreign wars will give them leisure to improve their natural advantages. Knowledge increases with commerce; and as they are not shackled by any prejudices of casts, restricted to hereditary occupations, or forbidden from participating with strangers in every social bond, their advancement will, in all probability, be rapid. At present, so far from being in a state of intellectual darkness, although they have not explored the depths of science, nor reached to excellence in the finer arts, they yet have an undeniable claim to the character of a civilised and well instructed people. Their laws are wise, and pregnant with sound morality; their police is better regulated than in most European countries; their natural disposition is friendly and hospitable to strangers; and their manners rather expressive of manly candour, than courteous dissimulation: the gradations of rank, and the respect due to station, are maintained with a scrupulosity which never relaxes. A knowledge of letters is so widely diffused, that there are no mechanics, few of the peasantry, or even the common watermen (usually the most illiterate class), who cannot read and write in the vulgar tongue. Few, however, are versed in the more erudite volumes of science, which, containing many Shanscrit terms, and often written in the Pali text, are (like the Hindoo Shasters) above the comprehension of the multitude; but the feudal system, which cherishes ignorance, and renders man the property of man, still operates as a check to civilization and improvement. This is a bar which gradually weakens, as their acquaintance with the customs and manners of other nations extends: and unless the rage of civil discord be again excited, or some foreign power impose an alien yoke, the Birmans bid fair to be a prosperous, wealthy, and enlightened people."

The present capital of the Birman empire is Ummerapoora, and one of its chief ports is Rangoon; which see respectively. Its other principal towns will occur in the course of this work. See Arracan, Ava, Chagaing, Martaban, Merghi, Monchaboo, Munnipoora, Pagahm, Pegu, Persaim, Prome, Syriam, Tenasserem, Tavoy, &c. The chief rivers of this country are Irrawaddy, or the river of Ava (see Ava), whose numerous mouths and streams very amply provide the means of inland navigation, Keenduem, Maygue, Pitang, and Thaluan. Its lakes are numerous; among which one of the principal is Tounzamahn. The highest range of mountains is probably that which lies on the frontiers of Thibet. The other ranges pass north and south, except a small range running east and west, which supplies the sources of the river of Pegu; but their names are not known, except that of Anoupee, between Ava and Arracan. The forests are large and numerous: and supply almost every description of timber that is known in Hindoostan; and about four days' journey to the north of the capital firs grow in abundance; but the principal tree of these forests is the teak, which flourishes in many parts of the empire, to the north as well as to the south of the capital. The forests, as well as the mountains, of the interior, and, in general, of the whole northern frontier, remain unexplored: and the tigers that infest them, prevent their being particularly examined.

The present sovereign of the Birman empire assumes the title of "Boa," or emperor; and though the form of government be despotic, yet he is accustomed to consult a council of ancient nobles. There is no country of the East in which the royal establishment is arranged with more minute attention than in the Birman court; it is splendid without being wasteful, and numerous without confusion. The queen and princes have the title of "Praw," which is both a sovereign and a sacerdotal appellation; and is frequently used by an inferior when addressing his superior. In the application of this term, it has been suggested, that there is an obvious analogy between the Birmans and the ancient Egyptians. "Phra," it is said, was the proper name under which the Egyptians first adored the sun, before it received the allegorical appellation of Osiris, and they conferred this title on their kings and on their priests. It has been further conjectured, that the title of "Pharaoh," given to successive kings of Egypt, is a corruption of the word "Phraw," or "Praw," in its original sense signifying the sun, and applied to the sovereign and priesthood, as the representatives on earth of that splendid luminary. However this be, "Praw" is a princely title in the Birman empire. The elder son of the king is denominated "Engy Teekien," or "Engy Praw," or prince royal; and as the crown descends to the male heirs in a direct line, the son takes precedence of his uncles. Next in rank to the princes of the blood royal are the "Woongees," i. e. bearers of the great burthen, who are the chief ministers of state. Their established number is four, and they constitute the great council of the nation. They sit in the "Lotoo," or imperial hall of consultation, every day, except the Birman sabbath; they issue mandates to the "Maywoons," or viceroys of the different provinces; they controul every department of the state, and govern the empire in subordination to the king, whose will is absolute, and whose power is undefined. With these are associated, for the purposes of deliberation, and of the execution of public business, four other officers, called "Woondocks," whose authority is very inferior and limited. The views and wishes of the Woongees are frequently counteracted by the interference of the four "Attawoons," or ministers of the interior, who are selected by the king to be his privy-counsellors, from an opinion of their talents and integrity, and who have access to him at all times, which is a privilege which even the principal Woongee does not enjoy. There are several other subordinate officers, by whom the affairs of government, in its various departments, are transacted. There are also Woons of the queen's household, and of that of the prince-royal; and each of the junior princes has a distinct establishment. The Birman government has no hereditary dignities or employments; for on the demise of the possessor, all honours and offices revert to the crown. The order of nobility has different degrees, distinguished by the number of strings, or small chains, that compose the "tsaloe," or chain, which is the badge of the order. No subject is ever honoured with a higher degree than 12; and the king alone wears 24. Rank among the Birmans is indicated by every article of use and of ornament; the shape of the beetle-box, which is carried by an attendant after a person of distinction wherever he goes, his ear-rings, cap of ceremony, horse-furniture, and even the metal of which his spit

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ting-pot and drinking cup are made, specify and distinguish the several gradations of society; and a person who assumes the insignia of a degree, which is not his legitimate right, is subject to certain penalties. The court dress of the Birman nobility consists of a long robe, of flowered satin or velvet reaching to the ancles, with an open collar and loose sleeves; over this hangs from the shoulders a scarf, or flowing mantle; and on the head is worn a high cap of velvet, either plain, or of silk embroidered with flowers of gold, according to the rank of the wearer. Ear-rings are also a part of male dress; persons of condition use tubes of gold about three inches long, and of the thickness of a large quill, expanding at the end like the mouth of a speaking trumpet; others wear a heavy mass of gold, beaten into a plate, and rolled up, which forms a large orifice in the lobe of the ear, and by its weight drags it down to the extent sometimes of two inches. The rank of the females is also distinguished by their dress. The hair, which is tied in a bunch at the top of the head, and bound round with a fillet, has its peculiar and discriminating embroidery and ornaments. Over a short shift, which reaches to the pit of the stomach, and is drawn tight by strings, so as to support the breasts, is a loose jacket with close sleeves; and round the waist is rolled a long piece of silk or cloth, reaching to the feet, and sometimes trailing to the ground. When women of condition go abroad, they put on a silk sash, resembling a long shawl, which crosses their bosom, and is thrown over the shoulders, gracefully flowing on each side. Women in full dress, stain the palms of their hands and their nails of a red colour, for which they use a vegetable juice, and strew on their bosoms powder of sandal wood, or of a bark called sunneka, with which some rub their faces. Both men and women tinge the edges of their eyelids and their teeth with black. Men of rank wear, in common dress, a tight coat with long sleeves, made of muslin or of very fine nankeen, which is manufactured in the country; also a silk wrapper that encircles the waist; but the working class are naked to the middle, except that in the cold season they use a mantle or vest of European broad cloth, which is highly prized.

With regard to *religion*, the Birmans are Hindoos, not as votaries of Brahma, but sectaries of Boodh; which see. The latter contend with the former for the honour of antiquity, and are undoubtedly far more numerous. The Cingleze in Ceylon are Boodhists of the purer class; and the Birmans acknowledge that they originally received their religion from that island, which they call "Zehoo." It was brought, say the Rhahaans, first from Zehoo to Arracan about 600 years ago, and thence was introduced into Ava, and probably into China; for the Birmans confidently assert, that the Chinese are Boodhists. However this be, it is allowed, that the bonzes of China, like the Rhahaans of Ava, wear yellow as the sacerdotal colour, and that in many of their customs and ceremonies we may trace a very striking similitude. Whatever may be the antiquity of the worship of Boodh, the wide extent of its reception is unquestionable. The Birmans believe in the metempsychosis, and that, after having undergone a certain number of transmigrations, their souls will at last be received into their paradise on the mountain of Meru, which is the celestial north pole of the Hindoos, round which they place the garden of Indra, and which they describe as the seat of delights. The Birmans regard mercy as the chief attribute of the deity; and they worship God by extending mercy to all his creatures. Of the religious buildings appropriate to the Birman worship, the temple of Shoedagon, or Dagoung, near Rangoon, that of Shoemadoo at Pegu, and that of Syriam, are the most considerable. (See RANGOON, PEGU, and SYRIAM.) Their priests are denominated Rhahaans; and they have numerous kioums or convents which differ in their structure from common houses, and much resemble the architecture of the Chinese. They are made entirely of wood; the roof is composed of different stages, supported by strong pillars; the inside comprehends one large hall; the whole house is open at the sides; some of them are curiously carved with various symbolic representations of the divinity. They have no apartments for the private recreation of the Rhahaans; publicity being the prevailing system of the conduct of the Birmans, who admit of no secrets either in church or state. The convents in the neighbourhood of Rangoon are very numerous; and hence it appears that the number of Rhahaans, and of Phonghis, priests of an inferior order, vulgarly called Tallapoins, must be very considerable, amounting to 1500. Like the Carmelites, they go barefooted, and have their heads shaven, on which they never wear any covering. The only colour of the garments worn by the priesthood is yellow: the greatest part of their bodies is covered with a long loose cloke, that is wrapped round them; they profess celibacy, and abstinence from every sensual gratification. The prescribed punishment for a Rhahaan detected in an act of incontinence, is expulsion and public disgrace. The delinquent is seated on an ass, and his face is daubed with black paint interspersed with spots of white; and he is thus led through the streets, with a drum beating before him, and afterwards turned out of the city. But such instances of degradation rarely occur. The juniors are restricted from wandering about licentiously, either by day or night; nor can any go abroad without permission from the prior of the convent. The Rhahaans never perform any of the common functions of life, which would tend to divert them from the abstract contemplation of the divine essence. They perambulate the town at the dawn of the morn in order to collect supplies for the day: and these usually consist of boiled rice mixed with oil, dried and pickled fish, sweetmeats, fruit, &c. In their walks they never raise their eyes from the ground, nor do they even stop to solicit donations, and seldom even look at their benefactors, who are more desirous to bestow than they are to receive. The Rhahaans eat only once a day, at the hour of noon; and their superfluous provisions they distribute among the indigent strangers, or the poor scholars, who daily attend them to be instructed in letters, and taught their religious and moral duties. The Rhahaans are never known to take any public and active part in politics or in war; and as the Birmans and Peguers profess the same religion, the conquerors, whoever they were, equally respected the ministers of their faith. The head of the Rhahaans at Rangoon, or the "Seredaw," lives in a handsome monastery about half a mile from the town: and values himself very much on the sacerdotal titles, conferred on him by the present and late king, and which he ostentatiously displays engraven on iron plates. There were formerly nunneries of virgin priestesses, who, like the Rhahaans, wore yellow garments, cut off their hair, and devoted themselves to chastity and religion; but these societies have been long since abolished, as being injurious to the population of the state.

The *laws* of the Birmans are inseparable from their religion: and, like the latter, of Hindoo extraction. They profess to have derived them from Menu, the grandson of ramah, the first of created kings, who received the sacred Principles on which they are founded by divine revelation, and who promulgated the code. Numerous commentaries on Menu were composed by the Munis, or old philosophers, whose treatises constitute the "Dherma Sastra," or body of law. The code of Gentoo laws, translated by Mr. Halhed is said to be a compilation from the different commentaries on Menu. These laws, as well as the religion of the Birmans, found their way into the Ava country from Arracan, and

and came originally from Ceylon, about 600 years ago. The Birman ſyſtem of juriſprudence is replete with ſound morality; and is diſtinguiſhed above any other Hindoo commentary for perſpicuity and good ſenſe. It provides ſpecifically for almoſt every kind of crime that can be committed, and adds an ample chapter of precedents and deciſions to guide the inexperienced in caſes of doubt and difficulty. The trial by ordeal, however, is diſgraceful to this code; but it prevails in all countries where the Hindoo religion is profeſſed, and is as ancient as their records. An inſtance of the exerciſe of this mode of trial is mentioned by colonel Symes. Two women having litigated a ſmall property in a court of juſtice; and the judges finding it difficult to decide the queſtion of right, it was agreed to refer the matter to the iſſue of an ordeal. The parties, attended by the officers of the court, the Rhahaans, and a multitude of people, repaired to a tank, or pond. After certain prayers and ceremonials of a purifying nature, the two litigants entered the pond and waded in it, till the water reached as high as their breaſts; they were accompanied by two or three men, one of whom placed them cloſe to each other, and put a board on their heads, which he preſſed down till they were both immerſed at the ſame inſtant. After continuing out of ſight for about one minute and a half, one of them being nearly ſuffocated, raiſed her head, whilſt the other continued to ſit upon her hams at the bottom, but was immediately lifted up by the man; after which an officer of the court pronounced judgment in her favour, and of the equity of the deciſion none of the bye-ſtanders ſeemed to entertain the ſmalleſt doubt. This practice, however, and that of imprecation, are now loſing ground, and have of late years been diſcountenanced by the judicial courts both of India and Ava. Laws dictated by religion are in general conſcientiouſly adminiſtered. The criminal juriſprudence of the Birmans is lenient in particular caſes, but rigorous in others. Whoever is found guilty of an undue aſſumption of power, or of any crime that indicates a treaſonable intent, is puniſhed by the ſevereſt tortures. The firſt commiſſion of theft does not incur the penalty of death, unleſs the amount ſtolen be above 800 kiat, or tackal, *i. e.* about 100 l., or attended with circumſtances of atrocity, ſuch as murder, or mutilation. In the former caſe, the culprit has a round mark imprinted on each cheek by gunpowder and punctuation, and on his breaſt the word thief, with the article ſtolen; for the ſecond offence he is deprived of an arm; but the third inevitably produces capital puniſhment. Decapitation is the mode by which criminals ſuffer, and in the performance of it the Birman executioners are exceedingly ſkilful. The official hall of juſtice, where the members of provincial governments, and all municipal officers, are accuſtomed to aſſemble for the tranſaction of public buſineſs, in various parts of the Birman empire, is denominated Rhoom. Every man of high rank in the empire is a magiſtrate, and has a place of this deſcription and name contiguous to his dwelling; but it is always on the outſide of the incloſure of his court-yard, and not ſurrounded by any fence or railing, in order to manifeſt publicity, and ſhew that it is the ſeat of majeſty and juſtice, to which all mankind may have free acceſs.

The *population* of the Birman dominions is not eaſily aſcertained with accuracy; but Col. Symes was informed, by a perſon on whoſe teſtimony he could rely, that the number of cities, towns, and villages in the empire amounts to 8000, without including the recent addition of Arracan. Suppoſing, therefore, each town, on an average, to contain 300 houſes, and each houſe 6 perſons, the reſult will give a population of 14,400,000. Few of the inhabitants, he ſays, live in ſolitary habitations, but moſtly form themſelves into ſmall ſocieties; ſo that their dwellings thus collected compoſe their Ruas, or villages; and therefore he concludes that if their number, including Arracan, be reckoned at 17 millions, it will not exceed the truth.

With regard to the *military* and *naval* force of the Birmans, we may obſerve, that though every man in the kingdom is liable to military ſervice, and war is deemed the moſt honourable occupation, the regular military eſtabliſhment is very inconſiderable. When an army is to be raiſed, a mandate iſſues from the golden palace to all viceroys of provinces, and miougees of diſtricts, requiring a certain number of men at an appointed day; and the levy is proportioned to the population of the province or diſtrict, eſtimated by the number of its regiſtered houſes. Every two, three, or four, houſes are required to furniſh one recruit, or to pay 300 tackal, or about 40 l. or 45 l. in money. This recruit is ſupplied by government with arms and ammunition, but has no pay. The families of theſe conſcripts are retained in the diſtrict which they inhabit as hoſtages for the good conduct of the ſoldier; and in caſe of deſertion, or treachery, his wife, children, or parents are dragged forth to execution; nay, cowardice ſubjects the family of the delinquent to capital puniſhment. The infantry and cavalry compoſe the regular guards of the king; the former are armed with muſkets and ſabres, and the latter with a ſpear about ſeven or eight feet long, which they manage on horſeback with great dexterity. The royal magazines are ſaid to contain 20,000 firelocks, which are of a very indifferent kind. The moſt reſpectable part of the Birman military force is their eſtabliſhment of war-boats. The king can command, at a very ſhort notice, 500 of theſe veſſels, which are formed out of the ſolid trunk of the teak tree, excavated partly by fire, and partly by cutting; the largeſt of them are from 80 to 100 feet long, and 8 feet broad, and they carry from 50 to 60 rowers. The prow is ſolid, and has a flat ſurface, on which is mounted a piece of ordnance. Each rower is provided with a ſword and a lance; and beſides the boatmen, there are uſually 30 ſoldiers, who are armed with muſkets. The attack of theſe gun-boats is very impetuous; and thoſe who conduct them advance to action with a war-ſong, by which they regulate the ſtrokes of their oars, encourage one another, and daunt their adverſaries; and when they grapple, the action becomes very ſevere, as theſe people poſſeſs ſingular courage, ſtrength, and activity. As the veſſels lie low in the water, their principal danger is that of being run down by a larger boat ſtriking on their broadſide. The largeſt of theſe war-boats, which are managed with ſurpriſing dexterity, both in advancing and retreating, as well as in the time of action, do not draw more than three feet of water. The proper weapons of the country are the ſpear, the javelin, which is thrown from the hand, the croſs-bow, and the ſabre; the latter of which is uſed by the Birmans, not only as an implement of war, but for various purpoſes of manual labour.

The *revenue* of the Birman empire ariſes from one-fourth of all produce, and of all foreign goods imported into the country. However, as grants to princes of the blood, great officers of ſtate, and provincial governors, are made in provinces, cities, villages, and farms, the rent of which they collect for their own benefit, and money is ſeldom diſburſed from the royal coffers, the Birman ſovereign poſſeſſes immenſe treaſures.

The *climate* of every part of the Birman empire appears to be diſtinguiſhed by its ſalubrity; and the natives are healthy and vigorous. In this reſpect they poſſeſs a decided preeminence over the enervated natives of the Eaſt; nor are the inhabitants of any country capable of greater bodily exertion

tions than the Birmans. The feafons are regular, and the extremes of heat and cold are feldom experienced; at leaft, the duration of that intenfe heat, which immediately precedes the commencement of the rainy feafon, is fo fhort, that the inconvenience of it is very little felt. The forefts, however, like fome other woody and uncultivated parts of India, are extremely peftiferous; and an inhabitant of the champaign country confiders a journey thither as inevitable deftruction. The wood-cutters, who are a particular clafs of men, born and bred in the hills, are faid to be unhealthy, and feldom attain longevity.

The *foil* of the fouthern provinces of the Birman empire is remarkable fertile, and produces as luxuriant crops of rice as are to be found in the fineft parts of Bengal. Towards the north the face of the country is irregular and mountainous; but the plains and vallies, particularly near the river, are exceedingly fruitful; they yield good wheat and the various kinds of fmall grain which grow in Hindooftan, together with moft of the efculent legumes and vegetables of India. Sugar-canes, tobacco of a fuperior quality, indigo, cotton, and the different tropical fruits, in perfection, are all indigenous products of this country. Befides the teak-tree, which grows in many parts of the Birman empire, as well to the north of Ummerapoora, as in the fouthern country, there is almoft every defcription of timber that is known in India. The kingdom of Ava abounds in minerals; fix days journey from Bamoo, which is a province near the frontiers of China, there are mines of gold and filver, called "Badouem;" there are alfo mines of gold, filver, rubies, and fapphires, at prefent open on a mountain near the Keenduem, called "Woobolootaun;" but the moft valuable, and thofe which produce the fineft jewels, are in the vicinity of the capital nearly oppofite to Keoum-meoum. Precious ftones are found in feveral other parts of the empire. The inferior minerals, fuch as contain iron, tin, lead, antimony, arfenic, fulphur, &c. occur in great abundance: amber, of a confiftence unufually pure and pellucid, is dug up in large quantities near the river: gold likewife is difcovered in the fandy beds of ftreams which defcend from the mountains. Between the Keenduem and the Irrawaddy, to the northward, there is a fmall river called "Shoe Lien Kioup," or the ftream of golden fand. Although the Ava empire produces no diamonds and emeralds, it affords amethyfts, garnets, very beautiful chryfolites, jafper, loadftone, and marble: the quarries of the latter lie a few miles from Ummerapoora; and it is equal in quality to the fineft marble of Italy, and admits of a polifh that renders it almoft tranfparent. The fale of marble is prohibited; but great quantities are confumed in the manufacture of the images of Gaudma, which are fabricated in the city and diftrict of Chagain; however, the exportation of thefe marble divinities out of the kingdom is ftrictly forbidden.

The *commerce* of the Birman empire is very confiderable. An extenfive trade is carried on between the capital and Yunan in China. The principal article of export from Ava is cotton, of which, it is faid, there are two kinds, one of a brown colour, of which nankeens are made, the other white, like the cotton of India. This commodity is tranfported up the Irrawaddy in large boats as far as Bamoo, where it is bartered at the common "jee," or mart, with Chinefe merchants, and conveyed by the latter, partly by land, and partly by water, into the Chinefe dominions. Amber, ivory, precious ftones, beetle nut, and the edible nefts brought from the eaftern archipelago, are alfo articles of commerce; in return for which the Birmans procure raw and wrought filks, velvets, gold leaf, preferves, paper, and fome utenfils of hardware. The commerce between the capital and the fouthern parts of the empire is facilitated by the noble river that waters the country. Several thoufand boats are annually employed in tranfporting rice from the lower provinces to Ummerapoora and the northern diftricts. Salt, and gnapee, a kind of fifh-fauce ufed with rice, are alfo articles of internal commerce. Articles of foreign importation are moftly conveyed up the Irrawaddy; and fome few are introduced by way of Arracan. See ARRACAN. Among the articles of foreign trade, which have found their way into the Birman country, nothing is held in higher eftimation than the European glafs-ware imported into Rangoon from the Britifh fettlements in India. The Birmans are fo fenfible of the advantages of commerce, and fo defirous of improving it, and of thus increafing population, which they confider as much more effential to the ftrength of a ftate than the extent of its territory, that they have, of late years, tolerated all fects, Pagans and Jews, Muffulmen and Chriftians, the difciples of Confucius, and the worfhippers of fire, and invited ftrangers of every nation to refort to their ports; and being themfelves free from thofe prejudices of caft, which fhackle their Indian neighbours, they have permitted foreigners to intermarry and fettle among them. The children of ftrangers, whatever be the fect to which they belong, born of a Birman woman, equally become fubjects of the ftate, and are entitled to the fame protection and privileges, as if they had fprung from a line of Birman anceftry. To Britifh India commercial intercourfe with that part of the Birman empire called Pegu is of great importance. This intereft involves three diftinct objects; that of fecuring from this quarter regular fupplies of timber for fhip-building; that of introducing into the country as many of our manufactures as its confumption may require, and of endeavouring to explore a mart in the fouth-weft dominions of China, by means of the great river Ava; and that of guarding with vigilance againft every incroachment, or advance, which may be made by foreign nations to divert the trade into other channels, and to obtain a permanent fettlement in a country fo contiguous to the capital of our poffeffions. The teak timber for the conftruction of our fhips in that part of the world is an article peculiarly intereting in a political and commercial point of view. Some of the fineft merchant fhips at Calcutta have been lately built of this timber. Madras is alfo fupplied from Rangoon with timber for all the common purpofes of domeftic ufe; and even Bombay, although the coaft of Bombay is its principal ftorehouf, finds it worth while annually to import a large quantity of planks from Pegu. It is alfo of importance, not only to promote the exportation of timber from the maritime towns of Pegu, but to difcourage the building of fhips in the Rangoon river, in which the Birmans are making rapid progrefs. National fecurity and commercial advantage demand peculiar attention to both thefe circumftances. The imports into Rangoon from the Britifh fettlements, in the year 1794-5, amounted, it is faid, to more than 12 lacks of rupees, or about 135,000l.; and thefe confifted chiefly of coarfe piece goods, glafs, hardware, and broad cloth; and the returns were made almoft wholly in timber. The maritime parts of this great empire are commodious for fhipping, and better fituated for Indian commerce than thofe of any other power. Great Britain poffeffes the weftern fide of the bay of Bengal; the government of Ava, the eaftern. From the mouth of the Ganges to cape Comorin, the whole range of our continental territory, there is not a fingle harbour capable of affording fhelter to a veffel of 500 tons burthen; but Ava comprehends, within her extent of coaft, three excellent ports; Negrais, the moft fecure harbour in the bay: Rangoon, and Mergui, each of which is equally convenient and much

much more accessible than the river of Bengal, which is the only port in our possession within the bay. The entrance into this is an intricate and dangerous channel; but, from the harbour of Negrais a ship launches at once into the open bay, and may work to the southward without any impediment besides that which is occasioned by the monsoon. The Birman empire possesses such a variety of advantages resulting from situation, extent, produce, and climate, that it may be reckoned, among eastern nations, second in importance to China alone; whilst, from its contiguity to British India, it is to us of much greater consequence. To preserve a good correspondence and a good understanding with the court of Ava is therefore essential to our prosperity. It is our interest to maintain the independence of the Birmans, and to guard it from foreign encroachment; and then the Birman government will be united to ours in bonds of reciprocal amity and confidence. The result of the embassy of Col. Symes, sent by our governor-general of India to the kingdom of Ava in 1795, has been the establishment of this kind of amity and friendship. To the memorial presented on this occasion, the Birman monarch replied: "I, the king immortal, whose philanthropy is universal, whose anxiety for the benefit and welfare of all mankind never ceases, direct, that all merchant ships of the English nation, who resort to Birman ports, shall pay customs, charges, warehouse hire, searchers, &c. agreeably to former established usage. English merchants are to be permitted to go to whatever part of the Birman dominions they think proper, either to buy or to sell, and they are on no account to be stopped, molested, or oppressed; and they shall have liberty to go to whatever part of the Birman dominions they choose, for the purpose of buying, selling, or bartering, &c. by themselves or their agents; and it is further commanded, that they shall be at liberty to fix a resident at Rangoon, &c. and that English ships driven into Birman ports by stress of weather shall be supplied with all necessaries, &c. at the current rates of the country; and that the enemies of England, European as well as Indian, shall not be allowed to purchase warlike weapons, lead, and powder, which restriction is extended to all nations."

The *manufactures* of the Birmans consist of cotton and silk, saltpetre and gunpowder, various kinds of pottery, and marble statues; they also excel in gilding, to which purpose the greatest part of their gold is applied, and several other ornamental manufactures. Their edifices and barges are constructed with singular oriental taste and elegance; the most remarkable edifice is the Shomadoo at Pegu. Their kioums and temples, which are numerous, exhibit a very rich and fantastic kind of architecture; and their grand hall of audience, or Lotoo, at Ummerapoora, is as splendid an edifice as can be well executed in wood. Many of their houses are very simple in their structure, and are erected in a day, or even in a few hours. The requisite materials are bamboos, grass for thatching, and the ground rattan. The whole edifice is constructed without a single nail; a row of strong bamboos, from eight to ten feet high, are fixed firm in the ground, which form the outline, and are the supporters of the building; smaller bamboos are then tied horizontally, by strips of the ground rattan, to these upright posts; the walls, composed of bamboo mats, are faltened to the sides with similar ligatures; bamboo rafters are quickly raised, and a roof formed, over which thatch is spread in regular layers, and bound to the wood by filaments of rattan; a floor of bamboo is next laid in the inside, elevated two or three feet above the ground; this grating is supported on bamboos, and covered with mats and carpets. A house of this kind, simple and expeditious in its structure, is nevertheless a security against very inclement weather; and if it should chance to be blown down by a tempest, the inhabitants might escape without injury. They have other buildings, however, of a superior kind; and they were formerly constructed of various figures, pyramidal, triangular, or four-sided, surrounded with walls, and adorned with flowers and figures carved in wood, and built with arches. But the art of constructing arches has been lost among the Birmans. From many buildings that now remain, it appears, that they could formerly construct excellent brick arches, both circular and gothic; but now no one in the empire can be found sufficiently skilful to arch over the opening of a window. Masonry has fallen into neglect; the jealousy of the late princes having prohibited to private individuals the use of brick or stone houses. The Birmans have of late years made rapid progress in the art of building boats and ships; and these may be constructed in the Rangoon river for one third less than in the Ganges, and for nearly one half what they would cost at Bombay. It is said, however, that the ships of Pegu are not so firmly constructed as those in our ports. The Birmans, like the Chinese, have no coin; silver in bullion, and lead, are the current money of the country. What foreigners call a tackal, properly kiat, is the most general piece of silver in circulation; it weighs ten pennyweights ten grains and three fourths; its subdivisions are the tubbee, two of which make one moo; two moo one math; four math one tackal; and 100 tackal amount to one viss. Rice is sold by a measure called Tayndaung, or basket, weighing 16 viss, or about 56 pounds; and of measurement there are several subdivisions. The average price of rice at the capital is one tackal, rather more than half a crown, for a basket and a half. At Rangoon and Martaban, one tackal will purchase four or five baskets. The Birman measures of length are a paul-gaut, or inch, 18 of which compose the taim, or cubit. The saundaung, or royal cubit (varying according to the will of the monarch), is equal to 22 inches; the dha, or bamboo, consists of seven royal cubits; 1000 dha make one Birman league, or dain, nearly equal to two British miles and two furlongs; the league is also subdivided into tenths. The Birmans divide their time as follows. The interval in which the finger can be raised or depressed, is called charazi; 10 charazi make one piaan; 6 piaan one bizana, or about a minute. The day of 24 hours, commencing at noon, is divided into 8 portions, or yettee, of 3 hours each. These divisions of time are ascertained by a machine resembling the hour-glass, and sometimes by a perforated pan placed in a tub of water. They are announced by a stroke on an oblong drum, which is always kept near the dwelling of the chief magistrate of the city, town, or village; it is commonly raised on a high bamboo stage, under a roof of mats to protect it from the weather. The Birmans, whatever way they acquired it, have the knowledge of a solar year, consisting of 365 days, and commencing on the 18th day of April. But the common Birman year is lunar, and of course 11 days shorter than the solar year; it is divided into 12 months; but the Birman lunations consist alternately of 29 and 30 days, occasioning a difference between the Newtonian and Birman lunar account of 8 hours and 48 minutes. In order to complete a solar revolution, they intercalate in every third year a month of 30 days; in this third year the first and third months have each 30 days instead of 29; they likewise suppress or pass over a day, and by these the number of days in three solar years amounts to 1095. But every fourth year will occasion the difference of a day on account of our leap-year. This, and some other defects in their mode of computation, are sources of confusion; in order to remedy which, their style, or mode of calculation,

has frequently been altered by arbitrary authority. The manner in which the Birman month is ſubdivided is peculiar to their nation. Inſtead of reckoning the days progreſſively from the commencement to the cloſe of the month, they advance no farther than the full moon, from which they recede by retrograde enumeration until the month is finiſhed. The Birman month is divided into 4 weeks of 7 days each. The 8th day of the increaſing moon, the 15th or full moon, the 8th of the decreaſing moon, and the laſt day of the full moon, are religiouſly obſerved by the Birmans as ſacred feſtivals. On theſe hebdominal holidays no public buſineſs is tranſacted in the Rhoom; mercantile dealings are ſuſpended; handicraft is forbidden; and the ſtrictly pious take no ſuſtenance between the riſing and the ſetting of the ſun. The Birman era is ſaid to commence in our year 638, and it is that which is uſed by the philoſophers at Siam; and from them, as a more poliſhed nation, it has paſſed to the Birmans.

The Birmans are very fond of poetry and muſic; the former they call yeddoo; when repeated by a ſcholar, it flows ſoft and meaſured to the ear; ſometimes in ſucceſſive, and often in alternate rhymes. They have epic as well as religious poems of high celebrity, and they are fond of writing in heroic numbers the exploits of their kings and generals.

Muſic is a ſcience which is held in conſiderable eſtimation throughout the Birman empire; and the royal library of Ummerapoora is ſaid to contain many valuable treatiſes on the art. Some of the profeſſional muſicians diſplay conſiderable ſkill and execution, and the ſofter airs are pleaſing even to an ear unaccuſtomed to ſuch melody. The principal inſtruments are a ſoum, or harp, made of light wood, hollowed and varniſhed, reſembling a canoe with a deck; at the extremity a piece of hard wood is neatly faſtened, which tapers to the end, and riſes in a kind of curvature over the body of the harp; from this curvature, the ſtrings, uſually made of wire, are extended to a bridge on the belly of the inſtrument; it has two ſounding holes, one on each ſide of the bridge. The ſize of the ſoum varies from two to five feet in length. The turr reſembles our violin; it has only three ſtrings, and is played on with a bow. It is ſaid to be an original inſtrument of the country. The pullaway is a common flageolet. The kyzzoup is a collection of cymbals, ſuſpended in a bamboo frame. The patola, or guitar, is a curious inſtrument, of the form of a crocodile in miniature; the body is hollow, with ſounding holes on the back; three ſtrings of wire extend from the ſhoulder to the tail, and are ſupported on bridges at each extremity; the ſtrings are tuned by means of pegs in the tail, to which they are faſtened; it is played on by the finger, and is generally uſed to accompany the voice. The boundaw is a collection of drums, of oblong form and different ſize, which are ſuſpended perpendicularly in a wooden frame by leathern thongs. The whole machine is about five feet in diameter, and four feet high. The performer ſtands in the centre, and beats on the drums with a ſmall ſtick. This inſtrument is always introduced in a full band, and much uſed in proceſſions. The heem is the pipe of Pan, formed of ſeveral reeds neatly joined and ſounded by a common mouth-piece, and producing, when ſkilfully played on, a very plaintive melody. The Birmans are fond of ſinging and dancing; and the three laſt days of the ſolar year are commonly devoted to mirth and feſtivity. At Pegu they have a theatre, which is an open court, ſplendidly illuminated by lamps and torches, and in which dramatic performances are exhibited. Indeed, at all feſtivals they have dramatic entertainments, conſiſting of muſic, dancing, and action, with a dialogue in recitative. The ſubject is generally taken from the legends of their heroes, eſpecially of Rama. The beſt actors are ſaid to be natives of Siam; and in one of theſe we are told that the dialogue was ſpirited without cant, and the action animated without being extravagant; the dreſſes of the principal performers were alſo ſhewy and becoming. By way of interlude between the acts, a clowniſh buffoon entertained the audience with a recital of different paſſages, and by grimace and frequent alterations of tone and countenance, extorted loud peals of laughter from the ſpectators. The Birmans delight in mimicking, and are very expert in the practice, poſſeſſing uncommon verſatility of countenance. By pantomimic looks and geſtures, they exhibit a maſterly diſplay of the paſſions, making ſudden tranſitions from pain to pleaſure, from joy to deſpair, from rage to mildneſs, from laughter to tears, and of varying the expreſſion of terror and of idiotiſm, with ſurpriſing effect. On the laſt day of the Birman year, the 17th of April, there is a kind of ſport that is univerſally practiſed throughout the Birman dominions, to waſh away the impurities of the paſt year, and to commence the new year free from ſtain. Women on this day are accuſtomed to throw water on every man they meet, which the men have the privilege of returning. This paſtime is conducted with great decorum; and a woman who declines taking a part in it, is conſidered as avowing her pregnancy, and paſſes without moleſtation. At the cloſe of Lent, or during the whole ſeventh month, called Sadeen-guit, there are illuminations; every houſe has erected by it a kind of maſt, from which are ſuſpended one or more lamps. In the royal palace, a pyramid of lamps, at leaſt 150 feet high, is ſupported by a bamboo ſcaffolding. At this time the nobles from all parts of the empire reſort to court to pay their homage to the king. During the principal days and nights of theſe feſtivals, there is almoſt a conſtant ſucceſſion of wreſtling, dancing, muſic, proceſſions, fire-works, and theatrical entertainments.

The Birman alphabet conſiſts of 33 characters, having as many diſtinct ſounds, excluſive of various marks and contractions, that ſupply the place of long and ſhort vowels, diphthongs, &c. like the other alphabets of the Hindoo claſs. It has no repreſentation of the vowel correſponding with our ſhort *a*; this is nevertheleſs to be pronounced after every ſimple ſound or conſonant not ſupplied with another vowel, unleſs it be forbidden by a mark of eliſion placed over the letter, or excluded by the junction of two or more conſonants. The Birmans write from left to right; and though they have no diſtinguiſhing interval between their words, they mark the pauſes of a ſentence and the full ſtops. Their letters are diſtinct, and their MSS. are in general very beautiful. It has been the opinion of ſome of the moſt enlightened writers on the languages of the Eaſt, that the "Pali," or ſacred language of the prieſts of Boodh, is nearly allied to the Shanſcrit of the Bramins. The character in common uſe throughout Ava and Pegu is a round Nagari, derived from the ſquare Pali, or religious text; it is formed of circles and ſegments of circles, variouſly diſpoſed and combined, whilſt the Pali, which is ſolely applied to purpoſes of religion, is a ſquare letter, chiefly conſiſting of right angles. Their common books, like thoſe of the Hindoos in the ſouthern parts of India, are compoſed of the palmyra leaf, on which the letters are engraved with a ſtylus. In their more elegant books, the Birmans write on ſheets of ivory, or on very fine white palmyra leaves. The ivory is ſtained black, and the margins are ornamented with gilding, while the characters are enamelled or gilded. On the palmyra leaves the characters are in general of black enamel; and the ends of the leaves, and the margins, are painted

painted with flowers in various bright colours. A hole through both ends of each leaf, ſerves to connect the whole into a volume, by means of two ſtrings, which alſo paſs through the two wooden boards that ſerve for binding. In the finer binding of books of this kind, the boards are lacquered, the edges of the leaves cut ſmooth and gilded, and the title written on the upper board; the two ends are by a knot or jewel ſecured at a little diſtance from the boards, ſo as to prevent the book from falling to pieces, but ſufficiently diſtant to admit of the upper leaves being turned back, while the lower ones are read. The more elegant books are in general wrapped up in ſilk cloth, and bound round by a garter, on which the Birmans have the art to weave the title of the book. In every Kioum or monaſtery, there is a library or repoſitory of books, uſually kept in lacquered cheſts. In the royal library the number of theſe cheſts was not leſs than 100. The books were regularly claſſed, and the contents of each cheſt were written in gold letters on the lid. Some of theſe books exhibited very beautiful writing on thin leaves of ivory, the margins of which were ornamented with flowers of gold, neatly executed. The library contained books upon various ſubjects; more on divinity than any other; but hiſtory, muſic, medicine, painting, and romance, had their ſeparate treatiſes. Col. Symes thinks it not improbable, from the cheſts which he inſpected, that his Birman majeſty may poſſeſs a more numerous library than any potentate from the banks of the Danube to the borders of China. Books in the Pali text are ſometimes compoſed of thin ſtripes of bamboo, delicately plaited, and varniſhed over in ſuch a manner as to form a ſmooth and hard ſurface upon a leaf of any dimenſions: this ſurface is afterwards gilded, and the ſacred letters are traced upon it in black and ſhining japan. The margin is illumined by wreaths and figures of gold, on a red, green, or black ground. As moſt of the Birmans are taught to read and write, they carry with them a ſheet of thick and ſtrong blackened paper, called a parawaik, or paruvek, in which they enter their accounts, copy ſongs, till they can repeat them from memory, and take memorandums of any things that are curious. On theſe parawaiks the zares, or writers, in all courts and public offices, take down the proceedings and orders of the ſuperior officers. It is about 8 feet long, and 18 inches wide, and folds up like a fan; each fold being about ſix inches, and in length the whole breadth of the ſheet. They write on this with a pencil of ſteatites; and the characters are effaced by rubbing them over with charcoal, and the leaves of a ſpecies of dolichos.

In the recitation of poetry, the language is exceedingly melodious; even the proſe of common converſation appears to be meaſured, and the concluding word of each ſentence is lengthened by a muſical cadence, that marks the period to the ear of a perſon wholly unacquainted with the meaning.

Of the *coſmography* and *aſtronomy* of the Birmans, deduced from their moſt ancient writings, the following particulars will be ſufficient. They conceive that the univerſe, called logha, which ſignifies ſucceſſive deſtruction and reproduction, after it had been deſtroyed by fire, water, or wind, is again, of itſelf, reſtored to its ancient form. The earth, they ſuppoſe to be a plane, ſomewhat elevated in the centre, and ſurrounded by a chain of very lofty mountains. Its diameter is 1.203,400 juzana, each juzana being 44,800 cubits, or nearly 12 miles; its circumference is three times its diameter; and its thickneſs 240,000 juzana, of which one half is duſt, and the other half a ſolid rock, and the whole ſupported by a double thickneſs of water, reſting on twice its thickneſs of air, below which is a vacuum. Beſides our earth, there are 10,100,000 others, mutually touching in three points, and forming a ſimilar number of equilateral ſpaces, which, not being penetrated by the ſun's rays, are filled with water intenſely cold. In the middle of the moſt elevated part of our earth, the Birmah writings place Mienmo, the largeſt of all mountains, elevated above the ſurface of the ſea 84,000 juzana, and deſcending as far below it, ſupported by three feet of carbuncles, having its eaſtern face ſilver, the weſtern glaſs, the northern gold, and the ſouthern pale-coloured carbuncle, and ſurrounded by ſeven chains of hills. In the middle of the ocean, oppoſite to the four cardinal points of this mountain, are placed four large iſlands, the habitations of men and other animals; and beſides theſe, the Birman writers allow 2000 of a ſmaller ſize, 500 belonging to each of the larger ones. The ocean is in various parts of very different depths. All living beings are diſtributed into three claſſes; generating beings; thoſe which are material, but do not generate; and immaterial beings, or ſpirits, each of which is ſubdivided into ſeveral diſtinct ſpecies. The Birman writings admit of tranſmigration, alleging, that in death, whether of man, beaſt, or any living being, the ſoul periſhes with the body, and after this diſſolution, out of the ſame materials another being ariſes, which, according to the good or bad actions of the former, becomes either a man, or an animal, &c. and they teach, that all beings are revolving in theſe changes, till they become entitled by their actions to Nieban, the moſt perfect of all ſtates, in which they are free from change, miſery, death, ſickneſs, or old age. The Birman writings alſo announce the opinion of an infinite number of worlds in conſtant ſucceſſion, without beginning and without end. Theſe writings mention eight planets, *viz.* the Sun, Moon, Mercury, Venus, Mars, Jupiter, Saturn, and another named Rahu, which is inviſible. The Sun is 50 juzana in diameter, the Moon 49, Mars 12, Mercury 15, Jupiter 17, Venus 19, and Saturn 13; and their circumferences are triple their reſpective diameters. They ſuppoſe that the ſun, moon, and ſtars revolve round the great mountain Mienmo in a circle, the plane of which is parallel to the earth. The ſtars, according to them, purſue a conſtant courſe, without declining to the north or ſouth; but the ſun, moon, and other planets have a declination; and the ſun, in proceeding from the north to the ſouth, and from the ſouth to the north, always touches the twelve conſtellations, which we call the twelve ſigns of the zodiac, and in the ſpace of one year returns to the ſame place in the heavens from which he ſet out. This ſame revolution is performed by the moon in a month. The ſun's motion, they ſay, is quicker than that of the moon; and by his diurnal revolution, when he is in the ſouthern iſland it is mid-day, in the northern it is mid-night, in the eaſtern iſland the ſun ſets, in the weſtern it riſes. Although the ſun, moon, and ſtars appear to us round, we are not to ſuppoſe them to be ſpheres, but this is a fallacy of viſion. The inviſible planet Rahu ſerves the purpoſe of explaining eclipſes; for, being a huge monſter, he takes the ſun and moon either into his mouth or under his chin, and thus cauſes either total or partial eclipſes. As to the heat and cold which are experienced at different ſeaſons of the year, the Birmans ſay, that, from the vernal equinox to autumn, the ſun is always tending to the north, and the moon inclining to the ſouth; the ſeaſon is then hot, becauſe the ſun's rays, which are naturally hot, then prevail; but from the autumnal equinox to the vernal, the ſun inclines to the ſouth, and the moon to the north, and the moon's rays, which are by nature cold, predominate, and produce cold. They aſſign ſeven cauſes of rain, of which ſome are phyſical, and ſome moral. Theſe aſtronomical and phyſical ideas of the Birman writings were probably brought from Hindooſtan, together with their religion and laws; but for

for a more particular account of them we ſhall refer to the Aſiatic Reſearches (ubi infra).

Among the Birmans there are ſeveral hiſtories, containing an account of the lives and actions performed by the different families of their princes; which hiſtories are very fabulous, and abound with the recital of omens and prodigies. Indeed, the Birmans are much attached to divination. No perſon will commence the building of a houſe, a journey, or the moſt trivial undertaking, without conſulting ſome perſon of ſkill, in order to find a fortunate day or hour. Friday is a moſt unlucky day, on which no buſineſs ought to be commenced. On medicine the Birmans have ſeveral books, containing a deſcription of 96 genera of diſeaſes, with various recipes for their cure. Mummy is with them a favourite medicine, and they are not unacquainted with the uſe of mercury in the cure of lues venerea; but their mode of adminiſtering it is neither certain nor ſafe. Moſt of their remedies, however, are taken fom the vegetable kingdom; and they are chiefly of the aromatic kind, nutmegs being one of their moſt favourite medicines. Although they are well acquainted with the plants of their country, the practice of their phyſicians is almoſt altogether empirical, and they poſſeſs certain recipes and noſtrums, the efficacy of which they extol, and which have been tranſmitted from their anceſtors for ſeveral generations. They combine with their medical practice great faith in amulets and charms. In ſurgery, they proceed no further than dreſſing wounds and ſetting bones. Of late the inoculation for the ſmall-pox has been introduced into Arracan.

The ſtate of *agriculture* in the Birman empire is not particularly illuſtrated by Col. Symes. It ſeems, however, to be purſued with conſiderable avidity; and the ſoil in many parts is capable of cultivation, and its productions, which are naturally numerous, admit of further improvement. The cattle uſed in ſome parts of the country for tillage and draft are remarkably good; they put only a pair of them to the plough, which is little different from the plough of India, and turns up the ſoil very ſuperficially. In their large carts they yoke four ſtout oxen, which proceed with the ſpeed of a hand-gallop, and are driven by a country-girl ſtanding up in her vehicle, who manages the reins and a long whip with eaſe and dexterity. Many of the riſing grounds are planted with indigo; but the natives ſuffer the hills for the moſt part to remain uncultivated, and only plough the rich levels. They every where burn the rank graſs once a year to improve the paſture. The Birmans will not take much pains; they leave half the work to nature, which has been very bountiful to them. In the neighbourhood of Loonghee, many fields are planted with cotton, which thrives well; ſeſamum is alſo cultivated in this ſoil, and is found to anſwer better than rice, which is moſt productive in low and moiſt grounds. In the ſuburbs of Pagahm, there are at leaſt 200 mills employed in expreſſing oil from the ſeſamum ſeed. In this operation the grain is put into a deep wooden trough, and preſſed by an upright timber fixed in a frame: the force is increaſed by a long lever, on the extremity of which a man ſits and guides a bullock that moves in a circle; thus turning and preſſing the ſeed at the ſame time. The machine is ſimple, and yet effectually anſwers the purpoſe. Waggons form a caravan for travelling from the ſouthern country towards the capital. Of theſe there are ſometimes as many as 18, each of which is drawn by ſix bullocks, and is covered with a tilted roof of bamboo, overlaid with painted cloth, for throwing off the rain. They contain not only merchandize, but alſo whole families, the wives, children, monkies, cats, parroquets, and all the worldly ſubſtance of the waggoners. Each bullock has a bell under his throat. They travel ſlowly, from 10 to 15 miles a day. At night they are diſpoſed in a circle, and form a barrier, within which the carriers feed their cattle, light fires, and dreſs their victuals, ſecure from the attacks of tygers, which much infeſt the leſs populous parts of the empire.

We ſhall cloſe this article with a brief account of the *perſons*, *diſpoſition*, and *manners* of the inhabitants of the Birman empire, and of ſome of their ſingular *cuſtoms*. The Birmans, in their features, bear a nearer reſemblance to the Chineſe than to the natives of Hindooſtan. The women, particularly in the northern part of the country, are fairer than the Hindoo females, but leſs delicately formed; they are, however, well made, and in general inclined to corpulence; their hair is black, coarſe, and long. The men are not tall in ſtature, but active and athletic: their appearance is youthful from the prevalent cuſtom of plucking their beards inſtead of uſing the razor; they tattoo their thighs and arms into various fantaſtic ſhapes and figures, which in their opinion operate as a charm againſt the weapons of their enemies. Neither the men nor women are ſo cleanly in their perſons as the Hindoos of India, among whom diurnal ablution is a religious as well as a moral duty. Girls are taught, at an early age, to turn their arms in a manner which makes them appear diſtorted: when the arm is extended, the elbow is inverted, the inſide of the joint being protruded, and the external part bending inwards. The general diſpoſition of the Birmans is ſtrikingly contraſted with that of the natives of India, from whom they are ſeparated by a narrow range of mountains, which in many places admit of an eaſy intercourſe. Nevertheleſs, the phyſical difference between the nations could ſcarcely be greater, if they had been ſituated at the oppoſite extremities of the globe. The Birmans are a lively, inquiſitive race, active, iraſcible, and impatient. As the paſſion of jealouſy ſeems to have no influence among them, their wives and daughters are not concealed from the ſight of men; and they are allowed as free intercourſe with each other as the rules of European ſociety admit; but in other reſpects women have juſt reaſon to complain of their treatment. They are conſidered as very inferior and ſubordinate; and even the law ſtamps a degrading diſtinction between the ſexes; the evidence of a woman not being received as of equal weight with that of a man, and a woman not being ſuffered to aſcend the ſteps of a court of juſtice, but being obliged to deliver her teſtimony on the outſide of the roof. The cuſtom of ſelling their daughters, and even their wives, to ſtrangers, though confined to the loweſt claſſes of ſociety, and frequently the conſequence of pecuniary embarraſſment, is not regarded as ſhameful, nor is the female diſhonoured by it; and hence it is that women ſurrender themſelves the victims of this barbarous cuſtom with apparent reſignation. But no man, who leaves the country, is permitted to carry his temporary wife along with him. Every attempt of this kind is watched and guarded; and a ſhip, in which any females are conveyed away, can never return to a Birman port but under penalty of confiſcation of the property, and the infliction of a heavy fine and impriſonment on the maſter. Men are allowed to emigrate; but the exportation of women, would, in the opinion of the Birmans, impoveriſh the ſtate, by diminiſhing the ſources of its population. The females, who are reduced to the neceſſity of purſuing a courſe of proſtitution, are not at their own diſpoſal, nor are they allowed to receive the earnings of their unhappy profeſſion. They are ſlaves ſold by creditors to a licenſed pander, for debts more frequently contracted by others than themſelves. According to the laws of Pegu, he, who

who incurs a debt which he cannot pay, becomes the property of the creditor, who may claim him as a ſlave, and oblige him to perform menial ſervice until he liquidates the debt. His immediate relations are alſo liable to be attached; and innocent women are often dragged from domeſtic comfort, and are ſold to the licenſed ſuperintendant of the tackally, who, if they poſſeſs attractions, pays a high price for them, and reimburſes himſelf by the wages of their proſtitution. On the banks of a ſmall creek, between the town of Maindu and Baſſien, is a village called Mima-Shun-Rua, or the village of proſtitutes, which is inhabited altogether by women of this deſcription. Birman wives are ſaid to be in general chaſte and faithful; their ſedulous employment affording no leiſure for the corruption of their minds. A woman of the higheſt rank ſeldom ſits in idleneſs at home; her female ſervants, under her direction and ſuperintendance, like thoſe of the Grecian dames of antiquity, ply the various labours of the loom. Weaving is chiefly a female occupation; and moſt Birman families manufacture all the cotton and ſilk that are required for their domeſtic conſumption. The women in this country manage alſo the moſt important mercantile concerns of their huſbands, and attend to their intereſts in all out-door manufactures; they are to the greateſt degree induſtrious, and are ſaid to be good mothers; and they therefore merit a higher rank than that which is aſſigned them, and better treatment than they experience. The Birmans, in ſome reſpects, particularly towards their enemies and invaders, diſplay the ſeverity of barbarians, but in others all the humanity and tenderneſs of poliſhed life. At home they manifeſt an amiable benevolence, adminiſtering aid to the infirm, the aged, and the ſick; filial piety is inculcated as a ſacred precept, and its duties are religiouſly obſerved. A common beggar is no where to be ſeen; every individual is certain of receiving aſſiſtance, which, if he is unable to procure it by his own labour, is provided for him by others.

Among the Birmans, marriages are not contracted till the parties attain the age of puberty; the contract is purely civil; and the eccleſiaſtical juriſdiction has no concern with it. The law prohibits polygamy, and recognizes only one wife; however, concubinage is admitted to an unlimited extent. Concubines, who live in the ſame houſe with the legitimate wife, are obliged by law to perform menial ſervices for her; and when the huſband dies, they become the property of the ſurviving widow, unleſs he ſhall have emancipated them by a ſpecific act previous to his deceaſe. When a young man is deſirous of eſpouſing a girl, his mother, or neareſt female relation, firſt makes the propoſal in private; if the ſuit be well received, a party of his friends proceed to the houſe of the parents of the young woman, with whom they adjuſt the dotal portion. On the morning of the bridal day, the bridegroom ſends to the maiden three loongues, or lower garments; three tubbeeks, or ſaſhes; and three pieces of white muſlin; ſuch jewels alſo, ear-rings, and bracelets, as his circumſtances will admit: a feaſt is prepared by the parents of the bride, and formal writings are executed: the new-married couple eat out of the ſame diſh: the bridegroom preſents the bride with ſome læpack, or pickled tea, which ſhe accepts, and returns the compliment; and thus the ceremony ends.

When a man dies inteſtate, three-fourths of his property go to his children born in wedlock; and one-fourth to the widow, who is the guardian both of the property and the children, until the latter attain the age of maturity. A Birman funeral is ſolemnized with much religious parade and external demonſtration of grief; beſides the mourning relations, the attendants, who follow the corpſe, which is carried on a bier, are women hired for the occaſion, who precede the body, and chant a dirge-like air. The Birmans burn their dead; but as the ceremony of burning is expenſive, the bodies of paupers are either buried or caſt into the river. The mode of burning is as follows: the bier is placed on a funeral pile ſix or eight feet high, made of billets of dried wood laid over one another, with intervals for admitting a free circulation of air, ſo as to increaſe the flame. The Rhahaans walk round the pile, reciting prayers to Gaudma, until the fire reaches the body, when the whole is quickly reduced to aſhes, which are gathered and depoſited in a grave. Perſons of high diſtinction are embalmed, and their bodies are preſerved in ſome kioum, or religious building, ſix or eight weeks before they are committed to the funeral pile. Honey is ſaid to be the principal ingredient uſed for preſerving the body from putrefaction.

As to their food, the Birmans, compared with the Indians, are groſs and uncleanly. Although their religion forbids the ſlaughter of animals in general, yet they apply the interdiction only to thoſe that are domeſticated. All game is eagerly ſought after, and in many places publicly ſold; reptiles alſo, ſuch as lizards, guanas, and ſnakes, conſtitute a part of the ſubſiſtence of the lower claſſes. They are alſo extremely fond of vegetables.

Among the vegetable productions of this country we may enumerate the white ſandal-tree, and the aloexylum verum, much valued for the grateful odour of their ſmoke; the teak-tree (tectonatheca) already mentioned; the ebenoxylum verum, producing the true jet black ebony wood; the ſycamore fig, Indian fig, and banyan tree; the bignonia indica, nauclea orientalis, corypha ſeribus, one of the loftieſt of the palm-trees, and excoecaria Cochinchinenſis, remarkable for the crimſon under-ſurface of its leaves. To the claſs of plants uſed in medicine and the arts, we may refer the ginger and cardamum, found wild on the ſides of rivers, and cultivated in great abundance; the turmeric, uſed by the natives of the coaſt to tinge and flavour their rice and other food; the betel pepper, ſagaria piperita, and 3 or 4 kinds of capſicum; the juſticia tinctoria, yielding a beautiful green tinge; morinda umbellata, gamboge, and carthamus, furniſhing yellow dyes; the red wood of the lawſonia ſpinoſa, and Ciſalpina ſapan, and the indigo. The bark of the nerium antidyſentericum, called codagapala, and that of the laurus culilavan, the fruit of the ſtrychnos nux vomica, the caſſia fiſtula, the tamarind, and the croton tiglium, the inſpiſſated juice of the aloe, the reſin of the camphor-tree, and the oil of the ricinus, are occaſionally imported from this country for the European diſpenſaries. The cinnamon laurel, ſometimes accompanied by the nutmeg, the ſugar-cane, bamboo, and ſpikenard, are found throughout the whole country; the laſt on dry hills; and the bamboo and ſugar cane in rich ſwamps. The ſweet potatoe, ipomæa tuberoſa, mad-apple and love-apple (ſolanum melongena and lycoperſicon), nymphæa nelumbo, gourds, melons, water-melons, and various other eſculent plants, enrich, by cultivation, this country; and the plantain, cocoa-nut, and ſago palm, are produced more ſpontaneouſly. The vine grows wild in the foreſts, but its fruit is much inferior for want of cultivation, and through exceſs of heat, to that of the ſouth of Europe; but this country is amply ſupplied with the mango, pine-apple, ſapindus edulis, mangoſteen plum, averrhoa carambola, cuſtard-apple, papaw-fig, orange, lemon, and lime, and many other exquiſite fruits. The animals of the Birman empire correſpond with thoſe of Hindooſtan. The wild elephants of Pegu are very numerous; and, allured by the early crops of rice, commit great devaſtation among the plantations that are expoſed to their ravages. The king

is the proprietor of these animals; and one of his Birman majesty's titles is "lord of the white elephant, and of all the elephants in the world." The forests abound with tigers. Their horses are small, but handsome and spirited, hardy and active; and are frequently exported in timber-ships bound for Madras and other parts of the coast, where they are disposed of to considerable advantage. Their cows are diminutive, resembling the breed on the coast of Coromandel; but their buffaloes are noble animals, much superior to those of India, and are used for draft and agriculture; some of them are of a light cream colour, and are almost as fierce as tigers who dare not molest them. The ichneumon or rat of Pharaoh, called by the natives Ounbaii, is found in this country; but there is no such animal as the jackal in the Ava dominions, though they are very numerous in the adjoining country. Among the birds, which are the same with those of other parts of India, is one called the Henza, the symbol of the Birman nation, as the eagle was of the Roman empire; it is a species of wild fowl called in India the Braminy goose; but the natives of Ava do not deify this bird.

The Birmans seem to be in possession of several small islands in the gulf of Martaban, the Magnus Sinus of antiquity, and of others to the south and west. Symes's Embassy to the Kingdom of Ava, 3 vols. 8vo. passim. Asiatic Researches, vol. vi. p. 163—308. See ARRACAN, AVA, and PEGU.

BIRMINGHAM, is justly esteemed the greatest manufacturing town in England, and we may safely assert, that in the quantity, variety, elegance, and utility of its manufactured articles, it surpasses any town in Europe. To enable the stranger and foreigner to appreciate the general character of this place, with its various subordinate features, we will endeavour to depict them to the fancy, in a concise and perspicuous narrative. Its distinguishing characteristic is appropriately displayed in the following lines by Mr. Jago, in his poem of "Edge-hill."

"'Tis noise, and hurry all,—the throng'd street,
The close pil'd warehouse, and the busy shop.
With nimble stroke the tinkling hammers move;
While slow and weighty the vast sledge descends,
In solemn base responsive, or apart,
Or socially conjoined in tuneful peal.—
How the coarse metal brightens into fame,
Shap'd by their plastic hands! what ornament!
What various use!—Nor this alone thy praise,
Thine too of graceful form, the letter'd type!
The friend of learning, and the poet's pride."

The etymology of the name of this town is not readily attained, as it has been written Brumwycheham, Bromwycham, and various other ways; indeed, in common conversation, it is frequently pronounced Bromidgham. The town lies near the centre of the island, in the north-western extremity of the county of Warwick. It is in the diocese of Lichfield and Coventry, in the deanery of Arden, and in the hundred of Hemlingford. The superficial contents of the parish are 2864 acres. In 1800 here were 16,403 houses, 1875 of which were uninhabited. The whole population was 73,670, of whom 34,716 were males, and 38,954 were females.

In the scale of national importance, Birmingham bears an exalted situation; without recurring to its ancient history, the modern inhabitants have, by laudable industry, raised it perhaps to the acme of manufacturing and commercial fame. The sagacious and elegant Burke emphatically pronounces Birmingham the "Toy Shop of Europe." This designation must not, however, be taken in its literal sense, as the articles of utility made in this town far exceed those intended only for shew and ornament. Many of our cities are attractive for their venerable ruins and grand cathedrals, but of those Birmingham is destitute. The traveller, who delights in seeing the human race profitably employed to their own, and their country's advantage, will disregard the smoke which sometimes envelopes the town, and discern through the veil the bright beams of industry enlightening vast piles of riches: justice, however, will compel him to acknowledge, that profligacy has contrived to insinuate itself within too many dwellings of the labouring classes, producing idleness, discontent, drunkenness, and riots, of which several instances might be cited, exclusive of that grand convulsion which attended the commencement of that revolution in France, which in its consequences has so severely oppressed this, and almost every other nation. The Ikenild-street, one of the great Roman military roads, comes within a mile of Birmingham, and in Sutton park and Coldfield, four miles from the town, it remains nearly as perfect as if just completed; one of the principal evidences of the antiquity of Birmingham is, that it is contiguous to two Roman roads, the Ikenild, and Shirley streets.

The family of Birmingham were lords of this manor till 1537, at which period it is said to have been obtained by the duke of Northumberland, through the success of a deep-planned scheme. Having endeavoured in vain to purchase it, he contrived to make Edward Birmingham appear as an accomplice in a highway robbery, and offered him his interest to save a forfeited life, on condition of selling him the manor. The manor-house, which is now called the mote, still remains, though the site has been converted into a manufactory, and an apartment is shewn, where the ancient lords held their court-leets.

The parish of Birmingham is smaller than any in its neighbourhood. Mr. Hutton observes, that when Alfred founded a town, he allotted a much smaller space of land to it, than when he portioned a village, obviously intending the former for trade and commerce, and the latter for agriculture; this circumstance seems to prove that Alfred *found* Birmingham a *town*. "The buildings occupy the south-east part of the parish, which, with their appendages, are about 800 acres. This part being insufficient for the extraordinary increase of the inhabitants, she has of late extended her buildings along the Bromsgrove road, near the boundaries of Edgbaston, and on the other side planted some of her streets in the parish of Aston."

"The situation is elevated, and the soil one solid mass of dry, reddish sand, through which the water descends freely, thus making even the cellars comfortable habitations;" the same author adds facetiously, that though metals of various sorts are found in great plenty above the surface, we know of nothing below except sand, gravel, stone, and water. All the riches of the place, like those of an empiric in laced clothes, appear on the outside. "There is not any natural river in the parish, but in the lower parts of the town are two excellent springs of soft water, suitable for most purposes, one at the top of Digbeth, the other Lady well; and at the latter place are seven of the most complete baths in the kingdom. They cost 2000 *l.* in erecting, and are ever ready for the accommodation of hot or cold bathing, for immersion or amusement, with conveniency for sweating. That appropriated to swimming is 18 yards by 36, situate in the centre of a garden, in which are 24 private undressing houses, and the whole surrounded by a wall ten feet high."

Mr. Hutton mentions several instances of longevity, which seem to demonstrate either that the air is too pure to be rendered unwholesome by the smoke of the town, or that

ſmoke and ſteam are not ſo prejudicial to health as have been imagined: his inſtances are one perſon aged 100, a ſecond 103, a third 104, and a fourth 107, four upwards of 90, and 13 upwards of 80.

Birmingham is not a place a gentleman would chuſe to make a reſidence. Its continual noiſe and ſmoke prevent it from being deſirable in that reſpect.

Many ancient families who once flouriſhed at and near Birmingham, are mentioned by Mr. Hutton to have fallen into irretrievable decay; one inſtance is worth tranſcribing. "We have among us a family of the name of Middlemore, of great antiquity, deducible from the conqueſt: who held the chief poſſeſſions, and the chief offices in the county, and who matched into the firſt families in the kingdom, but fell with the intereſt of Charles I., and are now in that low ebb of fortune, that I have frequently, with a gloomy pleaſure, relieved them at the common charity board of the town."

It appears upon record, that in 1251, William de Birmingham, lord of the manor, procured an additional charter from Edward III. reviving ſome decayed privileges, and granting others; among the laſt was that of the Whitſuntide fair, to begin on the eve of Holy Thurſday, and to continue for four days. At the alteration of the ſtyle in 1752, it was prudently changed to the Thurſday in Whitſun week, that leſs time might be loſt to the injury of the manufacturers and their workmen. The ſame perſon alſo procured another fair, to begin on the eve of St. Michael, (which is commonly called the Onion fair, on account of the great quantity of onions ſold at the time) both of which are at this day in great repute. The horſe fair, which formerly was kept in Edgbaſton-ſtreet, was, in 1777, removed to Brick-kiln-lane; and that for beaſts, which uſed to be in the High-ſtreet, into Dale-end, in 1769.

Near Birmingham, on the London road, is Camp-hill, where the army of prince Rupert were encamped, during the ſiege in 1643. The inhabitants are accuſed of diſloyalty by lord Clarendon, for ſeizing the carriages which contained the royal plate and furniture. The prince, with 2000 men, had been commanded by the king to open a communication between Oxford and York, but the hardy and imprudent inhabitants of this town dared to oppoſe this force, with only a company of foot, and a troop of horſe. Though they had thrown up ſome ſlight works, and blockaded the ſtreets, yet the king's army forced through theſe trifling obſtructions, and entered the town ſword in hand. The earl of Denbigh, a royaliſt, was killed in this affair, as was a clergyman, who acted as governor for the parliament, and who refuſed quarter. Birmingham had a narrow eſcape from deſtruction, for the exaſperated commander ordered the place to be burnt, but ſome favourable circumſtance confined the conflagration to a few houſes in Bull-ſtreet.

The plague of 1665, was imported into the town in a box of cloaths brought to the White Hart inn. Hence the fatal poiſon inſinuated itſelf through the ſtreets and houſes, deſtroying great numbers of the inhabitants, whoſe bodies ſoon filled the church-yard, and alſo an acre of land at Ladywood-green, which was afterwards called the Peſt-ground.

Although ſome degree of eminence attached to Birmingham previouſly to the reign of Charles II., yet it is from that period that its rapid increaſe muſt be dated. Building leaſes then became common, and numbers of houſes aroſe to accommodate the increaſing population which aſſembled, in conſequence of the cultivation of the mechanical arts.

About the year 1700, the number of ſtreets in Birmingham was only 30, but now there are nearly 250; beſides, ſeveral of the oldeſt are conſiderably improved and augmented. This will, in ſome meaſure, aſſiſt the imagination in comprehending the amazing increaſe of the town in ſize, wealth, and manufactures, during that time; and it is no preſumption to ſuppoſe, that it has not yet arrived at its zenith; one inſtance of increaſe will be ſufficient to point out the general improvement. Between the roads to Wolverhampton and Dudley, there were only three houſes March 14, 1779. By that day twelve months they increaſed to 55, and March 14, 1781, there were 144. The ſame day in 1791, there was an addition of 833.

Thomas Sherlock, biſhop of London, purchaſed of the ladies of the manor in 1730, land worth 400l. per annum; in 1758, the income was doubled. He always refuſed to let it on building leaſes, alleging, that his ſucceſſor would be compelled to remove the rubbiſh at the expiration of the terms; ſir Thomas Gooch, who held the land after the above prelate, procured an act about 1766, for ſetting aſide the prohibitory clauſes of the biſhop's will; immediately let the ground, and improved the rents to 2400l. per annum; it appears from the books of the poor-rates, that leſs than 5000 houſes pay the parochial dues, and more than 8000 houſes are exempt; this fact denotes the prevailing deſcription of population.

Manufactures, &c. The extraordinary increaſe in the ſize, population, and proſperity of Birmingham, ariſes principally from its proximity to the coal mines, from the nature of the ſoil, from its canals, from the ſucceſsful exertions of a few individuals in ſome manufacturing ſpeculations, and from its being exempt from borough, and corporate laws and reſtrictions. To inveſtigate and detail the whole of theſe cauſes, with their effects, would occupy more ſpace than we can conſiſtently appropriate. The moſt prominent characteriſtics, however, ſhall be narrated. To the late John Taylor, eſq. a man of great induſtry and ingenuity, the public are indebted for the gilt button, the japanned and gilt ſnuff-box, with the numerous claſs of enamels; alſo the painted ſnuff-box, at which employ, one ſervant earned 3l. 10s. per week, by painting them at a farthing each. In his ſhops were weekly manufactured buttons to the amount of 800l. excluſive of other valuable productions, and eighty guineas have been given him for a ſingle toy made at his ſhop. He died in 1775, at the age of 64, after acquiring a fortune of 200,000l. His ſon is now partner in one of the largeſt provincial banking houſes in England.

The greateſt and moſt noted manufactory of this place, and perhaps in Europe, is that at Soho, about two miles from Birmingham. This is the property of Meſſrs. Boulton and Watt, who have advanced certain pieces of mechaniſm and productions of art to a ſtate of excellence, that have excited the aſtoniſhment and admiration of nations. The large warehouſes, work-ſhops, and the elegant manſion of the former gentleman, cover the declivities of a hill, which a few years back was a barren heath, tenanted only by rabbits, and a warrener's hut; now this once deſolated ſcene is converted into an emporium of arts and beauties. Such are the wonderful powers of human ingenuity and induſtry. In 1757, this ſpot, with ſome contiguous land, was leaſed for 99 years, to Meſſrs. Ruſton and Evans, who erected a houſe and a mill for rolling metal, &c. At Lady day, 1762, Mr. Boulton bought the whole, and removing to it ſoon afterwards from Birmingham, commenced the preſent extenſive premiſes, which were nearly completed in 1765, at an expence of 9000l. He now admitted a partner, Mr. Fothergill, into the concern, and

 eſtabliſhed

eſtabliſhed an extenſive correſpondence throughout Europe. To obtain and ſupport a reputation, every encouragement was afforded to men of genius in drawing, modelling, and other branches of the arts. An imitation of or molu in vaſes, tripods, and candelabras, was adopted, accompanied by ſo much ſkill and elegance, that univerſal approbation followed; this led to the manufacture of wrought ſilver, and an application was made to parliament in 1773, for an aſſay office, to be eſtabliſhed at Birmingham. The polygraphic art had its origin at Soho. This method of copying pictures in oil, by a mechanical proceſs, was conducted by F. Eginton, who has ſince executed a great number of fine ſpecimens of painting, or ſtaining of glaſs. The encauſtic mode of ſtaining glaſs, or fixing the vivid and fine graduating colours upon that tranſparent material, was ſuppoſed to be loſt, but it has been revived and brought to great perfection by this gentleman. Since 1784, he has executed ſeveral large windows for various cathedrals, churches, and gentlemen's manſions. (See GLASS-PAINTING.) Among the various machines, &c. invented and conſtructed at Soho, there is one entitled to diſtinguiſhed notice for its great national utility and importance. This is the *ſteam engine*, which has acquired extraordinary force and improvements by Mr. James Watt, one of the proprietors of the Soho firm. To him the ſcientific world is much indebted for various other inventions and improvements in mechanics. With a vigorous comprehenſiveneſs of mind, he embraces every mathematical and mechanical ſubject from the ſimpleſt to the moſt complex and profound. He procured a patent for the ſteam engine in 1768, and ſeven years afterwards, entering into partnerſhip with Mr. Boulton, began to conſtruct thoſe machines at Soho. Since that period, they have been generally adopted in the mines and manufactories all over the kingdom. (See STEAM ENGINE.) The following liſt of curious and uſeful articles are manufactured at theſe works, which, when fully employed, give ſupport to upwards of 600 labourers. Buttons of all kinds; poliſhed ſteel, and jettina ſteel-toys; poliſhed ſteel watch-chains; patent cork-ſcrews, &c. Buckles and lachets of all ſorts; plated and ſilver goods for the dining and tea-table, ſide-board, &c.; medals and coins of various ſizes and metals. The late beautiful new coinage of copper, and alſo the re-ſtamped dollars; all come from the Soho mint. The coining mill or engine firſt erected here in 1783, has been much improved ſince that period, and is now adapted to work eight machines at once, each of which will ſtrike from 70 to 84 pieces per minute, the ſize of a guinea; or between 4,000 and 5,000 per hour. Thus the eight machines will work between 30,000 and 40,000 coins in one hour. Theſe machines are operated on by the ſteam-engine, and perform the following proceſſes: 1ſt. rolling the maſſes of copper into ſheets; 2nd, fine rolling of the ſame cold, through cylindrical ſteel rollers; 3rd, clipping the blank pieces of copper for the die; 4th, ſhaking the coin in bags; 5th, ſtriking both ſides of the coin, and milling it, at the ſame time diſplacing it, and placing another for the ſame operation. To its other properties, this ingenious machine adds the almoſt magical one of preventing fraud, by keeping an accurate account of every coin which paſſes through it. Dr. Darwin has deſcribed this ſingular apparatus in the following appoſite poetical lines:

——"Now his hard hands on Mona's refted creſt,
Boſom'd in rocks, her azure ores arreſt;
With iron lips his rapid rollers ſeize
The lengthened bars in their expanſive ſqueeze;
Deſcending ſcrews with pond'rous fly-wheels wound
The tawny plates, the new medallion's round;
Hard dies of ſteel, the cupreous circles cramp,
And with quick fall, his maſſy hammers ſtamp.
The harp, the lily, and the lion join,
And George and Britain guard the ſplendid coin."

Rolled metals of all kinds of mixtures, are prepared here; beſides pneumatical apparatus, large and portable; alſo copying machines, and in ſhort, almoſt every ſort of article for uſe or ornament.

Beſides the manufactories already named, Birmingham contains ſeveral others, which are entitled to our conſideration; and although we cannot allow ſpace for particulars, yet we muſt not paſs them altogether unnoticed.

Meſſrs. Richards's in High-ſtreet, is ſtyled the toy-ſhop of Birmingham; the elegance and variety of the articles are not to be equalled, with the exception of the ſhow-room at Soho. Mr. Clay's japan manufactory is not leſs celebrated, particularly when it is conſidered that the japan is fixed on common brown paper. To thoſe may be added Clarke and Aſhmore's manufactory of whips. Gill's gun, bayonet, and ſword manufactory, ſuppoſed to be one of the beſt in the world; and Galton's for ſporting guns. Previous to the reign of William III. guns were moſtly imported from Holland; but that monarch having once expreſſed ſome regret at this circumſtance, and deplored the neceſſity of ſending abroad for the article, Sir Richard Newdigate, M.P. for Warwickſhire, being preſent, aſſured the king that his conſtituents would undertake to ſupply the demands of government. An order was given, and being readily and correctly executed, Birmingham has continued from that period to be the great and principal place of manufacture for this deſtructive weapon. See GUN.

Leather appears to have been manufactured here in great quantities in the early periods of the hiſtory of Birmingham; but in 1795, there was but one tanner in the place.

Within the laſt century, the manufacture of ſteel into almoſt every kind of toy and ornament took its riſe: a large ſtreet bears the name of Steel-houſe-lane, from the extenſive works carried on there. Here are alſo very large braſs works erected on the banks of the canal, on the road to the five ways, near which ſtand the ruins of the manſion built by the late John Baſkerville, who made great improvements in the art of printing. See BASKERVILLE.

Places of Amuſement and Curioſity. In New-ſtreet is a muſeum, or repoſitory of natural and artificial curioſities, the property of J. Biſſet, a gentleman who has publiſhed ſome ingenious poems and uſeful books. His "Magnificent Directory," is a novel, handſome, and uſeful work, in which are contained elegantly engraved, emblematical cards of addreſs of a great number of the merchants, manufacturers, tradeſmen, &c. throughout England.

The firſt *Theatre* eſtabliſhed at Birmingham was ſituated in Moor-ſtreet about 1740; that in King-ſtreet was erected 1765, and enlarged 1774; in the ſame year it was tranſferred to a religious ſociety; and another built in New-ſtreet, at an expence of 5660l. and managed with great ſucceſs by Mr. Yates. In 1791, it was burnt by ſome incendiaries, who have never been diſcovered; ſince that period, the proprietors have rebuilt it in a very ſplendid manner for 14,000l. with an aſſembly room and a tavern annexed to it. Mr. Macready of Covent Garden theatre, is the preſent manager, who generally preſents his audiences with the beſt London performers during the ſummer months. Concerts and muſical parties are held weekly during winter; and the ſummer produces a variety of public gardens, the principal of which are Vauxhall and Spring-gardens.

Government. Birmingham is governed by three acting magistrates; the officers chosen annually are the high-bailiff, who inspects weights and dry-measures, and the markets; the low-bailiff, who summons juries, and chuses all the other officers; two constables and one headborough; two high tasters, who examine the quality of beer and its measure; two low tasters or meat conners, who inspect the meat exposed to sale, and cause that to be destroyed which is unfit for use; two affeirers, and two leather-sellers, whose offices are now only nominal.

Deritend, a hamlet of Birmingham, sends its inhabitants to the court leet of that town, where all the above officers are chosen and sworn, in the name of the lord of the manor.

An act of parliament passed in 1752, which established a *Court of Requests*, consisting of 72 commissioners, three of whom are a quorum; they sit every Friday morning in a room of the Red Lion inn; the clerks attend to give judicial assistance, who are always professors of the common law, and chosen by the lord of the manor and the commissioners for life: ten of the commissioners are ballotted out every other year, and ten others elected from among the inhabitants. The beneficial effects of a humane society for the recovery of suspended animation were first extended to Birmingham in 1790. About the same period a committee of respectable inhabitants was established to watch over the common interests, under the title of the "Commercial Committee."

In 1791, W. Villars, esq. then high bailiff, opened a market for hay, straw, &c.

A public library was founded in 1779, which has flourished greatly, and contains nearly 10,000 volumes, supported by upwards of 500 subscribers. An elegant pile of building was erected in Withering-street for the purposes of the institution in 1797. A rival made its appearance in 1796, with every prospect of success; besides these, there are medical and law libraries, and many reading societies. Birmingham contains two churches, and four chapels; besides several meeting-houses.

Churches. St. Martin's church, denominated the Old church, was raised previously to the year 1300. It is of stone, and occupies the site of, or is the first sacred building belonging to the place. In 1690, it was thought necessary to case the church and tower with brick. The walls support the arms and monuments of several titled and ancient families. Under the south window are two of white marble, one of which is supposed to have been erected for William de Birmingham, who was captured by the French at the siege of Bellegard in 1297. He wears a short mantle, &c. and bears a shield with the bend lozenge. This church was repaired and altered in 1786, at an expence of 4000l. The patronage belonged to the family of Birmingham till 1537, since which period it has been possessed by the Dudleys, the crown, the Marrows, the Smiths, and finally the Tenants. The rectory was valued in the king's books 1291, at 5*l.* per annum, and in 1536, at 19*l.* 3*s.* 6*d.* The income is now upwards of 1000*l.* and expected to be 2000*l.* after the expiration of certain leases.

St. Philip's, or the *New* church, is a handsome pile of building, but how Mr. Hutton or any other person could fancy and say that the steeple is erected after "the model of St. Paul's in London, but without its weight," is to us inconceivable, as there is not a line of it that reminds the spectator either of the dome or turrets of the metropolitan edifice. It must be allowed that the tower of St. Philip's finishes with an attic and a diminutive cupola, but there ends the resemblance. This church is advantageously situated on an eminence, and the site was given by Robert Philips, esq. It was begun by act of parliament in 1711, under a commission consisting of 20 of the neighbouring gentry appointed by the bishop of the diocese under his episcopal seal. In 1715, it was consecrated, and finished in 1719, at the real cost of only 5012*l.* though the estimated value was nearly 20,000*l.* This circumstance arose from the gift of materials, &c. The church-yard consists of four acres, and is intersected by handsome walks, shaded by trees in double and treble rows, and is surrounded by elegant buildings. Two thousand persons may be conveniently accommodated in St. Philip's church, which has contained nearly 3000. William Higgs, first rector, founded a theological library for the use of the neighbouring clergy, and bequeathed 200*l.* to augment it. The Rev. Spencer Madan erected a room in 1792, adjoining the parsonage, and termed it the parochial library. The rectory is worth about 300*l.* per annum.

St. Bartholomew's Chapel, capable of containing 800 persons, was erected in 1749, on a site given by John Jennens, esq. an opulent land-holder of Birmingham. Mrs. Jennens, through the good offices of Mrs. Weaman, added 1000*l.* and the remaining sum was received in contributions from pious inhabitants. The chapel and tower are handsome, and the former presents a line north and south. The altar-piece is the gift of Basil, earl of Denbigh, and the communion plate that of Mary Carless.

St. Mary's Chapel was erected in 1774; on a spot of ground given by Mary Weaman, whose family has the patronage. The incumbency is valued at 200*l.* per annum.

St. Paul's Chapel is a stone building erected in 1779, by virtue of the same act which founded St. Mary's. Charles Colmore, esq. gave the ground; a steeple is intended, and the east window was decorated in 1791, with painted glass, representing the conversion of St. Paul, by Francis Eginton, who received 400 guineas for the same.

The house of a celebrated physician of Birmingham, Dr. Ash, was purchased in 1789 by an attorney, who converted it into an elegant chapel, at the expence of his own ruin, where he caused the service of the church to be chanted by a numerous choir, accompanied by an organ. Dr. Croft, and some other clergymen, afterwards purchased it, and engaged to officiate there regularly. The congregation chiefly consists of soldiers from the neighbouring barracks.

Dissenting Meeting Houses. Old Meeting-street received its name from the old meeting erected in the reign of William III. which was destroyed in 1791 by the mob. The trustees recovered 1390*l.* 7*s.* 5*d.* damages, and rebuilt the present building, at an expence of 5000*l.*

The *New Meeting* built 1730, shared the fate of its parent in 1791, and has never been rebuilt. The celebrated Dr. Priestley presided over the spiritual concerns of this place of worship at the period of its destruction, and narrowly escaped personal injury, or perhaps death, from the furious populace. He fled, and finally retired into exile, within the state of Pennsylvania, where he died 1804, with the fame of an excellent philosopher and experimentalist. (See PRIESTLEY.) The trustees having lost their licence, could not recover damages, but the king granted his warrant upon the treasury for 2000*l.*

The *Union Meeting* in Livery-street, originally an amphitheatre for the exhibition of equestrian exercises, being unoccupied at the period of the riots, the congregations of the two meetings hired, and converted it into a place of worship. After the re-erection of the old meeting, they separated, resigning the Union meeting to the new meeting

assembly, who occupy it till their place of worship is re-built.

Carrs-Lane Meeting, a kind of chapel to the old meeting, was erected in 1748. This society has 800l. bequeathed by John England in 1771, and 40l. 18s. per annum, termed Scot's trust.

A *Baptist Meeting* in Canon-street, was founded in 1738, and has continued prosperously to the present period.

The *Quakers* have a meeting in Bull-street, frequented by a large, peaceable, and rich congregation; behind it is a spacious burial-ground. The methodists are now very numerous; previous to 1782, there was but one congregation, whose place of worship had been a theatre; whence they removed to a splendid meeting in Cherry-street, erected at an expence of 1200l. John Westley, their chief priest, preached in it for the first time July 7, in the above year; three others have since been erected and purchased in Colehill-street, Deritend, and Newhall-street. The last was erected as a new Jerusalem temple, for the Swedenborgians, but in too magnificent a style for their revenues. The methodists bought it, and the original possessors built a smaller temple.

A small *Roman Catholic Chapel* is situated at Easy-hill, in the place of one destroyed during the destructive riots. A Jewish synagogue, a baptist's meeting, and an independent meeting, lady Huntingdon's meeting, and some other places of worship, are found in this town, which, like most manufacturing places, is distinguished for its number of dissenters of different sects.

Charities. Some of the streets of Birmingham are kept in repair by emoluments arising from small estates. William Lench, who lived in the reign of Henry VIII. bequeathed certain estates to the town, in trust to sixteen inhabitants, for repairing the streets. This person founded the almshouses in Steel-house lane for poor widows. Fentham's trust is 100l. per annum, and applied to teaching poor children reading, and for cloathing ten poor widows. The date of the donation is 1712. Mr. Crowley gave in 1733, six houses for the support of a school for ten girls.

The *Free School* was erected on the site of the guild of the holy cross, which had an endowment of lands for the maintenance of two priests, worth twenty marks per annum, given by Thomas de Sheldon, John Colshill, John Goldsmith, and William Attslowe. In 1393, the bailiff and inhabitants obtained a patent for augmenting the foundation, and adding a brotherhood, which flourished till the general dissolution, and was then valued at 31l. 2s. 10d. per annum. Edward VI. granted the lands belonging to the guild in 1552, at the suit of the inhabitants to nineteen persons, as bailiff and governors of the free grammar school of king Edward VI., to hold in common soccage at a rent of 20s. per annum. Their successors erected the present building in 1707, which is large and handsome, has a neat tower in the centre, and a statue of Edward VI. in front. The chief master's salary is 120l. the second 60l. two ushers 40l. each for writing and drawing, and a librarian 10l. There are seven exhibitions of 25l. per annum each for the university of Oxford, and the possessions are valued at 1200l. per annum.

The *Blue Coat School* was erected 1724, but enlarged and improved in 1794, at an expence of 2500l. The revenues are 1327l. and 150 boys and 40 girls receive the benefits of the institution.

The *Dissenter's Charity School* was held at the old meeting, but after that was destroyed, a building was purchased in Park street, and has been much improved. The children received are 40 boys and 20 girls.

The *Work-house* erected 1733, cost 1173l. a wing was added for an infirmary 1766, and another in 1779, at an expence of 1100l. The inhabitants pay a rate of 6d. in the pound, which raises 17,000l. per annum, and relief is afforded to 7000 persons. There are twelve overseers.

The *General Hospital* was erected 1766, and two wings were added 1791. It is supported by voluntary contributions, and many large bequests; the physicians generally give their assistance gratis.

The *Prisons* in Peck-lane and Deritend are disagreeable and unwholesome, and both are licensed as public houses.

The *Canal* between this place and Wednesbury, was made in consequence of an act obtained in 1767. It is twenty-two miles in length, uniting with the Staffordshire canal; the shares were 140l. each, and the expence 70,000l.; they sold in 1782 for 370l. each, and in 1792 for 1170l. Sir Thomas Gooch leased the proprietors six acres of land at 47l. per annum, which they converted into a wharf, and erected a handsome office on it. The boats are drawn by one horse, and are about twenty-five tons burthen. Coals are little more than half the price they were before this canal was made. Several other canals, equally beneficial, have since been completed, opening a communication between this town, and almost every principal town in the kingdom.

The *Barracks* stand on five acres of land, held by government at one penny per yard. They were erected in 1793 for 13,000l., and will accommodate 162 men.

There are three extensive Breweries near Birmingham, Richards's in Deritend for ale, Giles and Forrests, Worstone-lane, for ale and porter, and the Britannia, Walmer-lane, belonging to Clay and co.

The riots, already alluded to, constitute an unpleasant feature in the history of this town, and whilst they serve to characterize the folly and infatuation of the lower classes of society, will, we trust, operate as a warning example to the rising generation. A few persons assembled at the hotel Birmingham, July 14, 1791, to celebrate the anniversary of the French revolution. A mob collected round the house, broke the windows, and immediately proceeded to Dr. Priestley's new meeting. This, and the old meeting, were soon burnt to ashes, and the doctor's house and furniture, with his valuable library, apparatus, and MSS. shared the same devastating fate. On July 15, the mansions of John Ryland, esq. at Easy-hill, and Bordesley-hall, the seat of John Taylor, esq. together with the house, stock in trade, books, furniture, &c. of Mr. Hutton, author of the "History of Birmingham," were destroyed. Saturday the 16th witnessed the destruction of Mr. Hutton's house at Saltley, the residences of George Humphreys, William Russel, and John Taylor, esqrs. The latter, Bordesley-hall, was occupied by lady Carhampton, mother to the duchess of Cumberland, but neither her blindness through age, nor connection with the king, could prevent the mandate of removing her furniture from the mob, who frantickly offered to assist: "She was therefore, like Lot, hastened away before the flames arose, but not by Angels." The reverend Mr. Hobson's and Mr. Harwood's houses were next burnt; those of the Rev. Mr. Coates, Mr. Hawkes, and Thomas Russel, esqrs. were plundered. On Sunday the 17th, Kingswood meeting perished in flames, the parsonage-house, and that of Mr. Cox, licensed for public worship. The mob this day plundered Edgbaston-hall, Dr. Withering's, and attacked Mr. Male's house, but hearing in the evening, that a troop of horse approached, they gradually dispersed, after destroying property to the amount of 60,000l. To reimburse the sufferers, an act was obtained in 1793. The war succeeding, greatly injured Birmingham, and this cannot be more

clearly proved than by referring to the 1875 uninhabited houses in the year 1800. There are two morning papers published at Birmingham; Aris's Birmingham Gazette, and Swinney's Birmingham Chronicle, &c. Mr. Swinney also carries on a considerable type foundery, which is the only provincial one in the kingdom. "This neighbourhood," says Mr. Hutton, "may justly be deemed the seat of the arts, but not the seat of the gentry. None of the nobility are near us, except William Legge, earl of Dartmouth, at Sandwell, four miles from Birmingham. The principal houses in our environs are those of the late sir Charles Holte at Alston; sir Henry Gough Calthorpe at Edgbaston; George Birch, esq. at Handsworth; John Gough, esq. at Perry; and John Taylor, esq. as Bordesley and at Moseley, all adjoining to the manor of Birmingham; exclusive of these, there are many retreats of our first inhabitants, acquired by commercial success." Hockley Abbey, near Soho, is the residence of Mr. Richard Ford, an ingenious smith, who had the honour of presenting his majesty with an iron carriage made by himself. It is a modern curious building, with the upper part representing a ruin, and is surrounded by beautiful grounds and walks, interspersed with fanciful curiosities. The most *considerable* seats in the vicinity of Birmingham, are Hagley, 12 miles distant; Enville, 18 miles distant; and the Leasowes, six miles distant. The latter will long be preserved in the memory of every reader of Shenstone, whose creation it was, and whose taste it displayed in an eminent degree. It now belongs to Charles Hamilton, esq. who has judiciously restored the neglected beauties of the place. Hagley, the seat of lord Littelton, has been particularly celebrated in the writings of Pope, Thomson, Hammond, and other poets. Enville, the seat of the earl of Stamford, is a scene of great natural beauty. For further particulars relating to Birmingham, its manufactories and neighbourhood, see Hutton's "Hist. of Birmingham," 8vo. Shaw's "Hist. of Staffordshire," fol. "A companion to the Leasowes, Hagley, and Enville," 12mo. Bisset's "Poetic Survey round Birmingham," 8vo. Phillips's "History of Inland Navigation," 4to. &c.

BIRON, Armand, de Gontault, baron of, in *Biography*, was born about the year 1524, and rose gradually from the condition of a page to Margaret queen of Navarre, to the rank of marshal of France, which he obtained from Henry III. in 1577. After the death of this king, he was one of the first to acknowledge Henry IV. as lawful possessor of the crown, and served him with advantage at the battles of Argues and Ivri. At the close of the action, to the victorious issue of which he contributed, by his command of the reserve, though he was not engaged, he said to Henry, who had much exposed himself, "You, Sire, have acted the part of Biron to day, and he has acted yours." Under Henry III. he occupied the post of lieutenant-general of Guienne, in which he gained great advantages over the Calvinists; and he also reduced part of Normandy to the obedience of Henry IV. To his son, who solicited a small force for the purpose, and with the promise of ruining the army of the dukes of Parma and Mayenne, he replied; "I believe you may; but then we shall have nothing farther to do but to plant cabbages at Biron." Soon after, in 1592, he lost his life by a cannon ball at the siege of Epernai. In his military character, he was a rigid disciplinarian, and required prompt obedience. When an officer, whom he had commanded to burn a house, desired an order to this effect, under his own hand, Biron instantly discharged him, alleging "he would have nothing to do with people who were afraid of justice; and that every soldier who dreaded a pen, must tremble at a sword." He was a polite scholar, but of a mercenary and intemperate disposition. He wrote "Commentaries" of his transactions, which were lost. Gen. Dict. Nouv. Dict. Hist. Mod. Un. Hist. vol. xxi. p. 54, &c.

Biron, Charles de Gontault, duke of, the eldest son of the preceding, was born in 1562; and having served under his father, he distinguished himself in several battles and sieges. Henry IV. distinguished him by tokens of forbearance and favour, on account of his faithful and active services. He created him admiral of France in 1592, marshal and governor of Burgundy in 1594, and honoured him with erecting the barony of Biron into a dukedom and peerage. He also employed him in several important diplomatic embassies: but his pride and ambition rendered him incapable of gratitude. Allured by flattering prospects, he engaged with Spain and Savoy in a conspiracy against his master; and at length his haughty conduct caused him to be arrested for his treasons, tried, and condemned to lose his head; and the sentence was executed in the court of the bastile, July 31, 1602. He submitted with reluctance, and betrayed cowardice at the time of his death. He was vain, arrogant, and malicious; he changed his religion twice before he attained the age of 16 years, and manifested a total want of principle and integrity. His passion for gaming reduced him, notwithstanding his rapacity, to various difficulties; and he was only estimable when he was actively employed. Although the king incurred some blame for sacrificing the life of a servant who had been eminently useful, and honoured with his peculiar friendship, Biron deserved to suffer as a traitor. Gen. Dict. Nouv. Dict. Hist. Mod. Un. Hist. vol. xxi. p. 99, &c.

Biron, in *Geography*, a town of France, in the department of the Dordogne, $3\frac{1}{2}$ leagues south of Belvez.—Also, an island in the gulf of St. Lawrence, 26 leagues west of cape Anguilla. N. lat. 47° 50′. W. long 61° 5′.

BIROSTRIS, in *Conchology*, a species of Bulla, that inhabits Java. The shell has two beaks, which are elongated and smooth; margin thickened outwardly. Gmelin, Lister. This species is not unlike *Bulla vulva*, but is smaller, being only about the size of a horsebean; and it is also narrower; smooth, whitish, flesh-coloured; beaks unequal, obliquely truncated, and one of them a little ascending; aperture nearly equal, but widest at one end.

BIROTA, *Birotum*, from *bis* and *rota*, *wheel*, a kind of vehicle denominated from the two wheels whereon it moved. The birota, by the constitution of Constantine, was drawn by three mules, and carried 200 pounds weight; by which it was distinguished from the *rheda*, which carried 1000 pounds, and was drawn by eight, and in winter by ten mules.

BIRR, in *Geography*, or, as it is called by act of parliament, *Parsons Town*, the largest post and market town in the King's county, Ireland, situated on the river called the *Little Brosna*, which divides the King's county from the county of Tipperary, on the south west. This town has breweries, distilleries, malt-houses, cloth and serge manufactories, a bank, an excellent market, and a barrack for two companies of foot. The castle at the western extremity of the town, belonging to the family of Parsons, was besieged by Sarsfield, lord Lucan, general of the Irish, in the war of the revolution of 1688, and relieved by general Kirk. There is a statue of William, duke of Cumberland, standing on a stone pillar of the Doric order, erected in 1747, in honour of the victory at Culloden. Birr is 65 miles west by south from Dublin, 6 south from Banagher on the Shannon, and near 12 from Portumna.

N. lat.

N. lat. 53° 4′. W. long. 7° 52′. Beaufort.—Coote's Survey of King's County.

BIRRETUM, or BIRETUM, in *Writers of the Middle and Lower Ages*, a thin black cap or cover for the head, made of linen, fitted close to the head, and pointed by a pyramid, anciently worn by priests, soldiers, doctors, &c. Du-Cange. The word *birretum*, sometimes written *birretum* and *biretum*, is also applied to a cap or coif of a judge, or serjeant at law. The birretum also denotes the cap worn by the novices in the Jesuit's order, formerly of a square, now a round figure. The birret was the ordinary cover of the head in France 500 years ago. It took its denomination from *birrus* or *birrum*, the coat anciently used by ecclesiastics; with which the cap was then of a piece, and made part of it; so that the whole covered, not only the head, but the shoulders. Afterwards, when they began to retrench the lower part, still retaining the upper, it was no longer called *birrus*, or *birrum*, but diminutively *birret*, or *birretum*.

BIRRUS, an ancient habit worn by the Christians in Africa. The word is also written *byrrus*, supposed to be formed from πυῤῥος, on account of its red colour. Some will have the birrus an episcopal habit. Others extend it to all the clergy. Others, on juster grounds, make it the common coat of all the Christians in that quarter.

BIRS, or BIRSH, in *Geography*, a river of Swisserland, which runs into the Rhine near Basle. Near this river, and not far from the town of Basle, are the hospital and burying ground of St. James, famous in the history of Swisserland for a desperate combat in 1444, between the Swiss and the dauphin of France, afterwards Lewis XI., in which Swiss valour and intrepidity were very signally displayed. Upon this occasion 1500 Swiss charged 8000 of the enemy's cavalry with such determined and well conducted valour, as to drive them back; and when the enemy received reinforcement, the Swiss renewed the assault, and forced them to repass the river Birs, and join the main body of the army. The Swiss, encouraged by this success, and also exasperated with the most spirited indignation against the invaders of their country, rashly attempted, against the remonstrances of their officers, to force their passage over a bridge guarded by a large body of the enemy; but this gallant effort not succeeding, they threw themselves into the river, and gained the opposite shore, in the face of a battery of cannon, that was playing against them. But they were now opposed to an army of 30,000 men advantageously posted in an open plain. In these desperate circumstances they had no alternative, but to throw down their arms, or gloriously expire. They bravely preferred death; 500 took possession of a small island near the bridge, and after resolutely defending themselves to the last extremity, were cut to pieces. A like number forced their way through the ranks of the enemy, and marched towards Basle; when they were opposed by a large party of horse posted to prevent the inhabitants of the town from sallying forth to the relief of their countrymen. Being now surrounded on all sides, they threw themselves into the hospital of St. James; and, lining the walls of the burying-ground, resisted for some time the united assaults of the French army. At length the hospital being set on fire, and the cannon having battered down the walls of the burying-ground, they no longer fought in hopes of victory; but still resolving to sell their lives as dearly as possible, they continued to defend themselves to the last gasp.

Æneas Sylvius (afterwards pope Pius II.) relates, among other actions of singular valour excited by this heroic troop, the following instance, that deserves to be recorded. Four French soldiers assaulted a single Swiss, and having killed and stripped him, proceeded to insult the corpse; one of his companions, incensed at this brutal action, seized a battle-axe, rushed upon the four, slew two of them, and drove the others to flight; then flinging the dead body of his friend upon his shoulders, carried it to a place of security; and, returning to the attack, fell by the hand of the enemy. Of the whole number, only 16 escaped from the field of battle; and these, agreeably to the old Spartan discipline, were branded with infamy, for not having sacrificed their lives in defence of their country. Among those who were desperately wounded and left upon the field, only 32 were found alive. The names of many of these glorious combatants were registered, and still remain upon records. The loss of the enemy was great; and they were effectually prevented from prosecuting their designs upon Swisserland, and compelled to retire in a shattered state into Alsace. Lewis himself declared that such another victory would ruin his army. This combat may be considered as forming a remarkable era in the history of the Swiss; for it gave rise to their treaty with Charles VII.; being the first alliance which they contracted with France. The Swiss still talk of this famous action with the warmest enthusiasm; and the inhabitants of Basle form parties every year, and go to an inn situated near the hospital and burying-ground, in order to commemorate, in a red wine produced from some vineyards planted on the field of battle, the heroic deeds of their countrymen, who so gloriously sacrificed their lives. This wine is highly prized by the Basileans, and called "the blood of the Swiss."

By the side of the Birs there is a fertile plain, on which are several pleasant villages; and the extremity of the plain is closed by a rock, through which opens the celebrated pass called "Pierre Pertuis," which see. At the bottom of this rock, the Birs bursts from the ground in several copious springs, and turns two mills within a few paces of its principal source.

BIRSK. See BORSK.

BIRSKA, a river of Siberia, which runs into the Lena, 28 miles south-west of Olekminsk.

BIRSTEIN, a town of Germany, in the circle of the Upper Rhine, and county of Isenberg; 26 miles E. N. E. of Frankfort on the Mayne.

BIRTERBURY, or BITTERBUI *Bay*, a considerable bay on the west coast of Ireland, in the county of Galway, open to the Atlantic. It is capacious and well sheltered, has good ground, and will admit the largest ships, which may ride here from four to eight fathoms water; yet it is probably never visited, except by fishermen and smugglers. N. lat. 53° 20′. W. long. 9° 53′ 30″ from Greenwich. M'Kenzie.

BIRTH, in a general sense. The word is of Saxon origin, and is used to denote both the act of coming into life, which is called child-birth, and the offspring or thing born, and in these senses we meet with it in our best writers.

But thou art fair, and at thy birth coming into the world.
Shakespear's King John.

Others hatch their eggs, and tend the birth, (young ones) until they are able to shift for themselves. Addison. Cicero says, "Feræ diligunt partus suos," beasts love their offspring.

BIRTH, in *Midwifery*, is used as synonymous to labour, or the power by which the fœtus is excluded from the uterus, and in this sense we say, the birth (labour) was easy, expeditious, tedious, difficult, &c. It is also, though not very properly, used by midwives, to signify the external orifice of the vagina; thus when in labour, the head of the child begins

to dilate the external orifice, or to emerge, it is said to be in the birth.

Birth, *Natural*, when the head of the fœtus presenting to the uterine orifice, the labour is completely effected by the pains, without the interference of art. See Labour, *Natural*.

Birth, *Premature*, when by any accident or derangement of the health of the woman, or of the fœtus, pains are excited, and the fœtus is expelled before it has attained its maturity. See Abortion, and also Labour, *Premature*.

Birth, *Preternatural*, or across, when, in labour, the arm, shoulder, side, breech, or any other part than the head of the fœtus present to the uterine orifice. See Labour, *Preternatural*, and Cross-*birth*.

Birth, *Laborious*, when in labour the head of the fœtus presenting, yet on account of the straightness of the pelvis, the pains are insufficient for its expulsion, whence recourse is necessarily had to the assistance of the laver, forceps, crotchet, &c. See Laborious *Birth*, or Labour.

Birth, *Monstrous*, when the fœtus is deformed or misshaped, and has more or fewer organs than is natural. See Monster.

Births, *Seven Months*, partus septimestris, children born at the end of the seventh month, or 210 days from the time of conception, being now complete in all their members, and having acquired a certain degree of strength, and firmness of constitution, are not unfrequently reared or brought up.

Births, *Eight Months*, partus octimensis, that is, children born at the end of the eighth month, or after completing 240 or 242 days in the womb. These were supposed by the ancients, but erroneously, to be less vivacious, and consequently less likely to be preserved alive, and to grow up to manhood, than seven months children. This opinion, founded on a mistaken idea of the upright position of the fœtus in utero during the former months of pregnancy, and of the necessity of its making an evolution, about the end of the seventh month, to prepare it for the birth, is considered under the article *Position of the fœtus in Utero*, which see.

For the number of births, see Marriage, under which the proportion of *births* to marriages, of *births* to burials, and of male *births* to females is computed. See also Mortality.

Birth, *After*. See Placenta.

Birth is also used for a person's descent; and it is either high or low according to the circumstances of his ancestry.

Birth, Berth, or Birthing, among *Seamen*, denotes the due distance observed between ships lying at an anchor, or under sail. A convenient place a-board for a mess to put their chests, sleep, &c. is also called a *birth*.—There is usually one of these in ships of war between every two guns. And a proper place to moor a ship in is called by the same name, as is also the station in which a ship rides at anchor. To *take a good birth*, is to remove to some distance off any point, rock, or other thing which the seamen would avoid or go clear of.

Birth, *Exposition of*, among the *Ancients*, was where a new-born infant was exposed or cast away, and left to the mercy of the first comer, who might either take and bring it up, or suffer it to perish. See Exposing of *Children*.

Birth, *Supposition of*, *partus suppositio*, in the *Civil Law*, is a crime for which accusation may be intended by those who have interest therein, and is punished with death, like the *crimen falsi*, or forgery.

Birth, *Suppression of*, *partus suppositio*. See Abortion.

Birth-*Day*, the anniversary return of the day on which a person was born. This answers to what the ancients called γενεθλιον, *genethlion*, *natalitius dies*, *natalitia*, and, in the middle age, *genetalius*. The ancients made much of their religion to consist in the celebration of birth-days, and took omens from thence of the felicity of the coming year. We meet with birth-days of the gods, emperors, great men, poets, and even private persons; and besides, the birth-days of cities, as Rome and Constantinople, were celebrated with great pomp by the inhabitants. Virgil's birth-day was held very strictly by the wits and poets who succeeded him. Pliny (Epist. lib. iii. ep. 7.) assures us, that Silius kept it with more solemnity than he did his own.

The manner of celebrating birth-days was by a splendid dress; wearing a sort of rings peculiar to that day; offering sacrifices, the men to their genius, of wine, frankincense; the women to Juno; giving suppers, and treating their friends and clients; who, in return, made them presents, wrote and sung their panegyrics, and offered vows and good wishes for the frequent happy returns of the same day. The birth-days of emperors were also celebrated with public sports, feasts, vows, and medals struck on the occasion. But the ancients, it is to be observed, had other sorts of birth-days besides the days on which they were born. The day of their adoption was always reputed as a birth-day, and celebrated accordingly.

The emperor Adrian, we are told, observed three birth-days; *viz.* the day of his nativity, of his adoption, and of his inauguration. (Fab. Bib. Græc. tom. xii. lib. vi. cap. 6.) In those times it was held, that men were not born only on those days when they first came into the world, but on those also when they arrived at their chief honours and command in the commonwealth, e. gr. the consulate. Hence that of Cicero in his oration Ad Quirites, after his return from exile: "A parentibus id quod necesse erat, parvus sum procreatus, a vobis natus sum consularis." Besides, those who returned from banishment were also considered as being born again, *renati*, and ever after called the day of their return their birth-day. Thus Cicero to Atticus: "Diemque natalem reditus mei cura ii in tuis ædibus amœnissimis agam tecum, & cum meis." Censorinus has a treatise De Die *Natali*, addressed to Q. Cerellius, as a compliment on his birth-day.

Birth-*Days of the Saints and Martyrs*, *natales sanctorum*, denote the days of their deaths.

In reality, *natalis*, among the ancients, was not restrained to birth-days, but extended to all feast-days.

Hence it is we meet with *natalis solis*, *natalis calicis*, *natalis ecclesiæ*, *natalis reliquiarum*, *&c.*

Birth-*sin*, in *Theology*, the same with *original sin*, which see.

Birth-*Wort*, in *Botany*. See Aristolochia.

BIRTHA, in *Ancient Geography*, *Tekrit*, a town of Asia, in Mesopotamia, on the Tigris, south of the confluence of the Zabus Minor with this river.—Also, a town of Arabia Deserta, seated on the Euphrates, according to Ptolemy.

BIRTHAMA, or Bithaba, a town of Asia, in Assyria, according to Ptolemy.

BIRTHIN, in *Geography*, a river of Monmouthshire, which runs into the Usk, near the town of Usk.

BIRU, a town of South America, in the empire of Peru, distant 10 leagues from Truxillo, and inhabited by about 70 families of Spaniards, Indians, Mulattoes, and Mestizos. About half a league to the north of it is a rivulet, from which are cut several trenches for watering the grounds, which of course are equally fertile with those in the vicinity of Truxillo. S. lat. 8° 24′ 59″. W. long. 69° 17′.

BIRUCKPOUR, a fortress of Hindoostan, in Malva country,

country, and circar of Chanderee; 55 miles eaſt of Chanderee.

BIRVIESCA, Bribusca, or Bribiesca, a mean and wretched town of Spain, in Old Caſtile; 15 miles N. E. of Burgos.

BIRUISA, a river of Siberia, which runs into the Tchiuna. N. lat. 57° 35′. E. long. 95° 14′.

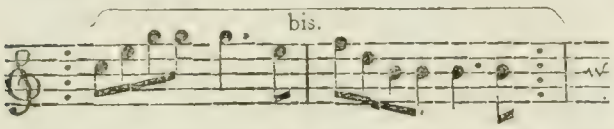
BIRUTCH, or Biruitsch, a town and diſtrict of Ruſſia, in the government of Voronetz, ſeated on the river Soſna, which falls into the Don; 50 miles ſouth of Voronetz.

BIRZA, or Birz, a town of Poland, in the palatinate of Troki. N. lat. 56°. E. long. 24° 40′.

BIS, in *Botany*, a name given by ſome old writers to the napellus, or monk's-hood, and by others to the cicuta or hemlock.

Bis, Lat. *twice*. In *Muſic*, when a paſſage which ought to be repeated, has, through miſtake, or to ſave room, been omitted, the word *bis* placed over ſuch paſſage, with dots at the beginning and end, implies that the whole is to be repeated.

Example.



Bis-*annual*, a name given by *Botaniſts* to thoſe plants which ordinarily do not flower till the ſecond year.

BISA, or Biza, a coin in Pegu, current there for half a ducat. The denomination is alſo given to a kind of weight uſed in the ſame country, equivalent to two Venetian pounds five ounces, or to three pounds nine ounces of the ſmaller weight of that city.

BISACCIO, in *Geography*, a town of Italy, in the kingdom of Naples; 12 miles N.N.E. of Conza. N. lat. 41° 3′. E. long. 15° 35′.

BISACUTA, in *Middle Age Writers*, an axe with two edges, or which cuts either way; or a miſſive weapon pointed at both ends. Walſingham repreſents the *ſecuris biſacuta* as peculiar to the Scottiſh nation. See Battle-*Axe*.

BISALTÆ, in *Ancient Geography*, the name of a people who inhabited a ſmall country bordering on the Sinus Strymonicus, in the northern part of Macedonia. Their chief cities were Euporia, Oſſa, and Calitera.

BISALTIDE, in *Entomology*, a ſpecies of Papilio (*Dan. Feſt.*) that inhabits Surinam. The wings are ſlightly tailed, fulvous, black at the tips; beneath, two ocellar dots on the anterior pair, and three on the poſterior ones. Fabricius, &c.

BISAMRAZE, in *Zoology*, *Sorex moſchatus*, Gmelin, and *long-noſed beaver of* S. G. Gmelin. it. &c.

BISAMTHIER, *Moſchus moſchiferus*, or *Thibet muſk* in Geſn. Quadr.

BISANTHE, or Rædistus, in *Ancient Geography*, a town of Thrace, on the confines of the Propontis, at the bottom of a kind of gulf, and at a ſmall diſtance S.W. from Perinthe.

BISANT. See Besant.

BISBÆA, a feaſt celebrated by the Meſſapii, after the pruning of their vines, to obtain of the gods that they might grow again the better. The word is formed from βισσὸν, uſed by ſome for a *vine*.

BISCAINO, Bartolomeo, in *Biography*, an eminent artiſt, was born at Genoa in 1632, and inſtructed in the firſt principles of painting and deſign by his father Giovanni Biſcaino, a landſcape painter of reputation. He afterwards perfected himſelf, particularly in the art of colouring, under Valerio Caſtelli. By his early death, at the age of 25 years, the expectations of thoſe who admired his talents and performances were diſappointed. Some of his etchings are executed in a bold ſtyle, reſembling thoſe of Caſtiglione, but all more finiſhed. His figures are elegant, firmly compoſed, and drawn in a very maſterly manner; he has given beauty and character to the heads; and the other extremities are peculiarly correct, and marked with great ſpirit. Some of the principal are the following: "Moſes in the ark of bulruſhes;" "A Nativity, with angels;" "The wiſe-men's offering;" "The Circumciſion of Chriſt;" and a "Bacchanalian." Strutt.

BISCARA, or Bescara, in *Geography*, a decayed city of Africa, in the kingdom of Algiers, the capital of the diſtrict of Zaab or Zeb, belonging to the province of Conſtantine. It is the reſidence of a Turkiſh garriſon, and has a ſmall caſtle, built by Haſſan, the bey of Conſtantine, and chiefly defended by ſix ſmall pieces of ordnance, and a few unwieldy muſkets, mounted on carriages. It is a place of great antiquity, built by the Romans, and deſtroyed by the Arabs, who afterwards rebuilt it. It is at preſent as indifferently peopled as it is weakly defended; the houſes being infeſted by ſwarms of ſcorpions, vipers, and poiſonous reptiles, and the inhabitants being obliged to deſert the city and retire into the country in the ſummer, when theſe noxious animals are intolerable. The inhabitants of this place, and its adjacent diſtrict, called "Biſcaris," lead a kind of wandering life, and live in tents. Few of them can be employed in agriculture and paſturage from the nature of the country; but thoſe of the ſuperior claſs carry on ſome commerce, notwithſtanding their poverty and indigence, in negroes and oſtrich feathers. The pooreſt of them migrate every year to the city of Algiers, and other towns of the kingdom, and are employed in the meaneſt and moſt ſubordinate offices, ſuch as cleanſing of ſtreets, emptying vaults, ſweeping chimnies, and carrying burdens. Having in the courſe of two or three years accumulated a capital of from ſix to ten zechins, they return home, and on account of the ſcarcity of coin among them are reckoned among the wealthy of the land. In the capital, they conſtitute a kind of corporation, and have even a common treaſury for the purpoſe of mutually relieving one another. They are the only claſs of free ſervants, and are highly eſteemed for their fidelity. In winter, as well as in ſummer, they ſleep wrapped up in rags, on a kind of benches before the ſhops, and others place themſelves at the gates of the different roads, for the convenience of opening them to paſſengers. They are not only deſerving of the confidence that is repoſed in them, but their diſpoſition is placid and obliging, and their perſeverance in labour is indefatigable. Thoſe among them who are guilty of any breach of truſt, are puniſhed by their chiefs. They are employed by the Europeans as ſervants, and as they can ſpeak, beſides the language of the country, the "lingua Francia," are found ſingularly uſeful. The villages which they inhabit in their own country are ſmall, and remarkable only for their meanneſs and poverty. N. lat. 34° 30′. E. long. 5° 15′.

BISCARGIS, or Bissangis, in *Ancient Geography*, a town of Spain, on the right ſide of the Iberus, N.W. of Dertoſa.

BISCAY, in *Geography*, a province of Spain, called, "the lordſhip of Biſcay," is, in its moſt appropriate and reſtricted ſenſe, bounded on the north by the Bay of Biſcay, on the ſouth

ſouth by a chain of the Pyrenées, which ſeparates it from Old Caſtile and Alava, on the weſt by Aſturias, and on the eaſt by Guipuſcoa; and in extent its length is about 116 miles, and breadth much leſs, the greateſt breadth being 80 miles, but very unequal. In its more general and comprehenſive ſenſe, Biſcay is divided into three parts; viz. Biſcay, properly ſo called, Guipuſcoa, and Alava; and, accordingly, it is bounded on the weſt by that narrow tract of Old Caſtile which reaches to the ſea and Aſturias; parted from Old Caſtile on the ſouth-eaſt by the ridge of the Aſturian mountains branching from the Pyrenées, and by the ſame mountains from Navarre, and by the river Cidarſo from France, on the eaſt; and waſhed on the north ſide by the Cantabrian ſea, now commonly called the bay of Biſcay. The country is for the moſt part mountainous and barren; but its vallies produce corn ſufficient for the ſupply of the inhabitants, and a ſmall quantity of flax. Apples are very plentiful, of which is made cyder, the common beverage of the people. They have alſo a weak wine, called "Chacolino," which is pleaſant, though it will not keep long, and is uſed inſtead of ſmall beer. They have alſo citrons and oranges in great abundance. The adjacent ſea ſupplies excellent fiſh, and the foreſts yield great quantities of timber for ſhipping. But the moſt valuable treaſure of this country conſiſts of its inexhauſtible mines of excellent iron, which is tranſported from hence into all parts of the world. The country has been long famous for its iron-works, and eſpecially for its manufacture of ſwords and knives. Some have computed the amount of its annual manufacture of iron and ſteel into arms, nails, iron tools, bars, &c. at 300,000 quintals. The air of this province is mild, pure, and more temperate than that of the other provinces of Spain; and the inhabitants have been diſtinguiſhed by their attachment to liberty, and reſiſtance to oppreſſion. Their anceſtors the Cantabri, were but imperfectly ſubdued by Auguſtus, and their mountains have, in every ſucceeding age, afforded them a retreat from the encroachments of arbitrary power. The Biſcayners are ſaid to be of Celtic or Gothic extract; and have preſerved more of their ancient genius, laws, government, and language than perhaps any other people in Europe, except the Welſh, Scots Highlanders, and wild Iriſh, who are probably of the ſame origin, and whoſe language much reſembles the Biſcayan. They have always maintained a diſtinguiſhed reputation for valour; and the beſt ſoldiers and ſailors of Spain have been the natives of this country. They eſſentially differ from the other Spaniards in the openneſs of their temper, and animation of their manner; and though they are choleric even to a proverb, and not deſtitute of pride and vanity, they are obliging, polite, and friendly. Their females are beautiful, lively, and cheerful. Their dreſs is neat and paſtoral; their hair falling down their backs in long plaits, with a handkerchief twiſted round it. The moſt ſingular part of the dreſs of the men is the covering of their legs, round which they wrap a piece of coarſe grey or woollen cloth, faſtening it with many folds of tape. The three provinces of Biſcay, Alava, and Guipuſcoa, have been the aſylum of liberty and induſtry, and to theſe cauſes their proſperity may be aſcribed. When the king, who is ſtyled merely "lord of Biſcay," wants a ſupply either of men or money, he announces his will to the province; which furniſhes its contingency of both; the latter being levied upon the different cities and communities, according to a certain regiſter, ſo that in effect Biſcay may be ſaid to tax itſelf. In this province are no biſhops. Its privileges, which are extenſive, it has watched over with a jealous eye. The language of Biſcay is accounted aboriginal; it is ſaid to be the Cantabrian, or ancient language of Spain, which was a branch of the Celtic, and firſt gave way to the Romanſh; which ſee. It is ſo totally different from the Caſtilian, that the peaſants ſcarcely underſtand a ſingle word of Spaniſh. The capital of Biſcay is Bilboa, which ſee. Its other chief towns are Orduna, Durango, Fontarabia, St. Sebaſtian, Toloſa, and Vittoria.

Biscay, *Bay of*, that part of the Atlantic which lies north of the province of Biſcay, between the projecting coaſts of France and Spain, and extends from Cape Ortegal to Breſt. It advances fartheſt to the land between Bayonne and St. Sebaſtian; and it likewiſe advances conſiderably at Rochelle and Rochefort.—Alſo, a large bay on the coaſt of Newfoundland, between cape Race and cape Pine. It lies in the N.E. corner of Trepaſſey bay, on the S.E. part of the iſland. N. lat. 46° 50′. W. long 53° 6′.

Biscay, *New*, a province of Mexico in North America in the audience of Guadalajara, bounded on the north by New Mexico, on the eaſt by New Leon and the river Bravo, on the ſouth by Cinaloa and Culiacan, and on the weſt by Navarre, Sonora, and Haqui, on the borders of the gulf of California. It is computed to be about 300 miles from eaſt to weſt, and 360 from north to ſouth. The country is mountainous, but well watered, fruitful, and moderately temperate, rich in corn, cattle, and other productions; and alſo in mines of ſilver and lead. The original inhabitants have four large towns in the moraſſes, which are difficult of acceſs, and by means of which they avoid total ſubjection; and therefore the Spaniards have built three ſmall fortified and well inhabited towns for the defence of their ſilver mines. The capital is Durango. This province lies between the latitudes of 27° and 33° N. and between 105° and 108° W. long.

BISCEGLIA, a town of Naples, in the province of Bari, having the ſee of a biſhop, ſuffragan of Trani; it is pleaſantly ſituated on an eminence in the midſt of orchards and villas. The walls are of ſtone and very lofty; and it has hundreds of ſubterraneous reſervoirs and ciſterns, cut in the ſolid rock, and arched over with ſtones and ſtucco, in order to collect and preſerve the rain water, which is the only ſort with which they are ſupplied in a diſtrict, ſo totally deſtitute of ſprings. Biſceglia is 4 miles diſtant from Trani.

BISCHBURG, or Bischofsburg, a town of Pruſſia, in the county of Ermeland, 54 miles ſouth of Koniggſberg.

BISCHEIM, a town of Germany, in the circle of the Upper Rhine, and county of Litchtenberg, on a ſmall river which runs into the Rhine, 8 miles N.E. of Straſburg.

BISCHOFFLACK, or Schofia Koloka, a town of Germany, in the duchy of Carniola, 27 miles N.N.E. of Trieſte.

BISCHOFFSHEIM, a town of Germany ſeated on the Tauber, in the circle of Franconia, but belonging to the electorate of Mentz; 64 miles S. E. of Mentz.

BISCHOFFSTORF, a town of Germany, in the duchy of Stiria, 13 miles E.N.E. of Gratz.

BISCHOFSHEIM, a town of Germany, in the circle of Franconia, and biſhopric of Wurzburg, ſeated on the Rhom, 32 miles north of Wurzburg.—Alſo, a town of Germany, in the circle of the Upper Rhine, and county of Hanau-Munzenburg, 3 miles W.N.W. of Hanau.

BISCHOFSTEIN, or Bistein, a town of Pruſſia, in the county of Ermeland, 42 miles ſouth of Koningſberg.

BISCHOFSWERDA, a town of Germany, in the circle of Upper Saxony, and margraviate of Meiſſen, ſeated on an

an island in the river Wesenitz, the principal commerce of which is in white thread; it has two churches; 20 miles east of Dresden.

BISCHOFSWERDER, a town of Prussia, in the province of Oberland, 80 miles S.S.W. of Konigsberg.

BISCHOFZELL, a town of Swisserland, in the Thurgaw, seated at the confluence of the rivers Sitter and Thur, 11 miles south of Constance. This town has a castle, in which resides the bailiff of the bishop of Constance, who exercises jurisdiction over the Catholics, and receives a moiety of the fines. N. lat. 47° 25′. E. long. 9° 13′.

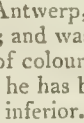
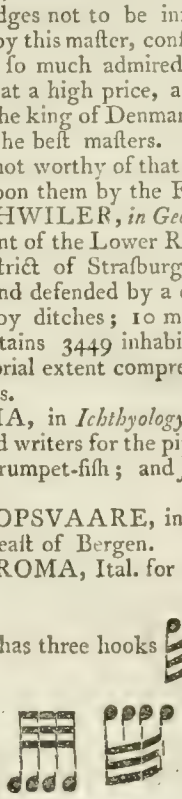
BISCHOP, or Biskop, John de, in *Biography*, an excellent artist, was born at the Hague in 1646, and is much commended as a painter; and his drawings, in which he imitated with great exactness the style of the best masters, are much esteemed and sought after by the curious. But he is most generally known as an engraver. His works are chiefly etchings, harmonized with the graver; and though slight, yet free, spirited, and pleasing. He gives a richness to the colour, and a roundness to the figures, far beyond what is usually done with the point, so little assisted by the graver. His figures are generally well drawn, more in a mannered than a correct style; but his extremities are not always well marked, nor his heads equally expressive and beautiful. His excellence was owing chiefly to his own genius, as he never studied under any master. He worked chiefly at Amsterdam, and died in 1686. The following prints are worthy of notice: viz. "Christ and the Samaritan woman" from Annibale Caracci; "Joseph distributing corn to the Egyptians," from B. Breenberge; "the Martyrdom of St. Laurence," from the same. Strutt.

Bischop, or Biskop, Cornelius, a painter of portrait and history, was born at Antwerp, say some, or according to others, at Dort, in 1630; and was the disciple of Ferdinand Bol, whose pencil, tint of colouring, style, and manner, he resembled, and to whom he has been thought by some competent judges not to be inferior. He died in 1674. A painting by this master, consisting of a few figures by candle-light was so much admired by Louis XIV., that he purchased it at a high price, and placed it in the royal collection. The king of Denmark also admitted his works among those of the best masters. It is observed, however, that they are not worthy of that high commendation which is bestowed upon them by the Flemish writers. Pilkington.

BISCHWILER, *in Geography*, a town of France, in the department of the Lower Rhine, and chief place of a canton in the district of Strasburg, seated on the Motte near the Rhine, and defended by a castle, flanked with towers, and guarded by ditches; 10 miles north of Strasburg. The town contains 3449 inhabitants, and the canton 13,968. Its territorial extent comprehends 265 kiliometres, and 21 communes.

BISCIA, in *Ichthyology*, one of the synonymous names among old writers for the pipe-fish, tobacco-pipe-fish, needle-fish, or trumpet-fish; and *syngnathus acus* of Linnæus and Gmelin.

BISCOPSVAARE, in *Geography*, a town of Norway; 48 miles east of Bergen.

BISCROMA, Ital. for a demisemiquaver, in *Music*. If single, it has three hooks  ; if two or more, they have three ties  . See Time-table.

BISCUIT. See Biskèt.

Biscuit, in *Pottery*, a name given to porcelain, when baked and not glazed; and this is more or less beautiful, according to the nature of its composition. See Porcelain and Pottery.

BISCUTA, in *Entomology*, a species of Formica, with a bidentated thorax; and a double petiole scale. Inhabits Cayenne. Fabricius Spec. Inf.

BISCUTELLA, formed of *bis*, and the diminutive of *scutum*, the fruit resembling a double shield, in *Botany*, *Buckler-mustard*, or *bastard Mithridate mustard*. Linn. gen. 808. Reich. 872. Schreb. 1084. Juss. 239. Gærtn. t. 141. Thlaspidium. Tournef. 101. Class and order, *Tetradynamia Siliculosa*. Nat. Ord. *Siliquosæ, cruciformes*, or *cruciferæ*. Gen. Char. *Cal.* perianth four-leaved; leaflets ovate, acuminate, gibbous at the base, coloured, deciduous. *Cor.* four-petalled, cruciform; petals oblong, obtuse, spreading. *Stam.* filaments six, the length of the tube of the corolla; two opposite shorter; anthers simple. *Pist.* germ compressed, orbiculate, emarginate; style simple, permanent; stigma obtuse. *Per.* silicle erect, compressed, flat, semibifid, with roundish lobes, two-celled; partition lanceolate, ending in a rigid style; cells two-valved, affixed to the partition on its straight margin. *Seeds* solitary, roundish, compressed, in the middle of the cell. *Obs.* The two outer leaflets of the calyx in some species have a tubular-concave melliferous prominent base.

Ess. Char. *Silicle* compressed, flat, rounded above, and below two-lobed. *Cal.* leaflets gibbous at the base.

Species, 1. B. *auriculata*, ear-podded buckler-mustard. Thlaspi. Bauh. pin. 107. n. 3. prodr. 49. n. 8. Raii hist. 837. n. 4. Leucoium montanum fl. pedato. Col. ecphr. 2. 59. t. 61. Jondraba Barr. ic. 230. "Calyxes gibbous on each side with the nectary, silicles running into the style." In a wild state this plant rises about a foot in height, but in gardens nearly two feet, dividing into several branches; the flowers are produced at the ends of the branches, in loose panicles, and are of a pale yellow colour. The nectarious gland is very large, and the calyx bagged out very much at the bottom. A native of the south of France and Italy. Cultivated in Kew garden by Mr. J. Sutherland in 1683, and flowering in June and July. 2. B. *apula*, spear-leaved buckler-mustard. B. didyma. Lin. spec. 911. Hort. Cliff. 329. 2. Upsf. 185. Thlaspi. Raii hist. 837. n. 3. Clypeatum. Clus. Hist. 2. 133. Jondraba. Col. ecphr. 1. 283. t. 285. f. 1. "Silicles scabrous; leaves lanceolate, sessile, serrate." A native of Italy. Cultivated in 1759, by Mr. Miller. Flowering in June and July. 3. B. *lyrata*. Thlaspi biscutatum, &c. Bocc. sic. 45. t. 23. Raii hist. 837. n. 6. "Silicles scabrous; leaves lyrate." A native of Spain and Sicily. 4. B. *coronopifolia*. "Silicles smooth; leaves toothed, rough with hairs." Allioni thinks this a variety of the second, proceeding from a dryness of soil; for it is found in very dry barren places in Spain, Italy, and Germany. Gouan is of opinion that this and the second, third, and fourth are one species. 5. B. *lævigata*, smooth buckler-mustard. B. didyma. Scop. Carn. n. 804. Clypeola didyma. Crantz. Austr. 20. Leucoium. Col. ecphr. 1. 283. t. 285. f. 2. Raii hist. 836. n. 2. "Silicles smooth; leaves lanceolate, serrate." The whole plant is acrid; the root perennial, according to Jacquin, but, according to others, annual. A native of Italy and Austria. Found at very different heights in the mountains, with variation of stature, from half a foot to a foot and a half. Flowering in lower situations in April and May; in higher ones in July and August; in our gardens in June and July. Introduced here in 1777 by M. Thouin. 6. B. *sempervirens*, shrubby buckler-mustard.

muſtard. Thlaſpi biſcutellatum, &c. Bar. ic. t. 841. Bocc. muſ. 197. t. 122. "Silicles ſomewhat ſcabrous; leaves lanceolate tomentoſe." A native of Spain. Introduced into Kew garden in 1784, by Meſſrs. Lee and Kennedy.

Propagation and Culture. Theſe are all annual plants, except the laſt, and periſh ſoon after they have perfected their ſeeds. They ſhould be ſown in ſpring or autumn, upon a border of light earth, in an open ſituation, where they are to remain. Thoſe ſown in autumn will come up about three weeks, live through the winter, and flower early in the following ſummer, and thus good ſeeds may be always obtained; but thoſe that are ſown in the ſpring decay in bad ſeaſons before the ſeeds are ripe. The autumnal plants flower in June, and the ſpring plants in July, and their ſeeds ripen in about ſix weeks, and if they are permitted to ſcatter, young plants will be produced without any care. They require only to be kept free from weeds, and to be thinned where they are too cloſe, leaving them eight or nine inches aſunder. They have no great beauty to recommend them. Martyn's Miller.

BISDORF, in *Geography*, a town of Germany, in the circle of Upper Saxony, and principality of Anhalt-Cothen, 3 miles north of Cothen.

BISECTION. See Bissection.

BISELLIARII, or Biselliari, in *Antiquity*, thoſe who enjoyed the honour or privilege of the biſellium.

The word occurs in ancient inſcriptions. Cn. Plaetorio Viviro Auguſtali Biselliario. Gruter. Inſcr. p. 1099.

The *honor biſellii* appears to have been much the ſame with what in France is called *droit de fauteuil;* and the biſelliarii thoſe who in public aſſemblies enjoy this diſtinction of the *fauteuil*, while other perſons are obliged to ſtand, or ſit on benches, ſtools, or ordinary chairs. Scaliger, in his index to Gruter, miſtook the biſelliarii for artificers who made theſe ſeats.

BISELLIUM, from *bis* and *ſella, a chair*, a kind of ſeat or chair, larger and richer than ordinary, big enough to hold two perſons, wherein to ſit in courts, theatres, and other public aſſemblies.

BISEPTEMGUTTATA, in *Entomology*, a ſpecies of Coccinella, of a pale yellow colour, with fourteen white ſpots. Schaller. Country unknown.

BIS-ERGOT, in *Ornithology*, a name given by Buffon to the Gmelinian *tetrao bicalcaratus*.

BISERRULA, ſo named from the fruit "biſerrato fructu," in *Botany*. Lin. Gen. 893. Reich. 966. Schreb. 1209. Juſſ. 358. Gærtn. t. 154. Pelecinus, Tournef. 234. Claſs and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ* or *leguminoſæ*. Gen. Char. *Cal.* perianth, one-leaved, tubular, erect, ſemiquinquefid; teeth ſubulate, equal, the two upper ones more remote. *Cor.* papilionaceous; banner larger, reflected on the ſides, aſcending, roundiſh; wings ovate-oblong, free, ſhorter than the banner; keel the length of the wings, obtuſe, aſcending. *Stam.* filaments diadelphous (ſimple and nine-cleft), aſcending at their tips, incloſed within the keel; anthers ſmall. *Piſt.* germ. oblong, compreſſed; ſtyle tubulate, aſcending; ſtigma ſimple. *Per.* legume large, linear, flat, two-celled; partition contrary to the valves. *Seeds* very many, kidney-form, compreſſed.

Eſſ. Char. legume two-celled, flat; partition contrary.

Species. 1. B. *Pelecinus*, baſtard hatchet-vetch. Aſtragalus. Mor. hiſt. 2. 107. f. 2. t. 9, f. 6. Securidaca. Bauh. Pin. 349. 3. Cluſ. hiſt. 2. 238. Ger. emac. 1234. f. 6. Park. Theatr. 1089. f. 5. Raii hiſt. 939, n. 16. Lunaria radiata Robini. Bauh. hiſt. 2. 348. f. 2. An annual plant growing naturally in Italy, Sicily, Spain, and the ſouth of France. Cultivated in Kew garden in 1640.

Propagation and Culture. It is propagated by ſeeds, ſown in this country in autumn, on a bed of light earth, where the plants will come up in about three weeks, and live wel in the open air. They ſhould either be ſown where they are to remain, or tranſplanted when very young. After the plants are come up, they will only require to be kept free from weeds, and to be thinned to the diſtance of a foot from one another. They flower in June, and the ſeeds ripen in September. They may be alſo ſown in ſpring, and treated in the ſame manner. Two or three of theſe plants may be cultivated for the ſake of variety, but they have not much beauty. Martyn's Miller.

BISERT, in *Geography*, a town of Ruſſia, ſeated on a ſmall river which runs into the Upha, in the government of Perm, 80 miles S. E. of Perm.

BISERTA, or Bizerta, a ſea-port town of Africa, in the kingdom of Tunis, pleaſantly ſituated upon a canal betwixt an extenſive lake and the ſea, at the bottom of a large gulf, about 8 miles to the ſouthward of Cape Blanco. N. lat. 37° 5'. E. long. 10° 15'. It is about a mile in circuit, defended by ſeveral caſtles and batteries, the principal of which are towards the ſea. Bizerta is a corruption of the "Hippo-Diarrhytus" or "Zaritus" of the ancients; though the preſent inhabitants derive its name from their own language, and ſuppoſe it to be the ſame with "Benſhertd," i. e. the offſpring of a canal or rivulet. The lake upon which Bizerta is ſeated has an open communication with the ſea; and, according to an obſervation of the younger Pliny (Ep. xxxiii. l. 9.), is either continually receiving a freſh ſtream from the ſea, or elſe diſcharging one into it; ſo that the water loſt by the lake by exhalations is ſoon ſupplied by the ſea, which in hot ſeaſons runs into it with a very briſk current, in order to maintain the equilibrium, in the ſame manner as is obſerved between the Atlantic ocean and the Mediterranean. The mullets of this lake are reckoned the beſt in Barbary. Great quantities of their roes are dried and made into "Botargo," and ſent from hence to the Levant, where they are eſteemed a great dainty. The channel of communication betwixt the lake and the ſea is the port of "Hippo-Diarrhytus," which ſtill receives ſmall veſſels; though it muſt have been formerly the ſafeſt as well as the moſt beautiful haven of this part of Africa. There are ſtill remaining the traces of a large pier, that was carried out into the ſea, to break off the N. E. winds; the want of which, together with the diſinclination of the Turks to repair it, will in a ſhort time make the haven uſeleſs, which, in any other country, would be ineſtimable. Scylax calls it only "Hippo," and Diodorus Siculus gives it the name of "Hippouacra." By the direction of Scipio's marches it ſeems to have been the rich anonymous town mentioned by Livy (l. xxix. 28.) If the Turks encouraged trade and induſtry it would deſerve this appellation, becauſe, beſides fiſh and fruit of all kinds, it abounds with corn, pulſe, oil, cotton, and a variety of other valuable productions. The gulph of Bizerta, the "Sinus Hipponenſis" of the ancients, is a beautiful ſandy inlet, nearly four leagues in breadth. As its bottom is low, it affords a delightful proſpect through a variety of groves and plantations of olive trees, to a great diſtance into the country; but to the eaſtward the view is bounded by a high rocky ſhore, extending as far as cape Zibeeb. Bizerta was formerly a large town, and is ſaid to have contained 6000 houſes; whereas now the town, and its dependent villages, ſcarcely contain the ſame number of inhabitants. It has, nevertheleſs, two capacious priſons for ſlaves, a large

magazine for merchandiſe, and two towers, with ſome other out-works to defend the entrance of the haven. It is well ſupplied with freſh water from the ſurrounding ſprings, and with great variety of fiſh from the adjacent lake. Moſt of the inhabitants are employed in the fiſhing-trade, which begins about the end of October, and ends in the beginning of May. The people are poor, and reckoned proud, ill-natured, and treacherous; inſomuch that Muley Haſun Bey, one of their ſovereigns, uſed to ſay of them, that neither fear nor love could keep them faithful. Bizerta has eight villages under its government, a large plain called "Mater," and the territory of Choros, the "Clypea" or "Corobis" of the ancients, which is extenſive, and inhabited by a number of perſons who are poor, meanly clad, and coarſely fed. Their dreſs conſiſts merely of a piece of coarſe cloth wrapped round their bodies, and another, in the form of a turban, round their heads; and moſt of them are without covering either to their feet or legs. Thoſe of the poorer claſs ſleep on ſkins laid on the floor; and the rich lie in narrow couches fixed againſt the wall, about five or ſix feet high, to which they aſcend by a ladder. Their choiceſt dainty is their "couſcou," made of flour, eggs, and ſalt, which they dry and keep through the year. They are expert horſemen, and ride without either ſaddle or bridle; nor do they ever ſhoe their horſes. They are much expoſed to the depredations and oppreſſions of the neighbouring Arabs. The Biſertines, both of the city and country, are very ſuperſtitious, and hang about their own necks, and thoſe of their horſes, a number of amulets, which are ſcraps of paper or parchment, on which ſtrange characters are inſcribed, and ſewn up in a piece of leather, ſilk, &c. and thought, when worn about their perſons, to be a preſervative againſt all accidents.

BISET, Charles Emanuel, in *Biography*, a painter, of hiſtory and converſations, was born at Mechlin, in 1633; and in his early productions manifeſted a lively and ready invention. He was diſtinguiſhed by the multitude of figures which he introduced into his deſigns, and by his variety of drapery, peculiar to every nation. At a diſtance, his pictures, which conſiſted chiefly of balls, concerts, and gay aſſemblies, correctly deſigned and well-coloured, had a ſtrong effect; but more nearly inſpected, they ſhewed a neatneſs of pencil, a ſpirited touch, and a good expreſſion. Pilkington.

Biset, in *Ornithology*, *Columba livia*, or ſtock dove, in Buffon's Hiſt. Birds.

BISHOP, in *Eccleſiaſtical Hiſtory*, a prelate, or perſon conſecrated for the ſpiritual government and direction of a dioceſe. The word comes from the Saxon *biſchop*, and that from the Greek επισκοπος, an *overſeer* or *inſpector*; which was a title the Athenians gave to thoſe whom they ſent into the provinces ſubject to them, to ſee whether every thing was kept in order; and the Romans gave the ſame title to thoſe who were inſpectors and viſitors of the bread and proviſion. It appears from a letter of Cicero, that he himſelf had a biſhopric; being "epiſcopus Oræ et Campaniæ."

A biſhop differs from an archbiſhop in this, that an archbiſhop with biſhops conſecrates a biſhop, as a biſhop with prieſts ordains a prieſt: that the archbiſhop viſits a province, as the biſhop a dioceſe; that the archbiſhop convocates a provincial ſynod, as the biſhop a dioceſan one; and that the archbiſhop has canonical authority over all the biſhops of his province, as the biſhop over the prieſts in his dioceſe. It is a long time ſince biſhops have been diſtinguiſhed from mere prieſts or preſbyters; but whether that diſtinction be of divine or human right, whether it was ſettled in the apoſtolical age, or introduced afterwards, is much controverted. Thoſe who are advocates for the divine right of epiſcopacy, and who trace its inſtitution to the times of the apoſtles, maintain that, in the earlieſt age of the Chriſtian church, there were three different orders of miniſters appointed by the apoſtles for the diſcharge of the public offices of religion; *viz.* biſhops, prieſts, or preſbyters, and deacons. In proof of this point they refer us to the teſtimony of ancient eccleſiaſtical writers, whence they deduce, as they conceive, the moſt ſatisfactory evidence, that biſhops were inſtituted by the apoſtles, and that they continued afterwards as a diſtinct order from that of prieſts. To this purpoſe they allege, that Irenæus, a father of the ſecond century, ſays (l. iii. c. 3.), "We are able to enumerate thoſe who by the apoſtles were made biſhops in the ſeveral churches, and their ſucceſſors, to this time." He adds, "Polycarp was not only inſtructed by the apoſtles, and acquainted with many of thoſe who ſaw our Lord, but was alſo by the apoſtles made biſhop of the church of Smyrna in Aſia." Tertullian alſo, a writer of the ſame century (De Præſcr. adv. Heræt. p. 78.), challenges certain heretics to "exhibit the order of their biſhops, ſo ſucceeding each other from the beginning, that the firſt biſhop had for his author and predeceſſor ſome one of the apoſtles, or of thoſe apoſtolical men who perſevered with the apoſtles; for in this manner apoſtolical churches aſſert their rights: thus, the church of Smyrna has Polycarp, who was placed there by John; the church of Rome has Clement, who was ordained by Peter; and other churches ſhew other perſons, who, by being placed in the biſhoprics by the apoſtles, tranſmitted the apoſtolical ſeed." Cyprian alſo ſays (Ep. 69. ad Flor.), "that the biſhop, who is one and preſides over the church, through the proud preſumption of certain perſons, is deſpiſed; and thus the man, who is honoured by the ſanction of God, is judged unworthy by men." In an epiſtle aſcribed to Ignatius (Ad Antioch, c. 7.); but probably ſpurious, though very ancient, it is aſſerted, that Evodius was conſecrated a biſhop by the apoſtles. And Chryſoſtom ſays (Hom. 42. in Ignat.), "that Ignatius converſed familiarly with the apoſtles, and was perfectly acquainted with their doctrine, and had the hands of apoſtles laid upon him." In a fragment of an epiſtle of Dionyſius biſhop of Corinth in the ſecond century, preſerved by Euſebius, (H. E. l. 4. c. 23.), it is ſaid, that Dionyſius the Areopagite, who was converted by St. Paul, was appointed the firſt biſhop of Athens. Euſebius and Socrates have given us the catalogues of the biſhops of many cities, from the times of the apoſtles; and Epiphanius (lib. 2. Hær. 66.) has left us a catalogue of the biſhops of Jeruſalem, from St. James the apoſtle to Hilarion, who was biſhop in his time. It is further alleged, that biſhops, prieſts, and deacons, are mentioned together as three ſeparate orders. Ignatius, in his Epiſtle to the Magneſians (§ 2.), mentions Damas as biſhop of Magneſia, Baſſus and Apollonius as preſbyters, and Sotian as deacon, in the ſame church; and in his epiſtle to the Philadelphians (§ 7.), he ſays, "Attend to the biſhop, to the preſbytery, and to the deacons;" and in his epiſtle to the Trallians (§ 2.), he ſays, "Be ye ſubject to the biſhop, as to Jeſus Chriſt; to the preſbyters, as the apoſtles of Jeſus Chriſt; and to the deacons, as to miniſters of the myſteries of Jeſus Chriſt;" he then adds, (§ 3.), "without theſe there is no elect church, no congregation of holy men." The authority of Ignatius, who lived in the beginning of the ſecond century, is conſidered as deciſive. Clement of Alexandria, in the ſubſequent part of the ſame century, ſpeaks of the three progreſſive orders of deacons, prieſts, and biſhops (Strom. l. 6.); and there are ſeveral early inſtances of biſhops, who had been preſbyters and deacons in the ſame church. Irenæus was firſt preſbyter, then biſhop

bishop of Lyons; Dionysius first presbyter, then bishop of Rome; and Eleutherius, first deacon, then bishop of Rome; and all these three lived in the second century. "When your captains," says Tertullian (De Fugâ in Pers.), "that is to say, the deacons, presbyters, and bishops fly, who shall teach the laity that they must be constant?" And upon another occasion, speaking of baptism, he says (De Baptism. c. 17.), "the high-priest, who is the bishop, has the chief right of administering it, then the presbyters and deacons, but not without the authority of the bishop." Origen, in many places, speaks of bishops as superior to presbyters and deacons; and many authors compare the bishops, called by the Greeks ἀρχιερεῖς, and by the Latin fathers "summi sacerdotes," and "principes sacerdotum," presbyters and deacons of the Christian church to the high-priest, priests, and Levites under the Jewish dispensation; and hence presbyters afterwards obtained the name of priests. Clement, a disciple of the apostle, says (Ep. ad Cor. § 40.), "To the high-priest are given his proper duties; to the priests their proper place is assigned; and to the Levites their proper services are appointed;" in which passage this ancient father is speaking of the bishop, presbyters, and deacons of the Christian church; and Tertullian, in the passage just cited, called the bishop the high priest. Jerome, though he is sometimes represented as unfavourable to the cause of episcopacy, is still more express, and denominates (Epist. ad Evag.) the order of bishops, priests, and deacons, an apostolical tradition. "To what purpose," says Optatus (lib. i.), "should I mention deacons, who are in the third, and presbyters who are in the second degree of priesthood, when the very heads and princes of all, even certain of the bishops themselves, were content to redeem life with the loss of heaven?" In the tenth canon of the council of Sardis, held A. D. 347, it is enjoined that a person should not be rashly and lightly appointed a bishop, a priest, or a deacon. It is further pleaded, that episcopal power was not called in question in the three first centuries; but towards the end of the fourth century, Aerius, an Arian, wrote against it, and maintained that there ought to be no order in the church superior to that of presbyters. Nevertheless, it is alleged that no advocate is found for his opinion in the centuries immediately following; and that even Aerius allowed there had been bishops in the Christian church from the earliest period. From these several testimonies it is inferred, that bishops were appointed by the apostles; that there were three distinct orders of ministers, viz. bishops, priests and deacons, in the primitive church; and that there has been a regular succession of bishops from the apostolic age to the present time; and the enemies of episcopacy are challenged to produce evidence of the existence of a single ancient independent church fairly established, which was not governed by a bishop. While the apostles lived, the churches, it is said, were subject to their authority and government; and to this circumstance it is owing that little is said concerning the distinction and power of ministers, in the Acts and Epistles; but when the gospel was spread into distant parts, and the apostles were under a necessity of discontinuing their visits, or rendering them less frequent, they found it expedient for the better government of the Christians, and in order to put a stop to their schisms and contentions, which began to make their appearance both among the presbyters and their congregations, to place the supreme authority in one person, who, from the superintending care which he was to exercise, was called Ἐπίσκοπος, a bishop; and this word, which was perhaps at first applied indiscriminately to all who had any spiritual office in the church, was now conferred on him who was its chief governor.

The bishops were at first appointed by the apostles, and afterwards chosen by the presbyters and the congregations at large; and in both cases they were generally taken from the presbyters of the respective churches, except in those instances in which they were the immediate companions of the apostles. Accordingly Jerome, (De Eccles. Script.) where he is speaking, as it is supposed, of the apostolical times in which James was made bishop of Jerusalem by the apostles; Timothy bishop of Ephesus, and Titus bishop of Crete, by St. Paul; and Polycarp bishop of Smyrna, by St. John; observes that "churches were governed by the common advice of presbyters; but when every one began to reckon those whom himself had baptized, his own, and not Christ's, it was decreed in the whole world, that one, chosen out of the presbyters, should be placed over the rest, to whom all care of the church should belong, and so the seeds of schism should be removed." When St. Paul was at Miletus, A.D. 58, and convened the elders of the church at Ephesus, no mention is made of the bishop; and in his address to them he calls them "bishops or overseers of the flock;" hence it is inferred, that the word bishop was not then the appropriate name of the person who held the first office in the church, or rather, that there was as yet no such person in the church at Ephesus. But in the year 64, St. Paul found it necessary to place Timothy in that situation, with power to prevent the preaching of any unsound doctrine, and to ordain and exercise authority over presbyters, that is, with episcopal power; and in his epistle, written to him in that year, he speaks expressly of the "office of a bishop," and gives a detailed account of the qualifications of a bishop. See 1 Tim. i. 3. v. 1. 19. 22. 1 Tim. iii. 1. We have also a similar account in the epistle to Titus, written in the same year; and he was invested with the further power of rejecting heretics from the churches over which he presided. See Titus iii. 10. Hence it is concluded, that in the year 64 there was such an office as that of bishop. St. Paul, addressing his epistle to the Philippians, used the word bishops in the plural number, and does not mention presbyters; whence it is thought by Chrysostom, Theodoret, Jerome, and indeed by almost all commentators, that by bishops we are here to understand presbyters; and it is therefore presumed, that there was then no bishop, in the strict sense of the appellation, at Philippi. A.D. 62. From a comparison of these different passages it has been conjectured, that Paul began to establish episcopacy immediately after his release from his first confinement at Rome. However, it is acknowledged, that at this early period there was not a bishop in every church. Nevertheless, it is inferred from St. Paul's epistles, that he gave the ministers of the churches which he founded, a certain power over their respective congregations, and as St. Paul and the twelve apostles acted equally under the influence of the Holy Ghost, it is presumed that they invested all, whom they appointed to preach the gospel, with a similar degree of power; and thus church authority is derived from the apostles themselves. This power, thus originally given, was not limited to the primitive ages; it is supposed to have been transmitted to those "faithful men who shall be able to teach others also" (2 Tim. ii. 2.), and to remain in the church under different modifications, as essentially necessary for the purposes specified by the apostle, Ephes. iv. 13, 14.

At first the jurisdiction of a bishop was confined to the walls of his own city; but afterwards, when the gospel made its way into towns and villages, the concerns of the Christians that inhabited them, would naturally fall under the cognizance and direction of the bishops of the neighbouring cities; and thus dioceses would be gradually formed. See DIOCESE. In process of time, it is supposed, the affairs of the church would require the consultation and co-ope-

co-operation of different bishops; and therefore, as before, one of the presbyters of a city was raised to be a bishop, and to have authority over other presbyters, so one of the bishops of a province was selected and invested with certain authority over other bishops, and he was called an archbishop; and in the appointment of archbishops, the civil importance of the city seems to have been regarded, for we find the metropolitan bishops were generally archbishops, and hence archbishops wers called metropolitans. Archbishops, it has been said, were first appointed in the second century; and they had power to assemble the bishops within their respective provinces, to regulate the election of bishops, to consecrate them, to hear appeals from their decisions, and to take cognizance of their general conduct. See ARCHBISHOP and PATRIARCH.

It is sometimes urged, that bishops, priests, and deacons, are now, in their office and authority, very different from what they formerly were; but this, say the advocates of episcopacy, is no more than a necessary consequence of a change of times and circumstances. They do not contend that the bishops, priests, and deacons of England are at present precisely the same that bishops, presbyters, and deacons, were in Asia Minor, 1700 years ago. They maintain, however, that there have been always bishops, priests, and deacons in the Christian church, since the days of the apostles, with different powers and functions in different countries and at different periods; but the general principles and duties, which have respectively characterized these clerical orders, have been essentially the same at all times and in all places; and the variations which they have undergone, have only been such as have ever belonged to all persons in public situations, whether civil or ecclesiastical, and which are, indeed, inseparable from every thing in which mankind are concerned in this transitory and fluctuating world. A learned prelate, who flatters himself that, by the testimonies and arguments, of which we have above given a general account, he has proved episcopacy to be an apostolical institution, readily acknowledges, however, that there is no precept in the New Testament, which commands that every church should be governed by bishops. As it has not pleased the Almighty to prescribe any particular form of civil government for the security of temporal comforts to his rational creatures; so neither has he prescribed any particular form of ecclesiastical policy as absolutely necessary to the attainment of eternal happiness. And though the Scriptures contain no directions concerning the establishment of a power by which ministers are to be admitted to their sacred office, yet he conceives, that from the apostles, episcopal ordination has been regularly conveyed to us; and the legislature of this kingdom has recognized and confirmed this power to bishops. See ORDINATION. Elements of Christian Theology, by lord bishop of Lincoln, vol. ii. p. 376—401.

Persons, on the other hand, who do not admit episcopacy to be of apostolic and divine institution, contend, that the terms επισκοπος and πρεσβυτερος, that is, bishop and presbyter, are used promiscuously in the New Testament, to which they think it necessary to appeal, as to the sole authoritative rule of faith and practice, and that they denote the same, and not a distinct order or office in the Christian church. To this purpose they allege the passage already cited, Acts xx. 17. 28. in which the same persons are denominated presbyters and bishops. Thus also the name, office, and work of a bishop and presbyter appear to be the same, in Titus i. 5. 7.; and unless the apostle be charged with arguing very incoherently, he must mean the same thing by elder, v. 5., and bishop, v. 7. In like manner, presbyters are exhorted (1 Pet. v. 1, 2.) to discharge the office of bishops. The word επισκοπος, it is said, was properly the name of office, and πρεσβυτερος was a title of respect, borrowed from the Jewish custom, which was analogous to that of other nations, of calling not only the members of the Sanhedrim πρεσβυτεροι, elders or senators, but also the members of the city council. It has been moreover affirmed, that not a single passage from the apostolical writings has yet been produced, in which it appears from the context, that the two terms πρεσβυτερος and επισκοπος mean different offices; and that there is the strongest positive evidence, which the nature of the thing can admit, that in these writings the two terms uniformly mean the same office. The apostle Paul, in the directions he gave to Timothy, about the proper supply of churches with suitable ministers, takes particular notice, merely, of two orders, one called bishops, and the other deacons; and hence, it is argued, that if by bishops be meant, what in modern style is so denominated, those who have the charge of many presbyters, it is astonishing that he should not think it of importance to give any directions about the qualifications of presbyters, whilst he is particular in specifying the qualifications of deacons, who were to occupy an order allowed to be much inferior to the other; and if he here means by bishops only presbyters, as some friends of episcopacy have supposed, it is strange that an office so important as that of bishops, if it was a different and superior office, should have been entirely overlooked. From St. Paul's address to the Philippians, ch. i. 1. it is inferred, that there were but two orders then established, viz. bishops, i. e. ordinary pastors or presbyters, and deacons. If there was a bishop in the modern sense at Philippi, when the apostle wrote that letter, it seems strange that the chief person in the society should be the only person disregarded by the apostle. Moreover, in the epistle written by Polycarp to the same society, about 60 years after this time, we find mention of only these two orders, the presbyters and the deacons; nor is it of any consequence whether we call their pastors bishops with the apostle, or presbyters with Polycarp, as both speak of two orders only among them. In the whole book of Acts, the stated pastors of the churches are denominated presbyters; the collection for the poor Christians is sent to the presbyters; nor do we find a single hint of any different classes of presbyters. The appellation επισκοποι, bishops, occurs but once, and in the passage where it is applied to those that are denominated presbyters. It is urged further, that the imposition of hands, which has been considered by many as a necessary attendant on ordination, is attributed in 1 Tim. iv. 14. to the presbytery; Paul and Barnabas were ordained by certain prophets and teachers in the church of Antioch, and not by any bishop, of whom there is not a word in that whole solemnity, presiding in that city, Acts xiii. 1, 2, 3; and it is alleged, as an acknowledged and incontestible fact, that presbyters, in the church of Alexandria, ordained even their own bishops for more than 200 years in the earliest ages of Christianity. It appears also, from the first epistle of Clemens Romanus to the Corinthians, chap. xlii. that there were two distinct orders, viz. bishops and deacons, established by the apostles in the church; and by bishops he means the same with those who, in the book of Acts, are called πρεσβυτεροι, presbyters, or ordinary teachers. Since it must therefore be admitted, that in the New Testament, and also in this work of Clement, the words επισκοπος and πρεσβυτερος are, not occasionally, but uniformly, used synonymously, the discovery that there was not any distinctive appellation for such an office as that now called bishop, is adduced as affording a strong presumption, that it did not exist. Another testimony alleged to the same purpose is that

that of Polycarp, who takes notice only of two orders of miniſters in the church; for in ch. v. of his epiſtle to the Philippians, he enjoins the people to be ſubject to their preſbyters and deacons, as to God and Chriſt; hence it is inferred, that if this ancient father had known of any higher order in the church, ſuch as was that of a biſhop in leſs than 150 years after his time, he would have been the principal, if not the only perſon, to whom their ſubjection would have been enjoined by a Chriſtian writer. It is obſerved further, that though he ſpecifies the duties and qualifications of deacons in ch. v. and thoſe of preſbyters in ch. vi. and through the whole of the epiſtle, thoſe of the people, he no where mentions what is proper in the character and conduct of a biſhop. Upon the whole, it ſeems evident that Polycarp knew of no Chriſtian miniſter ſuperior to the preſbyters.

It has been alleged by the advocates of epiſcopacy, that the biſhops are the proper ſucceſſors of the apoſtles, not in the general character of teachers, but in their ſpecial function as apoſtles (ſee Stillingfleet's works, vol. i. p. 371.); whilſt the preſbyters and deacons were merely the ſucceſſors of thoſe who were, in the beginning, ordained by the apoſtles. But that the apoſtles could not have any proper ſucceſſors has been evinced by the following conſiderations. The indiſpenſible requiſite in the character of an apoſtle, which was that of having ſeen Jeſus Chriſt after his reſurrection, demonſtrates that their office could be but temporary. Beſides, they were diſtinguiſhed by prerogatives, which did not deſcend to any after them; of this kind were their having received their miſſion immediately from Chriſt, and not by any human ordination or appointment; the power of conferring miraculous gifts by impoſition of hands; and the knowledge which they had by inſpiration of the whole doctrine of Chriſt. Moreover, the object of their miſſion was altogether of a different kind from that of any ordinary paſtor; and this was to propagate the goſpel throughout the world both among Jews and Pagans, and not to take charge of any particular flock. Further, as a full proof that the matter was thus univerſally underſtood, both in their own age, and in the times immediately ſucceeding, no one, on the death of an apoſtle, was ever ſubſtituted in his room; inſomuch that when that ſacred college was extinct, the title became extinct with it. It is alike true alſo of the evangeliſts, that their office was temporary, and that their charge extended to the whole church; and their title, like that of an apoſtle, ſunk with thoſe who firſt enjoyed it. Such were Philip, Timothy, Titus, and probably Mark, and Luke. As to the dates or poſtſcripts ſubjoined to the epiſtles in the common bibles, and diſtinguiſhing Timothy and Titus by the appellation of biſhops, it is now univerſally agreed among the learned, that they are of no authority. They are not found in ſome of our beſt and moſt ancient MSS.; and they are generally allowed to be the ſpurious additions of ſome eaſtern biſhop or monk, at leaſt 500 years after Chriſt. It is certain, however, that in the three firſt centuries, neither Timothy nor Titus is ſtyled biſhop by any writer. In the iſland of Crete, of which Titus is ſaid to have been ordained the firſt biſhop, there were no fewer, according to the earlieſt accounts and catalogues extant, than 11 biſhops. Indeed, ſo little can the inſtructions given by Paul to Timothy and Titus be made to quadrate with any ordinary miniſtry that ever obtained in the church, that the learned Dr. Whitby (ſee his Preface to the epiſtle to Titus) concludes, that their's was extraordinary as well as temporary, and that they were not ſucceeded in it by any that came after them. Hence it is inferred, that all the arguments alleged in favour of the diſtinction between biſhops and preſbyters in the early age of the church, by Epiphanius and others, from ſome paſſages in the epiſtles to Timothy and Titus, proceed upon the miſtaken notion, that they were properly biſhops in the modern acceptation of the term; a notion utterly unknown to that Chriſtian antiquity, which deſerves the name of primitive, and alſo incompatible with the authentic accounts we have concerning theſe extraordinary miniſters, who were not made biſhops till about 500 years after their death.

Some have deduced an argument in favour of the apoſtolical antiquity of epiſcopacy, from the epiſtles to the ſeven churches of Aſia mentioned in the Apocalypſe, which are addreſſed to the angels of theſe ſeparately in the ſingular number. From the firſt chapter of that book it appears, that each epiſtle is intended for the whole church or congregation mentioned in the direction or ſuperſcription; and yet one perſon, called the angel of that church, is addreſſed in the name of the whole. Hence ſome have inferred, that the perſon denominated angel, was an order differing from that of other miniſters, and ſuperior to it: whilſt others have conſidered the appellation as deſcriptive of the whole collective body. An intermediate opinion, advanced by ſome critics, is more probable. This ſuppoſes the neceſſity, for the ſake of order, that in their conſiſtories or congregations one ſhould preſide, both in the offices of religion, and in their conſultations for the common good; and that this preſident, or chairman, is here addreſſed under the name of angel. This interpretation affords us alſo the moſt plauſible account of the origin of the more conſiderable diſtinction, which afterwards obtained between biſhop and preſbyter. It was the diſtinction of one paſtor in every church, marked by the apoſtle John, though not made by any who had written before him, which led Tertullian, whoſe publication firſt appeared about a century after the apoſtles, to conſider him as the inſtitutor of epiſcopacy. By thoſe who deny the ſuperiority of biſhops to preſbyters in the firſt age of the church, it is alleged, that the firſt reformers and founders of the church of England, as well as many of its moſt learned and eminent doctors, have not pretended this diſtinction to be of divine, but merely of human inſtitution; not grounded upon ſcripture, but only upon the cuſtom or ordinances of this realm. To this purpoſe, the declaration made of the functions, &c. of biſhops and prieſts, and ſigned by more than 37 civilians and divines, among whom were 13 biſhops, Cranmer and others, affirms, that in the New Teſtament there is no mention made of any degrees or diſtinctions in orders, but only of deacons or miniſters, and of prieſts or biſhops. (See Bp. Burnet's Hiſt. Ref. vol. i. Append. p. 321.) Beſides, the book, entitled "The Inſtitution of a Chriſtian Man," ſubſcribed by the clergy in convocation, and confirmed by parliament, owns biſhops and preſbyters to be the ſame. Moreover, that the main ground of ſettling epiſcopal government in this nation, was not any pretence of divine right, but the convenience of that form of church government to the ſtate and condition of the church at the time of the reformation, the learned Stillingfleet affirms (Irenic. c. 8. Works, vol. ii. p. 396, &c.), and proves it to be the ſentiment of archbiſhop Cranmer and of other reformers, in the reigns of Edward VI. and of queen Elizabeth, ſuch as archbiſhop Whitgift, biſhop Bridges, Loe, Hooker, Sutcliffe, Hales, Chillingworth, &c. It was alſo the opinion of archbiſhop Uſher, that biſhop and preſbyter differed only in degree and not in order; and that in places where biſhops could not be procured, the ordination of preſbyters was valid. See ORDINATION. "As for the notion of diſtinct offices of biſhop and preſbyter," ſays biſhop Burnet, in his "Vindication of the church of Scotland," p. 336. "I confeſs it is not ſo clear

clear to me, and therefore since I look upon the sacramental actions as the highest of sacred performances, I cannot but acknowledge those who are empowered for them must be of the highest office in the church."

Although, in the apostolic times, bishops and presbyters were synonymous, and co-ordinate with respect to their ministerial powers, and they were ordained to their office by prayer, accompanied with imposition of hands; yet a certain priority, or presidentship, for the sake of order, or in deference either to seniority or to distinguished talents, was allowed to one of their number. But he seems to have been only a kind of moderator in their assemblies, and to have had no more power than that of giving a single vote in common with the rest of his brethren. By those who adopt this reasoning, and who trace the original of the distinct order of bishops, which was introduced in the second and third centuries, to this practice, it is allowed that pastors were from the beginning vested with a superintendency over the congregation or church merely in spiritual matters; and it is alleged, that some of the titles that are thus given them in Scripture, such as ἡγεμενοι, προεστωμενοι, guides and governors, imply this kind of superintendence. But at this time several things relating to the church were conducted in common by the pastors, the deacons, and the whole congregation. To this class we may refer all matters of scandal and offence, and also the election of their pastors and their deacons. Accordingly, Clement, in the fore-cited epistle, ch. xliv. speaking of the pastors, uses this expression: "Those who were constituted by the apostles, and afterwards by other eminent men, with the consent of the whole congregation." It appears also, by the epistles of Cyprian, written about the middle of the third century, that for the first three ages of the church, no final resolution was taken in any affair of moment, without communicating it to the people, and obtaining their approbation. In the second century a settled distinction obtained, in several respects, between the president, chosen by a plurality of votes, and distinguished by the apropriate title of bishop, which had before been common to all the presbyters, and the other presbyters. Many other titles, besides that of bishop, which they had all enjoyed in common, were restricted to him who was regarded as their head, such as ἡγεμενος, προεστως, πρωτοκαθεδρος, προεστωμενος, ποιμην, and some others. These titles, independently of the talents, virtues and services that attended them, claimed respect and deference. The concurrence of the president thus honoured, was considered as a necessary sanction to all ecclesiastical resolutions and measures; and by degrees every act became valid which bore the stamp of his authority. Those who presided over churches, which were established in some of the principal cities, were honoured with peculiar pre-eminence, and to this advancement analogy to the civil government did not a little contribute. It is not improbable, that the church of Jerusalem, when it became numerous, and was deprived of the ministry of the apostles, who were gone to instruct the other nations, was the first which chose a president or bishop; nor it it less probable, that the other churches followed by degrees this example.

The first ancient author who mentions bishop, presbyter, and deacon, as three distinct orders in the church, is, as we have already observed, Ignatius, who is supposed to have written about the 16th year of the second century. But as several of the epistles ascribed to him, are spurious, no great stress can be laid upon his authority. However, he seems, with peculiar earnestness, to inculcate obedience and subjection to the bishop, as well as to the presbyters and deacons. Mr. Dodwell accounts for his zeal in establishing the bishop's authority, by supposing that it was at that time a new thing, totally unknown in the church; and, according to this opinion, he says, that it is in vain to look for any trace of episcopal authority in the New Testament. Irenæus, who is supposed to have written about the middle of the second century, sometimes uses the names bishop and presbyter indiscriminately, and at other times with some kind of distinction; but it is not easy to determine, whether by these two appellations he means the same order, or two different orders. Dr. Pearson admits that these names are often interchanged by this father, and others of his time, even to the end of the century; but he affirms at the same time, that in regard to their own contemporaries, the offices of individuals are never thus confounded, insomuch that a person who was in their time a bishop, is not called a presbyter, nor is a presbyter called a bishop. It is allowed, that the distinction of these orders began about this time generally to prevail, though the difference was not nearly so considerable as it became afterwards. Another author, by whom the three orders seem to be discriminated, and whose testimony is commonly adduced in support of their apostolical institution, is Pius, bishop of Rome, who is supposed to have written before the middle of the second century, but after Ignatius and Polycarp: he uses an expression, however, which does not indicate any high opinion of the superiority of the bishop in his time; "Let the presbyters and deacons reverence thee (the bishop), not as their superior, but as Christ's minister." Clement of Alexandria, at the close of the second century (see his Strom. l. 1.), strongly marks the distinction between presbyter and deacon; but he seems to intimate, that the distinction between bishop and presbyter was, even in his days, comparatively not worthy of his notice. At this time, however, every church had its own pastor, or bishop, and only one under this appellation, and every bishop had only one congregation or church. Sir Peter, afterwards lord, King (ubi infra) has proved these assertions by a variety of citations from ancient writers; he has also shewn, that a bishop's diocese did not exceed the bounds of a modern parish. See DIOCESE. The presbyters, according to this writer, were the curates and assistants of the bishop, and though inferior to them in degree, yet they had the same inherent right with the bishops, and were equal to them in order. "A bishop" says this author, "preached, baptized, and confirmed, so did a presbyter; a bishop excommunicated, absolved, and ordained, so did a presbyter; whatever a bishop did, the same did a presbyter; the particular acts of their office were the same." In the age of Cyprian, about the middle of the third century, it appears that the presbyters were considered as vested with the power of conferring orders. (Cyp. Epist. 5. and 75.) In the age of Hilary, about the middle of the fourth century, it appears, that the whole distinction of the episcopate is ascribed by him to seniority in the ministry, without either election or special ordination. When the bishop died, the senior colleague succeeded of course. As to ordination it was the same in both; and bishop meant no more than first among the presbyters, or senior presbyter. Jerome, who wrote about the end of the fourth and beginning of the fifth century, says (In Titum. l. 5. Op. vol. x. p. 1700.) that, among the ancients, priests and bishops were the same; but that by degrees the care of a church was assigned to one person, in order to prevent dissension. In another place (Op. vol. vi. p. 198.) he says, "Let the bishops know, that they are above priests more by custom than by the appointment of Christ." He also observes (Anecdotes, p. 24. 54.), that at the beginning, churches were governed by the common council of presbyters, like an aristocracy; but aftewards the superintendency was given to one of the presbyters,

presbyters, who was then called the bishop, and who governed the church, but still with the council of the presbyters. Dr. Hammond (Annot. Acts xi. 30.) has advanced a singular opinion, viz. that the apostles instituted only the offices of bishop and deacon, and that the intermediate office of presbyter was soon afterwards introduced. But that such a middle order should be erected at once, immediately after the times of the apostles, is much more unlikely, than that it arose gradually out of an inconsiderable distinction, which had obtained from the beginning.

At the close of the third century, the ecclesiastical government, which very generally prevailed, was of that kind which might justly be denominated a parochial episcopacy. The bishop, who was properly the pastor, had the charge of a single parish; and the parishioners assembled for the purposes of public worship, and for the celebration of religious institutions, in one place, at which the bishop commonly presided; the bishop was assisted by presbyters, who formed his council in judicial and deliberative matters, and who performed religious functions both public and private. To these were added deacons. See DEACON. The next step was the extension of the oversight of one bishop to many congregations, which branched out of the original church by an accession of converts; and in this stage of the progress of episcopacy, the several presbyters had their separate parishes, and continued in subordination to the bishop, who was acknowledged as their common head. At this period, an order of bishops, called *chorepiscopi*, or rural bishops (see CHOREPISCOPUS), held the middle rank between bishops and presbyters, being inferior to the former, and superior to the latter. This state of the church may be denominated diocesan episcopacy.

Though bishops, in the opinion of those whose sentiments we are now representing, were originally no other than presbyters; the manner of their ordination being the same, and the presbyters discharging every part of the office of a bishop; no sooner was the distinction between them established, than the bishops began to appropriate certain functions to themselves. It appears, by the act of the third council of Carthage, A. D. 397, that, whereas, before, priests had the power of assigning the time of public penance, and of giving absolution, as also of consecrating virgins, and of making the chrism, without the advice of the bishop, all these things were forbidden by these canons, and appropriated to the bishops. But the principal circumstance by which the bishops were afterwards distinguished, was the power of confirming the baptized, when that chrism was applied. See CONFIRMATION. After the reign of Adrian, when Jerusalem was utterly destroyed, and the Jews dispersed, an opinion began to prevail among Christians, that their ministers succeeded to the characters, rights, and privileges of the Jewish priesthood; and this was another source of honour and profit to the clergy. Another circumstance, which contributed in no small degree to the progress of episcopal authority, was the constitution of provincial councils, which insensibly superseded the importance of particular churches, and enabled the bishops by an alliance with them to obtain a much larger share of executive and arbitrary power. As soon as they became connected by a sense of their common interest, they were empowered to attack, with united vigour, the original rights of their clergy and people. "The prelates of the third century," says Gibbon (Hist. vol. ii. p. 335, &c.), "imperceptibly changed the language of exhortation into that of command, scattered the seeds of future usurpations, and supplied, by scripture allegories and declamatory rhetoric, their deficiency of force and reason. They exalted the unity and power of the church, as it was represented in the episcopal office, of which every bishop enjoyed an equal and undivided portion. Princes and magistrates, it was often repeated, might boast an earthly claim to a transitory dominion; it was the episcopal authority alone, which was derived from the deity, and extended itself over this and another world. The bishops were the vicegerents of Christ, the successors of the apostles, and the mystic substitutes of the high priest of the Mosaic law. Their exclusive privilege of conferring the sacerdotal character invaded the freedom of clerical and popular elections; and if, in the administration of the church, they still consulted the judgment of the presbyters, or the inclination of the people, they most carefully inculcated the merit of such a voluntary condescension. The bishops acknowledged the supreme authority which resided in the assembly of their brethren; but in the government of his peculiar diocese, each of them exacted from his *flock*, the same implicit obedience, as if that favourite metaphor had been literally just, and as if the shepherd had been of a more exalted nature than that of his sheep." The same causes, which at first had destroyed the equality of the presbyters, introduced among the bishops a pre-eminence of rank, and from thence a superiority of jurisdiction. In spring and autumn, when they met in provincial synod, the multitude was governed by the wisdom and eloquence of a few; and, besides, the office of perpetual presidents in the councils of each province, was conferred on the bishops of the principal city; and these aspiring prelates, who soon acquired the lofty titles of metropolitans and primates, secretly prepared themselves to usurp over their episcopal brethren the same authority which the bishops had so lately assumed above the college of presbyters. Hence gradually arose the pre-eminence which the ambition of the Roman pontiff gained over the other provinces and churches. King's Constitution, &c. of the Primitive Church, ch. i.—v. Campbell's Eccl. Hist. vol. ii. Mosh. Eccl. Hist. vol. i. p. 104, &c. Neal's Hist. Purit. vol. i. p. 670, &c. 4to. Pierce's Vindication.

It is the opinion of many approved writers on this subject, among whom may be reckoned many episcopalians and dissenters in our own country, and many learned foreigners, that no particular form of church government was authoritatively prescribed either by our Lord or his apostles; but that Christians were left at liberty to choose such as might be best adapted to their circumstances and to the state of society, and most conducive to the edification and tranquillity of the church, and of individuals in future ages. See CHURCH.

When new occasions required new measures, in a little time the functions of the priesthood were divided, and the priests distinguished into degrees; the political part of religion being assigned principally to bishops, and the evangelical to the priests, &c. or rather, as some will have it, the functions of teaching and preaching were reserved to the bishop, and that of ordination superadded; which was their principal distinction, and the mark of their sovereignty in their diocese.

By the ancient discipline, bishops were to be married once, and not to put away their wives on pretence of religion; but a second marriage was a disqualification for this order. If they lived chaste, they were ranked as confessors.

Some bishops in the middle age, on account of their *regalia*, or temporalities, were obliged to a military service called *hostis*, by which they were to lead their vassals into the field, and attend the king in his military expeditions. This Charlemagne excused, and even forbade; but the prohibition was little regarded, since we find the thing often practised afterwards. Du-Cange.

The election of bishops was anciently placed in the clergy and

and the people of the parish, province, or diocese, or of the clergy and laity, as they were afterwards called; nor did any church apply to the neighbouring bishops to assist at the ordination. Irenæus was ordained by priests only; and such was the general custom of the church of Alexandria, till the beginning of the fourth century. Cyprian also says, that it belonged to the people chiefly to choose worthy pastors, and to refuse the unworthy. Thus Alexander was chosen bishop of Jerusalem. Fabianus and Cornelius of Rome, and Cyprian of Carthage. When the people had thus elected a bishop, they presented him to the neighbouring bishops for their approbation and consent; because, without their concurrent assent, no bishop could be legally instituted or confirmed. This was the case with regard to Alexander, already mentioned, and Sabinus, bishop of Emerita in Spain. After election and confirmation, the next act was the ordination or instalment of the bishop, which was done in his own church by the neighbouring bishops, who were invited to attend on the occasion. The attendance of the neighbouring bishops, which seems to have been at first voluntary on both sides, became customary, and at length necessary; and it was an established rule, that the concurrence of these was indispensible, one of whom laid his hand on the head of the new bishop, when he was recommended by prayer to the blessing of God. In the third century, this was always done by the metropolitan bishop; or at least it was never done without his consent or order. The second council of Nice ordered that bishops should be chosen by other bishops; but in the west, the people preserved the right of choosing their bishops, till after the reign of Charlemagne and his sons; and it was not taken from them till the the council of Avignon, in 1050. Basnage Hist. Eglises Reformées, vol. iii. p. 24.

Under the plea of the tumult that attended popular elections, the emperors and other sovereigns of Europe, took the appointment in some degree into their own hands; reserving to themselves the right of confirming these elections, and of granting investiture of the temporalities, without which confirmation and investiture, the elected bishop could neither be consecrated, nor receive any secular profits. This right was acknowledged in the emperor Charlemagne, A. D. 773, by pope Adrian I. and the council of Lateran, and universally exercised by other Christian princes; but the policy of the court of Rome contrived to exclude the laity from any share in these elections, and to confine them wholly to the clergy; but the mere form of election appeared to the people to be of little consequence, while the crown was in possession of an absolute negative, which was almost equivalent to a direct right of nomination. Indeed, princes and magistrates, patriarchs and popes, have usurped the power of electing bishops. The election was to be within three months after the vacancy of the see; and the person to be chosen out of the clergy of that church. Formerly the bishop claimed a share in the election of an archbishop; but this was set aside by the popes.

In England, during the Saxon times, the right of appointing to bishoprics is said to have been in the crown, because the rights of confirmation and investiture were, in effect, though not in form, a right of complete donation. But when, by length of time, the custom of making elections by the clergy was fully established, the popes began to except to the usual method of granting these investitures, which was "per annulum et baculum," by the prince's delivering to the prelate a ring, and pastoral staff, or crosier; pretending that this was an encroachment on the church's authority, and an attempt by these symbols to confer a spiritual jurisdiction: and pope Gregory VII. about the close of the 11th century, published a bull of excommunication against all princes who should dare to confer investitures, and all prelates who should venture to receive them. At length, however, when the emperor Henry V. agreed to remove all suspicion of incroachment on the spiritual character by conferring investitures for the future "per sceptrum" and not "per annulum et baculum;" and when the kings of England and France consented also to alter the form in their kingdoms, and receive only homage from the bishops for their temporalities, instead of investing them by the ring and crosier; the court of Rome found it prudent to suspend for a while its other pretensions. This concession was obtained from king Henry I. in England, by means of that obstinate and arrogant prelate archbishop Anselm; but king John, about a century afterwards, in order to obtain the protection of the pope against his discontented barons, was also prevailed upon to give up by a charter, to all the monasteries and cathedrals in the kingdom, the free right of electing their prelates, whether abbots or bishops; reserving only to the crown the custody of the temporalities during the vacancy; the form of granting a licence to elect, which is the original of our "congé d'elire," on refusal whereof the electors might proceed without it; and the right of approbation afterwards, which was not to be denied without a reasonable and lawful cause. This grant was expressly recognized and confirmed in king John's Magna Charta, and was again established by stat. 25 Ed. III. st. 6. § 3. But by stat. 25 Hen. VIII. cap. 20. the ancient right of nomination was, in effect, restored to the crown. The English succession of protestant bishops stands on this last ground. The king being certified of the death of a bishop by the dean and chapter, and his leave requested to elect another, the *congé d'elire*, or usual licence, is sent to them, with a letter missive, nominating the person whom he would have chosen. The election is to be within twelve days after the receipt of it, otherwise the king by letters patent appoints whom he pleases; and the chapter in case of refusing the person named by the king, incurs a *præmunire*. The election or nomination, if it be of a bishop, must be signified by the king's letters patent to the archbishop of the province; if it be of an archbishop, to the other archbishop and two bishops, or to four bishops; requiring them to confirm, invest, and consecrate the person so elected; which they are bound to perform immediately, without any application to the see of Rome. If such archbishop, or bishops, refuse to confirm, invest, and consecrate such bishop elect, they shall incur all the penalties of a *præmunire*. After election, and its being accepted of by the bishop, the king grants a mandate under the great seal for confirmation, which the archbishop consigns to his vicar-general, consisting mostly in a solemn citation of such as have any objections to the bishop elect, a declaration of their contumacy in not appearing, and an administration of the oaths of allegiance and supremacy, of simony, and canonical obedience. Sentence being read by the vicar-general, the bishop is installed in the province of Canterbury by the archdeacon: the fact is recorded by a public notary; and the bishop is invested with full powers to exercise all spiritual jurisdictions, though he cannot sue for his temporalities till after consecration. Then follows the consecration by the archbishop, or some other bishop appointed by lawful commissions, and two assistant bishops: the ceremony of which is much the same as in the Romish church, save that, having put on the episcopal robe, the archbishop and bishops lay their hands on the new prelate's head, and consecrate him with a certain form of words. The fees of the whole process are said to amount to about 600l.

The process of the translation of a bishop to another bishopric

ſhopric only differs in this, that there is no conſecration. The age of a biſhop is to be at leaſt thirty years; and, by the ancient diſcipline, none were to be choſen but thoſe who had paſſed though all the inferior orders; but, in ſome caſes of neceſſity, this was diſpenſed with, and deacons, nay laymen, were raiſed *per ſaltum* to the epiſcopal dignity.

The form of conſecrating a biſhop is different in different churches. Ordinarily, at leaſt three biſhops are required in the ceremony of conſecrating a biſhop; but, in ſome caſes, a ſingle one might ſuffice. In the Greek church, the candidate for the epiſcopate, who is always an *archimandrite* or *hieromachus*, i. e. an abbot or chief monk in ſome monaſtery, being named to the vacant ſee, and the election being confirmed, repairs, at the time appointed, to the church where the conſecration is to be performed. Being arrived, he is introduced by the proto-pope and proto-deacon to the archbiſhop and biſhops, who are arranged in proper order on a temporary theatre or platform erected in the church for the occaſion. He there gives an account of his faith; declares ſolemnly that he has neither given nor promiſed money, or any bribe-worthy ſervice, for his dignity; and promiſes to adhere ſteadily to the traditions and canons of the eaſtern church, to viſit his dioceſe regularly, and to oppoſe ſtrenuouſly all innovations and hereſies, particularly the errors of the Latin church. This being done, the archbiſhop ſays, "The grace of the Holy Spirit, through my humility, exalts thee N. archimandrite, or hieromachus, beloved of God, to be biſhop of the cities N. N. which God preſerve." With much ceremony the biſhop elect is then conducted from the theatre, within the rails of the holy altar, where he kneels down with the other biſhops, who hold open over his head the holy goſpel with the letters inverted, the archbiſhop ſaying aloud, "The divine grace, which always healeth our infirmities, and ſupplieth our defects, by my hand conducteth thee N. archimandrite, or hieromachus, beloved of God, biſhop elect of the cities of N. N. which God preſerve!—Let us pray therefore for him, that the grace of the moſt Holy Spirit may come upon him." Then the prieſts ſay thrice, "Lord have mercy upon us;" and while the biſhops continue to hold the goſpel, the archbiſhop ſigns the newly conſecrated biſhop thrice with the ſiga of the croſs, ſaying, "In the name of the Father, and of the Son, and of the holy Ghoſt, now and for ever, even unto ages of ages. Amen." Then all the biſhops putting their right hands on his head, the archbiſhop prays that he may be confirmed in the office of which they have judged him worthy, that his prieſthood may be rendered irreproachable, and that he himſelf may be made holy and worthy to be heard of God. After this, one of the aſſiſting biſhops reads a ſhort litany in a low voice, to be heard only by thoſe within the altar, and the other biſhops make the reſponſes. At the end of the litany, the archbiſhop, laying his hand again upon the head of the newly conſecrated biſhop, prays in very decent and devout terms, that Chriſt will render him an imitator of himſelf, the true ſhepherd; that he will make him a leader of the blind, a light to thoſe who walk in darkneſs, and a teacher of infants; that he may ſhine in the world, and receive at laſt the great reward prepared for thoſe who contend boldly for the preaching of the goſpel. After this the paſtoral ſtaff is delivered to the new biſhop, with a very proper and ſolemn exhortation from the archbiſhop, to feed the flock of Chriſt committed to his care. King's Rites and Ceremonies of the Greek Church.

In the Romiſh church, the biſhop elect being preſented by the elder aſſiſtant to the conſecration, takes the oath: he is then examined as to his faith; and after ſeveral prayers, the New Teſtament is drawn over his head, and he receives the chriſm or unction on his head. The paſtoral ſtaff, ring, and Goſpel, are then given him; and after communion, the mitre is put on his head: each ceremony being accompanied with proper prayers, &c. the conſecration ends with Te Deum.

Theſe laſt mentioned ceremonies are laid aſide in the conſecration of Engliſh biſhops. Nevertheleſs, the book of conſecration, compoſed by the biſhops, and approved by Edward VI. in the third year of his reign, and, two years afterwards, confirmed by act of parliament, in which ſome of them are enjoined, is declared to be the ſtandard for this purpoſe by the thirty-ſixth article. In queen Mary's reign this act was repealed, and the book of common prayer, and the book of ordination, were by name condemned. When Elizabeth came to the throne, queen Mary's act was repealed, and king Edward's prayer-book was again authorized; but the book of ordination was not expreſsly named, becauſe it had been a part of the common prayer book; and therefore it was not thought neceſſary to ſpecify the office of ordination any more than any other office of the common prayer book. But biſhop Bonner contended, that as the book of ordination had been by name condemned in queen Mary's reign, and had not been ſince revived by name, it was ſtill condemned in law; and, conſequently, that all ordinations conferred according to that form, were illegal and invalid. To obviate this objection, it was declared in a ſubſequent ſeſſion of parliament, that the office of ordination was conſidered as part of the common prayer book; and it was farther declared, that all ordinations which had been performed according to that office, were valid; and upon the ſame principle a ſimilar clauſe was inſerted in the 36th article.

The function of a biſhop in England may be conſidered as two-fold; viz. what belongs to his *order*, and what belongs to his *juriſdiction*. To the *epiſcopal order* belong the ceremonies of dedication, confirmation, and ordination; to the *epiſcopal juriſdiction*, by the ſtatute law, belong the licenſing of phyſicians, ſurgeons, and ſchoolmaſters, the uniting ſmall pariſhes (though this laſt privilege is now peculiar to the biſhop of Norwich), aſſiſting the civil magiſtrate in the execution of ſtatutes relating to eccleſiaſtical matters, and compelling the payment of tenths and ſubſidies due from the clergy.

By the common law, the biſhop is to certify the judges, touching legitimate and illegitimate births and marriages; and by that and the eccleſiaſtical law, he is to take care of the probate of wills, and granting adminiſtrations; to collate to benefices, grant inſtitution on the preſentation of other patrons, command induction, order the collecting and preſerving the profits of vacant benefices for the uſe of the ſucceſſors, defend the liberties of the church, and viſit his dioceſe once in three years. To the biſhop alſo belong ſuſpenſion, deprivation, depoſition, degradation, and excommunication.

The biſhops of England are all barons: barons in a threefold manner; viz. *feudal*, in regard of lands and baronies annexed to their biſhoprics; by *writ*, as being ſummoned by writ to parliament; and alſo by *patent* and *creation*. When William the Conqueror thought proper to change the ſpiritual tenure of frank-almoign, or free alms, under which the biſhops held their lands during the Saxon government, into the feudal or Norman tenure by barony; their eſtates were ſubjected to all civil charges and aſſeſſments, from which they were before exempt; and, in right of ſucceſſion to thoſe baronies, which were unalienable from their reſ-

pective dignities, the bishops and abbots were allowed their seats in the house of lords. But though these lords spiritual are, in the eye of the law, a distinct estate from the lords temporal, and are so distinguished in most of our acts of parliament, yet in practice they are usually blended together under one name of "the lords;" they intermix in their votes; and the majority of such intermixture joins both estates. And from this want of a separate assembly, and separate negative of the prelates, some writers have argued very cogently, that the lords spiritual and temporal are now in reality only one estate; which is unquestionably true in every effectual sense, though the ancient distinction between them still nominally continues. For if a bill should pass their house, there is no doubt of its validity, though every lord spiritual should vote against it, of which Selden and Sir Edward Coke give many instances; as, on the other hand, judge Blackstone presumes it would be equally good, if the lords temporal present were inferior to the bishops in number, and every one of those temporal lords gave his vote to reject the bill; though Sir Edward Coke seems to doubt, whether this would not be an "ordinance," rather than an "act," of parliament. Bl. Com. vol. i. 156. Bishops have the precedence of all other barons, and sit in the upper house as barons. They are twenty-four in number, exclusive of the bishop of Sodor and Man, who has no seat in the house of peers, besides two archbishops. Archbishops are distinguished by the titles of "Grace," and "Most reverend father in God by divine Providence;" and bishops, by those of "Lord," and "Right reverend father in God by divine permission." The former are said to be "inthroned," and the latter "installed." See ARCHBISHOP.

With respect to the order of precedency among one another, the archbishop of Canterbury takes the lead, then the archbishop of York, next to him the bishops of London, of Durham, and of Winchester. The other bishops follow according to the seniority of their consecration; excepting only, that a bishop being a privy counsellor, takes place after the bishop of Durham.

Bishops have two special privileges next to regal: the first, that in their courts they sit, and pass sentence, of themselves, and by their own authority; the bishops' courts being not like other courts, but writs are sent out in their own name, *teste* the bishop, not in the king's name, as is done in the king's courts: the second, that, like the king, they can depute their authority to another, as their suffragan, chancellor, commissary, &c.

They have this advantage also over lay-lords, that, in whatever Christian country they are, their episcopal degree and dignity are acknowledged; and they may, *quatenus* bishops, ordain, &c.

They have several immunities, as from arrests, outlawries, distress, &c. liberty to hunt in the king's forests, &c. to have *certain tuns of wine duty free*, &c. Their persons may not be seized, as lay-peers may, upon contempt, but their temporalities alone. They may qualify as many chaplains as a duke, viz. six. But, as they have no right to be tried themselves in the court of the lord high steward, as peers, they ought not to be judges there. For, though they are lords of parliament, and sit there by virtue of the baronies, which they hold "jure ecclesiæ," yet they are not ennobled in blood, and consequently not peers with the nobility, but merely lords of parliament. 3 Inst. 30, 31. Staunf. P. C. 153. In cases of capital offence, the bishops usually withdraw voluntarily, but enter a protest, declaring their right to stay. It is observable, that in the 11th chapter of the constitutions of Clarendon, made in parliament 11 Henry II. they are expressly excused, rather than excluded, from sitting or voting in trials, when they come to concern life or limb. The determination of the house of lords in the earl of Danby's case, (Lords' Journ. 15 May, 1679), which hath ever since been adhered to, is consonant to these constitutions, "that the lords spiritual have a right to stay and sit in court in capital cases, till the court proceeds to the vote of guilty, or not." This resolution, however, extends only to trials in full parliament; for to the court of the lord high steward, in which no vote can be given but merely that of guilty, or not guilty, no bishop, as such, ever was or could be summoned: and though the statute of king William regulates the proceedings in that court, as well as in the court of parliament, yet it never intended to new-model or alter its constitution, and consequently does not give the lords spiritual any right in cases of blood which they had not before; and their exclusion is more reasonable, because having no right to be tried in this court, as we have already said, they ought not to be judges there.

By law, the crime of *episcopicide*, which a clergyman commits by killing his bishop, is petty treason.

In Canada there is a bishop, resident at Quebec; and there are two bishops in America. In Denmark they have no archbishop, but there are six superintendents, or bishops; four in Norway, and two in Iceland. The chief see is that of Zealand, which yields about 1000l. a year; the others are those of Funen, valued at 760l., Aarhuus at 600l., Aalborg at 400l., Ripan at 400l.; in Norway, Christiana or Aggerhuus at 400l., Christianfand at 600l., Berghen at 400l., and Drontheim at 400l. The bishoprics of Skalholt and Holun, in Iceland, are only valued each at 150l.; but though far inferior in nominal value to the others, they may be considered, on account of the cheapness of living in Iceland, equal in real profit to the largest of the others. The bishop of Zealand, who is first in rank, and the bishop of Aggerhuus, are metropolitans. They have no temporalities; keep no ecclesiastical courts; have no cathedrals or prebends, &c. but are only *primi inter pares*, having the rank above the inferior clergy of the province, and inspection over their doctrine and manners. They are allowed two or three parishes each. Their habit is common with that of the other ministers. In Sweden are fourteen dioceses; the archbishopric of Upsala, and the bishoprics of Lindkoeping, Skara, Strængnœes, Wœsteras, Wexio, Abo, Lund, Borgo, Gotheborg, Calmar, Carlstadt, Hermosand, and Wisby, or Gothland. The revenues of Upsala and Wœsteras amount to about 1000l. a year; and those of the lowest bishoprics to 300l. There are also three superintendents, who rank as bishops, but do not sit in the house; these are the first chaplain to the king, the rector of St. Nicholas at Stockholm, and the first chaplain of the navy. The bishops are bound to residence, except during the meeting of the diet. A consistory of the clergy of the diocese elects the archbishop and bishops, by presenting them to the king for his nomination. They have also ecclesiastical courts, &c.

BISHOP-*abbot*, *episcopus abbas*, was an abbot invested with the episcopal order; of which we meet with several in the richer and more considerable monasteries.

BISHOP, *acephalous*, he who is immediately subject to the papal see, without any metropolitan over him.

BISHOP, *boy*. It was an ancient custom in such churches as had cathedral service, for the little choristers, on St. Nicholas' day, December the 6th, to elect one of their number to be the *episcopus puerorum*, the bearn, i. e. infant, or chorister bishop; who continued to preside over the rest, with an imitation of all the episcopal functions, till Innocent's day, Dec. 28, and then, after solemn processions and great pageantry, he laid down his office. He was chosen

chosen on St. Nicholas' day, because St. Nicholas was the patron saint of children; he having, when an infant, shewn such singular piety, as the legend says, that when he was at his mother's breast, he would not suck on Wednesdays and Fridays, that he might observe the fasts of the church.

The ceremonies attending the investiture of the *episcopus puerorum*, are prescribed by the statutes of the church of Sarum, which contain a title *de episcopo choristarum;* and also by the processional. From these it appears, that he was to bear the name and state of a bishop, habited, with a crosier or pastoral staff in his hand, and a mitre on his head. His fellows, the rest of the children of the choir, were to take upon them the style and office of prebendaries, and yield to the bishop canonical obedience; and farther, the same service as the very bishop himself, with his dean and prebendaries, had they been to officiate, were to have performed, the very same, mass excepted, was done by the choristers and his canons upon the eve and the holiday. The use of Sarum required also, that upon the eve of Innocent's day, the chorister bishop, with his fellows, should go in solemn procession to the altar of the Holy Trinity, in copes, and with burning tapers in their hands; and that during the procession, three of the boys should sing certain hymns mentioned in the rubric. The procession was made through the great door at the west end of the church, in such order, that the dean and canons went foremost, the chaplain next, and the bishop, with his little prebendaries, last; agreeably to that rule in the ordering of all processions, which assigns the rearward station to the most honourable. In the choir was a seat or throne for the bishop; and as to the rest of the children, they were disposed on each side of the choir, upon the uttermost ascent. And so careful was the church to prevent any disorder which the rude curiosity of the multitude might occasion in the celebration of this singular ceremony, that their statutes forbid all persons whatsoever, under pain of the greater excommunication, to interrupt or press upon the children, either in the procession or during any part of the service directed by the rubric; or any way to hinder or interrupt them in the execution or performance of what it concerned them to do. Farther it appears, that this infant-bishop did, to a certain limit, receive to his own use, rents, capons, and other emoluments of the church. In case the little bishop died within the month, his exequies were solemnized with great pomp; and he was interred, like other bishops, with all his ornaments. The memory of this custom is preserved, not only in the ritual books of the cathedral church of Salisbury, but by a monument in the same church, with the sepulchral effigies of a chorister bishop, supposed to have died in the exercise of his pontifical office, and to have been interred with the solemnities above noted.

From what period we are to date the progress of this ridiculous ceremony, it is not easy to discover, but it seems more than probable that it originated with the ancient MYSTERIES. In the wardrobe accompt of Edward I. published by the society of antiquaries, we find a boy-bishop, Dec. 7, 1290, saying vespers before the king, in his chapel at Heton, near Newcastle upon Tyne, for which he, and the boys who sung with him, received 40s.

This establishment, but with a far greater degree of buffoonery, was common in the collegiate churches of France. (See Dom. Marlot. Histoire de la Metropole de Rheims, tom. ii. p. 769.) A part of the ceremony in the church of Noyon was, that the children of the choir should celebrate the whole service on St. Innocent's day. (Brillon. Dictionaire des Arrets, artic. Noyon. ed. 1727.) In a curious book, called Voyages Liturgiques de France (Par. 8vo. 1718, p. 53.) is this account of the same practice in the church of Vienne in Dauphiny. "Le jour de Nöel après Vêpres, le jour de S. Etienne, et le jour de St. Jean l'Evangeliste, on faisoit des processions solennelles pour les diacres, les pretres, et les enfans de Chœur, comme autrefois à Rouen. Il y avoit aussi le lendemain à la messe solennitè pour eux. Les enfans de Chœur y avoient leur PETIT EVEQUE, qui faisoit tout l'office, excepté à la messe." And in the statutes of the archiepiscopal cathedral of Tulles, given in the year 1497, it is said, that during the celebration of the festival of the boy-bishop, "*Moralities* were presented, and shews of *miracles*, with farces and other sports, but compatible with decorum. After dinner they exhibited, without their masks, but in proper dresses, such farces as they were masters of, in different parts of the city." In England too, it appears, that the boy-bishop, with his companions, went about to different parts of the town; at least visited the other religious houses. (See the Computus Rolls of Winchester College, A. 1461.) And Strype records (Eccles. Memorials, iii. 310. ch. xxxix. and p. 387. ch. i.), that when this, among other ancient ceremonies, was restored by queen Mary, in 1556, "on St. Nicolas' even, St. Nicolas, that is, a boy habited like a bishop in *pontificalibus*, went abroad in most parts of London, singing after the old fashion, and was received with many ignorant but well disposed people into their houses, and had as much good cheer as ever was wont to be had before."

In the statutes of Eton college, given in 1441, the *episcopus puerorum* is ordered to perform divine service on St. Nicholas's day; and in those of Winchester college, 1380, *pueri*, that is, the boy-bishop, and his fellows, are permitted on Innocent's day to execute all the sacred offices in the chapel, according to the use of the church of Sarum. A similar clause to that at Eton occurs in the statutes of King's college, Cambridge; and Mr. Warton observes, in his History of Poetry, that the anniversary custom at Eton, of going *ad montem* originated from the ancient and popular practice here described.

In a small college, for only one provost, five fellows, and six choristers, founded by archbishop Rotherham in 1481, in the obscure village of Rotheram, in Yorkshire, this piece of mummery was not omitted. The founder leaves by will, among other bequests to the college, "a myter for the barne-bishop of cloth of gold, with two knopps of silver, gilt and enamelled." Hearne's Liber Niger Scacc. Append. 674. 686.

From the passage already quoted from the Voyages Liturgiques de France, it appears that, at least in one church, the *mass* was not allowed to be celebrated by the boy-bishop; and it is also expresly prohibited in the use of Sarum: but other and more frequent instances occur where the buffoonery was carried even to this height. In a fragment of the cellarers *Computus* of Hyde abbey near Winchester, A. D. 1397, we have a charge "pro epulis *pueri* CELEBRANTIS in festo Sancti Nicolai;" and so late even as the reign of Henry VIII., we find the same ceremony at St. Paul's.

It is surprising that Dean Colet, a friend to the purity of religion, and who had the good sense and resolution to censure the superstitions and fopperies of popery in his public sermons, should countenance this idle farce of the boy-bishop in the statutes of his school at St. Paul's, which he founded with a view of establishing the education of youth on a more rational and liberal plan than had yet been known, in the year 1512. He expresly orders, that his scholars "shall every Childermas (that is Innocent's) day, come to Pauli's churche, and hear the *childe-bishop's* (of St. Paul's cathedral) sermon

ſermon. And aſter it be at the hygh maſſe; and each of them offer a penny to the chylde biſhop, and with them the maiſters and ſurveyors of the ſcole."

This ſingular cuſtom was, however, prohibited in the council of Sens, A. D. 1485; and, not ſo much for its ſuperſtition as its levity and abſurdity, was abrogated in this country by king Henry VIII. in 1542, the words of whoſe proclamation may be ſeen in Mr. Warton's Hiſtory of Engliſh Poetry, vol. iii. p. 322. But queen Mary, who with the catholic liturgy reſtored all the pageantries of popery to their ancient ſplendour, revived the mummery before us; and on Nov. 13, 1554, an edict was iſſued by the biſhop of London to all the clergy of his dioceſe, to have a *boy-biſhop* in proceſſion.

We need hardly add, that on the acceſſion of Elizabeth, this ſilly mockery was ſet aſide; but Mr. Warton was inclined to think, that the practice of our plays being acted by the choir boys of St. Paul's church and the chapel royal, which continued till Cromwell's uſurpation, might be deduced from the *myſteries* and *moralities* which attended the ridiculous feſtival of St. Nicholas. See the Northumberland Houſehold Book, p. 440. Drake's Eboracum, p. 481. Warton's Hiſt. of Eng. Poetry, i. 248. ii. 375. 389. iii. 302, 303. 324. Proceſſionale Eccl. Sarum, edit. Rothom. 1555. Dugdale's Hiſt. of St. Paul's, 205, 206. Anſtis Ord. Gart. ii. 309. Knight's Life of Dean Colet, p. 362. Hawkin's Hiſt. of Muſic, ii. 5. Strype's Eccleſ. Mem. iii. 202. ch. xxv. 205, 206. ch. xxvi. Dugd. Monaſt. iii. 169, 170. 279.

Bishop, *cardinal*, a biſhop in chief, or *in capite*. St. Gregory ſometimes uſes the term for a proper biſhop. Anciently there were alſo biſhops, who by a peculiar privilege from the holy ſee, were ranked, and had a ſeat among the cardinals.

Bishops, *cathedral*, was alſo a title given to the proper biſhops, by way of diſtinction from the *chorepiſcopi*.

Bishops, *commendatory*, or biſhops "in commendam," are cardinals not of the order of biſhops, or other prelates, who yet hold biſhoprics "in commendam." The appellation had its origin during the reſidence of the papal ſee at Avignon, whence ſcarce any cardinal, prieſt, or deacon, was created, who held not one, two, three, or more biſhoprics in commendam. Du-Cange.

Bishop *deſigned*, *epiſcopus deſignatus*, denoted a coadjutor of a biſhop, who, in virtue of his office, is to ſucceed at the incumbent's death.

Bishop-*elect*, is he who has the king's nomination, with the ſanction of the chapter: but without conſecration.

Bishops, *exempt*, thoſe freed from the juriſdiction of the metropolitan, and immediately ſubject to the ſee of Rome alone.

Bishop *of the palace*, *epiſcopus palatii*, was probably the ſame with biſhop of the king's chapel, a title in the court of Bohemia. Du-Cange. Is was alſo a title given thoſe biſhops, who, by licence of the pope, dwelt in palaces of kings, to be in readineſs for ſpiritual ſervice and council in church matters.

Bishop *of the prime ſee*, denoted a "primate," otherwiſe denominated a "ſenior biſhop." See Primate.

Bishop *in partibus infidelium*, he who is dignified with the title of a biſhopric, whoſe diſtrict or dioceſe is in the poſſeſſion of infidels or heretics. By the canon law, a biſhop *in partibus* is qualified hereby to be a coadjutor of another biſhop. The denomination took its riſe from the expulſion of the biſhops and clergy out of the Holy Land by the Saracens; when flying into Italy for ſhelter, coadjutories were given them for their ſubſiſtence.

Bishops, *regionary*. See Regionary.

Bishops, *rural*. See Chorepiscopus.

Bishops, *ſuffragan*, are coadjutors or aſſiſtants of dioceſan biſhops, authoriſed by commiſſion from them.

Bishops, *vague*, thoſe without any dioceſe, ſometimes attendant in camps, or in foreign countries, for the converſion of infidels. The like vague biſhops were ſometimes alſo granted by popes to monaſteries, exempt from the juriſdiction of the dioceſan, where they performed all the epiſcopal functions. Du-Cange.

Bishop, *univerſal* or *catholic*, is a title given to the patriarch of Armenia.

Bishop *of the catholic or univerſal church*, a title ſometimes aſſumed by the popes.

Bishop *of biſhops*, was a title anciently given to the prelates of ſome of the greater and more honourable ſees, as Jeruſalem and Rome. The firſt who had the title was James, biſhop of Jeruſalem. Some will have the appellation to have been common to all biſhops.

Bishops, in the *Lutheran Church*, are thoſe more uſually called *ſuperintendents*, which ſee.

The Calviniſts allow of no other biſhops beſides preſbyters; but the Lutherans make ſome diſtinction, and give a ſuperiority or pre-eminence over the reſt of their "biſhops," "ſuperintendents," or "overſeers."

Bishop is alſo a quality ſometimes attributed to ſecular princes, in reſpect of their ſupremacy or juriſdiction in matters belonging to religion. See Supremacy. In this ſenſe it is that the emperor Conſtantine, in a letter to the biſhops in his dominions, calls himſelf "common biſhop," as being in ſome reſpects general biſhop of the whole Roman world.

Bishop *of the Jews*, the head of that people in England, choſen by themſelves, to whom they ſubmitted to be judged and governed according to their law. Prideaux's Connect. part ii. lib. v. p. 478. This office, which ſubſiſted under our Norman kings, and was licenſed by them, anſwered to the Æchmalotarchs in Babylon, and the Alabarchs in Egypt.

Bishops *at chess*, a kind of pieces, the third in rank, below queens, but above knights, diſtinguiſhed by their cloven heads. In Latin writers of the middle age, the biſhop is called *alphinus*; and by the French *le fou*, the *fool* or *madman*. See Chess.

Bishop's *Court*. See Court.

Bishop's *ſee*, or *ſeat*, originally denoted the throne or chair in the church where the biſhop ſat. It was alſo denominated Apsis.

Bishop's *ſee* alſo denotes the city or place where the reſidence of the biſhop is fixed.

Every biſhop's ſee was anciently called "ſedes apoſtolica;" though the appellation has ſince been reſtrained to the ſee of Rome.

Antiently biſhops ſeem to have had a right in England to ſit as judges in the hundred and county-courts. In aſter-times, they were forbid to ſit in ſecular courts, and had ſeparate courts erected for them; which proved an occaſion of much diſpute between the two juriſdictions. No church tenant might be ſued in any court but the biſhop's. There are alſo traces of a ſeparate court of the biſhops much earlier, among our Saxon anceſtors in the eighth century. The regard borne to the character of biſhops, made them the common arbitrators even of ſecular cauſes: they had the cognizance of all cauſes concerning lands in "frankalmoign;" and for eccleſiaſtics, were judges even in capital cauſes.

Bishop's *weed*, in *Botany*. See Ammi.

Bishop, *Bird*, in *Ornithology*. See Tanagra Episcopus.

Bishop *and his Clerks*, in *Geography*, a cluster of dangerous rocks, near the weſt coaſt of South Wales, at the entrance of St. George's channel, four miles weſt of St. David's. N. lat. 51° 54′. W. long. 5° 20′.

Bishop's *Auckland*. See Auckland.

Bishop's *Caſtle*, a market and borough town of Shropſhire, in England, ſpreads its ſcattered houſes over the ſide of a conſiderable eminence, at the baſe of which runs the ſmall river Clun. This town is an old corporation, and made its firſt return to parliament in the 27th of Elizabeth. Previous to that period, it belonged to the ſee of Hereford, and derived its name from being one of the ſeats, or caſtellated manſions of the biſhops. The corporation conſiſts of a bailiff, recorder and fifteen aldermen, who, with about thirty other inhabitants called burgeſſes, elect two members for the town. Here is a large weekly market on Fridays, which is much frequented by the Welſh, as are its ſix annual fairs. At ſome of the latter a great quantity of ſheep and pigs are ſold. This town was formerly under the protection of a caſtle, which is entirely deſtroyed. Biſhop's caſtle is 156 miles N. W. from London. It contains 241 houſes, and 1076 inhabitants.

At *Snede*, about two miles and a half N. W. from Biſhop's caſtle, a priory of black canons was founded in the time of Henry III., but was ſoon afterwards removed to *Cherbury*. This place, ſeated near the Severn, is ſuppoſed to have been built by Ethelfleda, and was afterwards poſſeſſed by the family of the Herberts, one of whom was created lord Herbert of Cherbury. This gentleman wrote an account of his own life, which has been publiſhed by Horace Walpole at his private preſs at Strawberry hill. Not far from this town on the borders of Montgomeryſhire, is an ancient encampment called *Biſhop's Moat;* and at Clun are the remains of an ancient caſtle, near which is a camp called *Bury-ditches*. About three miles hence is *Walcot*, the ſeat of lord Clive, who is patron of this borough. In the vicinity of Biſhop's caſtle, are three lofty ſingular hills, reſpectively named Condon-hill, Church-Stoke-hill, and Squilfar-hill. At *Moor Park*, is a reſpectable ancient manſion; the grounds are finely diverſified, and abound with fine woods.

Bishop's *Iſland*, a ſmall rocky iſland in Mal-bay, on the weſt coaſt of the county of Clare, in Ireland. N. lat. 52° 38′. W. long. 9° 35′. Beaufort.

Bishop's *Stortford*, a market town of Hertfordſhire, in England, is placed on the ſide of a hill, near the weſtern borders of Eſſex. Seated in the midſt of a corn country, it is remarkable for its number of malt-houſes, and for the quantity of malt annually made here; this is diſtinguiſhed by the name of brown malt, and is diſpoſed of principally to the London brewers. It is conveyed to the metropolis in barges, by a navigable canal, which was cut in 1779, and which joins the river Lee, at about 14 miles diſtance from this town. Before this navigation was opened, the malt, which is now lodged here, was carried to Ware and Stanſted, as the neareſt places for water-carriage; but ſince the above period, Stortford has become the depot for the malt made in this town and the neighbouring villages.

This place was evidently of ſome note previous to the conqueſt, as it appears from the Domeſday Survey, that the conqueror gave the town and caſtle to Maurice, biſhop of London. From this evidence it appears, that the caſtle here, which bore the name of Waytemore, was ſtanding prior to the Norman invaſion, though ſome writers aſſert that it was erected by William. It was probably repaired and ſtrengthened by him, but Mr. Salmon ſeems juſtified in the opinion, that it was conſtructed by the Eaſt Saxons to defend their borders. The lands paying caſtle-guard, lie between this place and the Ermine ſtreet, one of the great Anglo-Roman roads. The hill, or keep, on which the caſtle ſtood, is artificial, being evidently raiſed with earth brought from ſome diſtance. On the top was a well, and a breaſtwork of ſtone and mortar. A bank of earth runs from the ſummit acroſs the moory ground to the north-eaſt. "This caſtle," ſays Salmon, "muſt have been of ſome conſequence in the time of king Stephen, becauſe of the great deſire Geoffroy de Magnaville had, either to be maſter of it, or to have it pulled down; and Maud the empreſs engaged him to do one or t'other." The ſecurity derived from this fortification gave origin to the town, which had increaſed to ſome conſequence in the time of king John, who created it a borough, and inveſted the inhabitants with certain corporate privileges. This monarch ſeized the caſtle and town from W. de St. Maria, the biſhop of London, who was one of the three biſhops deputed to execute the pope's interdict upon England. This period was diſtinguiſhed by the alarming jealouſies and animoſities between the king and the pope with his prelates; and as Salmon expreſſes it, "the caſtle at Stortford, ſtands yet a monument of king John's power and revenge, and the biſhop's lands remain a monument of the pope's entire victory over him." In the time of Edward III. the town and caſtle, &c. again reverted to the biſhop of London, in whoſe ſee it ſtill continues, and who appoints a bailiff for this liberty, which includes the town and thirteen contiguous pariſhes. The biſhop's priſon was ſtanding in biſhop Bonner's time, but that and all the other old buildings have been ſince demoliſhed.

The ſtreets of the town are diſpoſed in the form of a croſs, with two long ſtreets interſecting each other at right angles. Though no particular manufacture is carried on here, yet the town is reſpectable and populous; it contains 456 houſes, and 2305 inhabitants. Here are a very conſiderable weekly market for grain, &c. on Thurſdays, and three annual fairs, which are moſtly appropriated to the ſale of horſes and cattle.

The church, dedicated to St. Michael, is a large lofty ſtructure, and, like moſt buildings, dedicated to that ſaint, ſtands on the higheſt ground in the neighbourhood. There were anciently three guilds and a chantry endowed here; and in the choir are nine ſtalls on each ſide. The interior of this building is decorated with a number of monuments, ſome of which are ancient. The great tythes of the pariſh are in the hands of laymen. In the town are ſome meeting-houſes for diſſenters, methodiſts, and quakers, alſo ſome alms-houſes, and a ſchool-houſe. The latter was built from a ſubſcription among the gentlemen of Hertfordſhire and Eſſex, who were inſtigated to this act by Dr. Thomas Tooke. This gentleman was zealouſly indefatigable in promoting and eſtabliſhing the foundation which has proved beneficial to the town and highly honourable to its founder and patrons. The building ſtands on arches, beneath which is a ſpace for market and ſhops. Dr. Tooke revived an annual ſchool-feaſt here, and charged his own eſtate with an annual preſent to the preacher. He alſo gave a chalice of 20l. value to the church, and was a great benefactor to the ſchool-library, which is a very good one, and was firſt eſtabliſhed by the Rev. Thomas Leigh, who was vicar of the church in 1680, &c. Beſides other donations to this library, it is cuſtomary for every gentleman to preſent a book at the time of leaving the ſchool. Biſhop's Stortford derives its compound name from being the property of the biſhop of London at an early period, and from its ſituation on the banks of the river Stort, which ſeparates it on the eaſt from the hamlet

hamlet of Hockerill. At a ſhort diſtance north of this town is Hadham parva, which is noted from being the burial place of the Capels, earls of Eſſex. Biſhop's Stortford is 30 miles north of London. Salmon's Hiſtory of Hertfordſhire.

Biſhop's *Waltham*, a ſmall town of Hampſhire, in England, derives a part of its name from having been a ſeat of the biſhops of Wincheſter. Some of their palace ſtill remains at a ſmall diſtance weſt of the town, and the ſcite now belongs to the ſee. Leland deſcribes it as "a right ample and goodly maner place, moted aboute, and a praty brooke running hard by it. It hath been of many biſhops' building." The celebrated William of Wykeham, biſhop of Wincheſter, reſided here during the laſt three years of his life, and died in this manſion, A. D. 1404, in the 80th year of his age. The houſe was partly demoliſhed in the civil wars of Charles I. when biſhop Kyrl was in poſſeſſion. Biſhop's Waltham is noted for its ſchools, both for gentlemen and ladies. It contains 191 houſes, and 1773 inhabitants, and has three annual fairs.

About five miles ſouth of the town is *Wickham*, a village rendered memorable from being the birth-place of the above-named biſhop. See Wykeham.

BISHOPING, in *Horſemanſhip*, is a term probably derived from *Biſhop*, the name of a horſe-dealer, and denoting a trick of the dealers in horſes for making them appear younger than they are, with a view of impoſing upon the purchaſer.

This is done by excavating the corner tooth of the inciſors with a ſteel graver, or file, and afterwards blackening the cavity with a hot iron. This mark, or excavation, is deemed by many the criterion of age, and that the horſe is young while this is preſerved.

To avoid being impoſed upon, the purchaſer ſhould conſider the general figure, not only of the corner tooth, but of all the inciſor teeth of the upper and lower jaw, for they all undergo a perpetual change of figure by age and wear.

An inciſor tooth of the horſe, at its firſt emerging from the jaw, has the viſible part of it flat, and covered every where with enamel; the outſide ſharp and projecting higher than the inſide, with a conical cavity in the middle, of various depth in different horſes, which renders it of not much value in deciding upon the age; in ſome it is ſo ſhort as to be obliterated by the ſixth year; in others it is ſo long as to be found till nine or ten, or later; it is, therefore, not a certain criterion of age: the general figure of the tooth is more to be depended upon in our eſtimation. The lateral width of the recent tooth, and its flatneſs, are very remarkable, and can never be imitated; as this wears away the tooth daily increaſes in its tranſverſe width, that is from front to back, and diminiſhes in its lateral width, forming, as the wear advances, nearly a triangle; theſe angles at length by age gradually diſappear, and the tooth preſents a rounder ſurface on its upper part, and at length the tooth becomes flattened on the ſides, and actually wider from front to back than from ſide to ſide. For it ſhould be recollected that the tooth is formed in its whole extent previous to its appearance externally, and that the jaw is abſorbed, to allow of its wear; the enamel, like a ſhell, deſcribing the figure and boundary of the tooth, which hollow ſhell is afterwards filled up with bone. A tranſverſe ſection, therefore, of the tooth, or a ſeries of them at different diſtances from its point, afford the exact figures of the ſurfaces of the teeth at the various periods of their wear, and allowing for contingencies which occaſion the teeth to be worn with more or leſs rapidity, as in crib biters, &c. will afford the trueſt criterions of age, and render impoſition in this way impracticable.

The teeth alſo they pretend, in ſome inſtances, to excavate on the inſide, and to ſharpen with a file: theſe bungling attempts, however, in no way reſemble the natural markings or ſurface of the tooth, nor could impoſe upon any one the leaſt experienced in obſerving the teeth. For what we conſider the beſt indications of the age of horſes, however, we refer the reader to the article Teeth *of Horſes*.

BISHOPRIC, the juriſdiction of a biſhop, or the diſtrict within which it is compriſed, called alſo "dioceſe," which ſee.

There are twenty-four biſhoprics, and two archbiſhoprics, in England and Wales. To the old ones ſubſiſting before the times of the Reformation, Henry VIII., by letters patent added ſix more biſhoprics; viz. thoſe of Weſtminſter, Cheſter, Glouceſter, Peterborough, Briſtol, and Oxford, ſtat. 34 and 35 Hen. VIII., cap. 17. Theſe ſees were all founded in the courſe of the years 1540, 1541 and 1542.

The ſee of Weſtminſter, having never had but one biſhop, was united to that of London, and its biſhop tranſlated to Norwich, by Edward VI., in 1550. The remaining biſhoprics are comprehended under two provinces, thoſe of Canterbury and York. The province of Canterbury includes the following biſhoprics, viz. 1. The biſhopric of London, containing Eſſex, Middleſex, and part of Hertford, and extending its juriſdiction to the Weſt India Iſlands. 2. Wincheſter, comprehending Surry, Hampſhire, and the iſles of Wight, Jerſey, Guernſey, and Alderney. 3. Litchfield and Coventry, to which belong Stafford, Derby, and part of Warwick and Shropſhire. 4. Lincoln, comprehending Lincoln, Leiceſter, Huntingdon, Bedford, Buckingham, and part of Hertford. 5. Ely, containing Cambridgeſhire. 6. Saliſbury, to which belong Wilts and Berkſhire. 7. Exeter, including Cornwall and Devon. 8. Bath and Wells, comprehending Somerſetſhire. 9. Chicheſter to which belongs Suſſex. 10. Norwich containing Norfolk, Suffolk, and a ſmall part of Cambridge. 11. Worceſter, comprehending Worceſter and part of Warwick. 12. Hereford, including Hereford and part of Shropſhire. 13. Rocheſter, to which belongs part of Kent. 14. Oxford, including Oxfordſhire. 15. Peterborough, containing Northampton and Rutland. 16. Glouceſter, comprehending Glouceſterſhire. 17. Briſtol, to which belongs the city of Briſtol, part of Glouceſterſhire, and the county of Dorſet. 18. Landaff, comprehending Glamorgan, Monmouth, Brecknock, and Radnor. 19. St. David's, including Pembroke, Cardigan, and Caermarthen. 20. St. Aſaph, containing the greateſt port of Flint, Denbigh, and Montgomery, and ſome part of Shropſhire. 21. Bangor, to which belong the counties of Angleſey, Caernarvon, Merioneth, and part of Denbigh and Montgomery. The province of York, comprehends—22. Durham, containing Durham and Northumberland. 23. Carliſle, including great part of Cumberland and Weſtmoreland. 24. Cheſter, to which belong Cheſhire, Lancaſter, Richmondſhire, which is part of York, together with part of Cumberland and Weſtmoreland. 25. Iſle of Man. The value of theſe ſees is not eaſily aſcertained, as it is very different from that which is ſtated in the king's books. It is a certain fact, whatever may be the primary occaſion of it, that the revenues of the biſhoprics are very unequal in value, and that there is alſo a great inequality in the patronage appertaining to the different ſees. Adverting to this circumſtance, Dr. Watſon, the preſent biſhop of Landaff, addreſſed a "Letter to his Grace the Archbiſhop of Canterbury," printed in 1783, propoſing a ſcheme for rendering the biſhoprics more equal to each other, with reſpect to both income and patronage, by annexing part of the eſtates, and part of the preferments, of the

the richer bishoprics, as they became vacant to the poorer. The advantages, resulting from the accomplishment of this object, and recited by the learned prelate, are such as follow: The poorer bishops would thus be freed from the necessity of holding ecclesiastical preferments "in commendam" with their bishoprics; a practice, which bears hard upon the rights and expectations of the rest of the clergy; which is disagreeable to the bishops themselves; which exposes them to much, perhaps undeserved, obloquy; but which certainly had better not subsist in the church. The bishops would also thus acquire a greater independence in the house of lords; and the measure would contribute to reduce the influence of the crown in that house. This plan would likewise ensure a longer residence of the bishops in their respective dioceses, as temptations to translations would be thus removed, and prelates would of course become more attached to their particular situations, gain a more intimate acquaintance with their clergy, and serve, by their doctrine and example, to produce the best effect in the conduct both of clergy and laity. See AUGMENTATION.

In Ireland there are 18 bishoprics, and 4 archbishoprics. Under the archbishop of Armagh, the primate, are the bishops of Meath, Kilmore and Ardagh, Dromore, Clogher, Raphoe, Down and Connor, and Derry. Under the archbishop of Dublin are Kildare, Ferns and Laughlin, and Ossory. Under the archbishop of Cashel are Waterford and Lismore, Limerick, Killaloe, Cork and Ross, and Cloyne. Under the archbishop of Tuam are Elphin, Cloyne, and Killala and Achonry. The primacy is estimated at 8000l. a year, Derry at 7000l., and the other bishoprics from 4000l. to 2000l. The catholics have a hierarchy nearly similar; but the metropolitans and bishops are considered by the protestants as merely titular.

The ancient ecclesiastical establishment of Scotland comprised two archbishoprics, those of St. Andrew's and Glasgow, and eleven bishoprics (that of Edinburgh having been only established by Charles I.), which, in the order of antiquity, may be thus enumerated; Galloway (St. Andrew's,) Dunkeld, Moray; five founded by David I., Brechin, Dumblane, Aberdeen, Ross (Glasgow); that of Argyle, or Lismore, was founded about the year 1200, because the bishops of Dunkeld did not speak the Irish tongue; the bishops of Orkney and of the western islands date from an earlier period, while their sees were not subject to the Scottish crown. But since the revolution in 1688, the ecclesiastical government of Scotland is of the Presbyterian form; and of course they have no bishoprics.

Bishoprics, as well as archbishoprics, may become void by death, deprivation, and resignation; but a bishop must resign to his metropolitan. See ARCHBISHOPRIC.

BISI, BONAVENTURA, in *Biography*, an eminent painter and engraver, and a monk, as some say, of the order of St. Francis, was born at Bologna, and became a disciple of Lucio Massari. His chief excellence consisted in copying in miniature, the pictures of Corregio, Guido, Titian, and other masters, which he finished with surprising beauty and elegance. Many of his works, which are highly valued, are in the duke's gallery at Modena. He also amused himself by etching some few plates from Parmegiano, Guido, &c. One, probably from his own design, was a "Holy family," with Elizabeth and St. John, dated 1631. He died in 1662; but his age is not known. Strutt and Pilkington.

BISIGNANO, in *Geography*, an inconsiderable town of Naples, in the province of Calabria citra, seated on a hill near the river Crati, surrounded by lofty mountains, and defended by a strong fortress. It gives the title of prince to the last remaining branch of the ancient house of San Severino, and is a bishop's see, suffragan of Rossano; distant 16 miles W. S. W. from Rossano, and about 18 miles N. from Cosenza. N. lat. 39° 38'. W. long. 168° 22'.

BISK, or BISQUE, in *Cookery*, a rich sort of broth or soup, made of pigeons, chickens, force-meat, mutton-gravy, and other ingredients. The word is French, formed, as some think from *biscotta*; because the *bisque*, consisting of a diversity of ingredients, needs several repeated coctions to bring it to perfection. There is also a *demi-bisque*, made at a low expence, in which only half the ingredients are used; and a *bisque* of fish, made of carps, minced with their roes and lobsters.

BISKET, BISQUET, or BISCUIT, usually denotes a delicate kind of bread prepared by the confectioners, of fine flour, eggs, sugar, and rose or orange water; or of flour, eggs, and sugar, with anise-seeds and citron-peel; baked in the oven, in tin or paper moulds. The word comes from the Latin *bis*, *twice*, and the French *cuit*, *coctus*, q. d. *baked*. We find divers sorts of such bisket, as seed-bisket, fruit-bisket, long bisket, round-bisket, Naples bisket, spunge-bisket, &c.

BISKET, *sea*, is a sort of bread much dried, to make it keep for the service of the sea. It was formerly baked twice or oftener, and prepared six months before the embarkation. It will hold good a whole year. To preserve sea biskets from insects, Dr. Hales advises to make the fumes of burning brimstone pass through the casks full of bread. Bisket may be likewise preserved a long time, by keeping it in casks well calked, and lined with tin.

The ship-bisket is too hard for some teeth; and in this case, it may be softened by toasting. But rusk is better; for being made of good fermented bread, sliced, and baked a second time, the pieces imbibe the water easily, soften immediately, and digest more kindly, and are therefore more wholesome than the unfermented bisket. Rusk, says Dr. Franklin, is the true original bisket, so prepared to keep for sea, being twice baked, as its name imports. See Franklin's Maritime Observations, in Amer. Trans. vol. ii. p. 322.

The ancients had their bisket prepared after the like manner, and for the like use as the moderns. The Greeks called it ἄρτον δίπυρον, q. d. "bread put twice to the fire." The Romans gave it the name of "panis nauticus," or "capta." Pliny denominates it "vetus aut nauticus panis tusus atque iterum coctus." By which it appears, that after the first baking, they ground or pounded it down again for a second. In some middle-age writers, it is called "paximas," "paximus," and "panis paximatus."

Among the Romans, we also meet with a kind of land-bisket for the camp-service, called, "buccellatum," sometimes, "expeditionalis annona," which was baked much, both to make it lighter for carriage, and less liable to corrupt, the coction being continued till the bread was reduced one-fourth of its former weight.

The process of bisket baking for the British navy is as follows: and it is equally simple and ingenious. The meal, and every other article, being supplied with much certainty and simplicity, large lumps of dough, consisting merely of flour and water, are mixed up together; and as the quantity is so immense, as to preclude by any common process a possibility of kneading it, a man manages, or, as it is termed, rides a machine which is called a horse. This machine is a long roller, apparently about four or five inches in diameter, and about seven or eight feet in length. It has a play to a certain extension, by means of a staple in the wall, to which is inserted a kind of eye, making its action like the machine by which they cut chaff for horses. The lump of dough being placed exactly in the centre of a raised platform, the man

man ſits upon the end of the machine, and literally rides up and down throughout its whole circular direction, till the dough is equally indented; and this is repeated till it is ſufficiently kneaded; at which times, by the different poſitions of the lines, large or ſmall circles are deſcribed according as they are near to or diſtant from the wall, till you have fairly the idea of an immenſe pentagraph. The dough in this ſtate is handed over to a ſecond workman, who ſlices it with a prodigious knife; and it is then in a proper ſtate for the uſe of thoſe bakers who attend the oven. Theſe are five in number; and their different departments are as well calculated for expedition and correctneſs, as the making of pins, or the working or printing of types. On each ſide of a large table, where the dough is laid, ſtands a workman; at a ſmall table near the oven ſtands another; a fourth ſtands by the ſide of the oven, to receive the bread; and a fifth, to ſupply the peel. By this arrangement the oven is as regularly filled, and the whole exerciſe performed in as exact time as a military evolution. The man on the further ſide of the large table moulds the dough, having previouſly formed it into ſmall pieces, till it has the appearance of muffins, although rather thinner, and which he does two together, with each hand; and as faſt as he accompliſhes this taſk, he delivers his work over to the man on the other ſide of the table, who ſtamps them with a docker on both ſides with a mark, on which are cut the broad ⋀, the letters PLY, and the number of the oven in which the biſkets are to be baked. As he rids himſelf of this work, he throws the biſkets on the ſmaller table next the oven, where ſtands the third workman, whoſe buſineſs is merely to ſeparate the different pieces into two, and place them immediately under the hand of him who ſupplies the oven, whoſe work of throwing, or rather chucking, the bread upon the peel, muſt be ſo exact, that if he looked round for a ſingle moment, it is impoſſible he ſhould perform it correctly. The fifth receives the biſket on the peel, and arranges it in the oven; in which duty he is ſo very expert, that though the different pieces are thrown at the rate of ſeventy in a minute, the peel is always diſengaged in time to receive them ſeparately. As the oven ſtands open during the whole time of filling it, the biſkets firſt thrown in would be firſt baked, were there not ſome counteraction to ſuch an inconvenience. The remedy lies in the ingenuity of the man who forms the pieces of dough, and who, by imperceptible degrees, proportionably diminiſhes their ſize, till the loſs of that time, which is taken up during the filling of the oven, has no more effect to the diſadvantage of one of the biſkets than to another.

So much critical exactneſs and neat activity occur in the exerciſe of this labour, that it is difficult to decide whether the palm of excellence is due to the moulder, the marker, the ſplitter, the chucker, or the depoſiter; all of them, like the wheels of a machine, ſeeming to be actuated by the ſame principle. The buſineſs is to depoſit in the oven ſeventy biſkets in a minute; and this is accompliſhed with the regularity of a clock; the clack of the peel, during its motion in the oven, operating like the pendulum.

The biſkets thus baked are kept in repoſitories, which receive warmth from being placed in drying loſts over the ovens, till they are ſufficiently dry to be packed into bags, without danger of getting mouldy; and when in ſuch a ſtate, they are then packed into bags of a hundred weight each, and removed into ſtorehouſes for immediate uſe.

The number of bake-houſes, belonging to the Victualling Office at Plymouth, are two; each of which contains four ovens, which are heated twenty times a day; and in the courſe of that time bake a ſufficient quantity of bread for 16,000 men. The granaries are large, and well conſtructed; when the wheat is ground, the flour is conveyed into the upper ſtories of the bake-houſes, whence it deſcends through a trunk in each immediately into the hands of the workmen.

The bake-houſe, belonging to the Victualling Office at Deptford, conſiſts of two diviſions, and has twelve ovens; each of which bakes twenty ſhoots daily (Sundays excepted); the quantity of flour uſed for each ſhoot is two buſhels, or 112 pounds, which baked produce 102 pounds of biſket. Ten pounds are regularly allowed on each ſhoot for ſhrinkage, &c.

The allowance of biſket in the navy is one pound for each man per day, ſo that one of the ovens at Deptford furniſhes bread daily for 2040 men.

BISLAN, in *Geography*, a town of Egypt on the Nile, 3 miles ſouth of Damietta.

BISLEY, anciently called *Biſelege*, is a ſmall market town, and a very extenſive and populous pariſh of Glouceſterſhire, in England. The pariſh includes an area of 6000 acres, the ſurface of which is diverſified with ſteep hills and narrow valleys. On the ſides of the former are ſome incloſed arable lands, interſperſed with copſes; and the latter are moſtly kept for meadow paſturage. Biſley, Chalford, and ſome neighbouring hamlets, are chiefly inhabited by perſons engaged in the woollen manufactures; and many fulling and dreſſing mills are erected on the river which runs through this pariſh. A ſmall weekly market is held here on Thurſdays, and here are two conſiderable fairs yearly. The church is a large handſome building, and, being ſeated on a high hill, is conſpicuous for many miles. Here is a ſmall free ſchool, and an endowment for clothing ſix widows yearly. The *canal*, which unites the Thames and Severn, paſſes through this pariſh; and near the verge of it, at Sapperton, enters a ſubterraneous *tunnel*, which is cut through the earth to an extent of two miles and five furlongs. This tunnel is lined with maſonry, and arched over at top, with an inverted arch at the bottom, except at thoſe places where the ſolid rock rendered it unneceſſary. The expence of cutting it was about eight guineas per cubic yard; but the plan of uniting the waters of the two great Britiſh rivers induced the proprietors to encounter extraordinary expence and trouble. The connection of the rivers Thames and Severn, by means of this canal, and alſo with the internal parts of the kingdom, by the Oxford and Coventry canals, which lead to Birmingham, and alſo to the counties of Stafford, York, Cheſter, and even to Weſtmoreland, forms a line of communication with the capital of the greateſt importance, and which has proved of great utility to the manufacturing towns through which it paſſes. On the 29th of April 1789, the acting engineer, Mr. Clowes, paſſed through the tunnel for the firſt time, in a veſſel of 30 tons burthen; and the junction was completed, and a veſſel paſſed from the Severn into the Thames, for the firſt time, on the 19th of November in the ſame year, in the preſence of a large concourſe of people, who came to witneſs and rejoice at the ſight. In 1788, their majeſties went from Cheltenham, on purpoſe to view this tunnel, which excited their ſurpriſe and admiration, more particularly when they learnt it had been conducted and completed by a private gentleman. The canal is 30 miles and 7 chains in length; in which courſe the water is raiſed 241 feet 3 inches, and made to fall 130 feet 6 inches. In the pariſh are 922 houſes, and 4227 inhabitants. Rudge's Hiſtory of the County of Glouceſter. Phillips' Hiſtory of Inland Navigation.

BISLINGUA, *double-tongue*, in *Botany*, a named uſed by many authors for the narrow-leaved *ruſcus*, or *butcher's broom*;

broom; called by many others the Alexandrian bay, or *laurus Alexandria*.

BISMARCK, in *Geography*, a town of Germany, in the circle of Upper Saxony, and Old Mark of Brandenburgh; 12 miles west of Stendal.

BISMEO, or BIXMEA, a town of Africa in the kingdom of Algiers, 25 miles west from Algiers.

BISMILLAH, in the *Mahometan Customs*, a solemn form, viz. *in the name of the most merciful God*, constantly placed at the beginning of their books and writings in general as a peculiar mark or distinguishing characteristic of their religion; it being counted an impiety to omit it.

The Jews, for the same purpose, make use of the form, "in the name of the Lord," or "in the name of the great God." Sale.

BISMILLAH is also used among the Arabs, as a word of invitation to eat. An Arab prince will frequently sit down to eat in the street before his own door, and call all that pass, even beggars, by this word, who do not fail to come and sit down to eat with him; for the Arabs are great levellers, and set every body on a footing with themselves. Pocock's Egypt, &c. p. 483.

BISMUTH, *Bismutum*, Wallerius; *Wismuth*, or *Bismuth*, Germ; *Bismuth*, Fr.; *Plumbum cinereum*, *Antimonium femininum*, *tin-glass*, of the older chemists.

Bismuth is a brittle metal, of a reddish white colour, and foliated fracture, is fusible at nearly the same temperature with lead, soluble with ease in nitric acid, and precipitable from it in the form of a white oxyd by the addition of pure water.

§ 1. *Ores of Bismuth.*

Sp. 1. *Native Bismuth. Gediegen Wismuth.*

The colour of this mineral is silver-white, with a slight tinge of red, frequently exhibiting an iridescent appearance on its surface. It occurs very rarely in mass, being generally disseminated, or investing; it is also met with feather-shaped, or reticular, or in lamellæ of a rectangular or triangular shape, either solitary, or heaped upon each other. It exhibits a metallic lustre of considerable brilliancy. Its fracture is perfectly foliated, or broad striated. It is semi-ductile, and breaks with some difficulty into irregular, somewhat blunt-edged fragments. Sp. grav. according to Kirwan = 9.57.

Native Bismuth is fusible at a very moderate temperature, often by the heat of a common candle; when exposed to the action of the blowpipe on charcoal, it volatilizes in the form of a white vapour, not unfrequently accompanied with an arsenical smell. It dissolves very easily, and with effervescence, in cold nitric acid; and is precipitable in the form of a white powder, on the addition of pure water.

The only two substances, with which native bismuth is liable to be confounded, are the sulphuret of bismuth and dendritical silver; the former of these, however, is not soluble with effervescence in cold nitric acid; and the latter may be distinguished by its colour and ductility.

Bismuth is one of the most partially diffused metals hitherto known; and it is chiefly found native, accompanied with kupfernickel, white and grey cobalt, black blende, native silver, and rarely galena. Its gangue is quartz, calcareous spar, or baroselenite; and it has hitherto been found only in veins in primitive mountains.

It is found at Joachimsthal, in Bohemia; at Freyberg, Annaberg, &c. in Saxony; in Sweden, Transylvania, and Britany.

Sp. 2. *Sulphuretted Bismuth. Wismuth glanz*, Emmerling. *Bismuth sulphuré*, Hauy.

The colour of this substance is between lead-grey and tin-white; but on the surface it is usually yellowish or iridescent. It is found either lamellar and in mass, or disseminated, or in small acicular crystals. Its primitive figure, according to Hauy, is that of a quadrangular prism. Its internal lustre is metallic and very brilliant; its fracture is broad or narrow striated, or foliated like galena. Sp. gr. according to Kirwan, = 6.131. It stains the fingers in a slight degree; and when reduced to powder, is of a glistering black.

When exposed to the blowpipe, it melts easily, giving out a sulphureous odour and a blue flame, and is almost entirely volatilized before it can be brought to the metallic state. There has been no very accurate analysis made of this ore; but from the experiments of Sage and La Peyrouse it appears to contain about 60 per cent. of bismuth, 36 of sulphur, and a little iron. There is some external resemblance between the lamellar variety of this mineral and galena; but the superior fusibility of the former is an easy and infallible characteristic.

Sulphuret of bismuth is very rare; and, where it occurs, is always accompanying native bismuth. It is found at Joachimsthal, in Bohemia; Altenberg and Johann-Georgenstadt, in Saxony; and at Bastnas, near Riddarhytta, in Sweden.

Sp. 3. *Oxyd of Bismuth*, *Bismuth ochre*, Kirw. *Wismuth-ocker*, Emmerling. *Bismuth oxydé*, Hauy.

This mineral is of a greenish yellow colour, passing into ash-grey, or straw-colour. It is sometimes found in mass, but more commonly disseminated or investing. It is opaque, and possesses a slight degree of internal lustre. Its fracture is fine-grained, uneven, or earthy. Sp. grav. considerable, but has not yet been accurately ascertained. It is either friable, or of the consistence of chalk, but occasionally gives fire with steel, on account of the particles of quartz with which it is mixed.

When exposed to the action of the blowpipe on charcoal, it is very easily reducible to the metallic state. It is soluble in nitric acid without effervescence, and precipitable for the most part by the addition of water.

Oxyd of bismuth is an extremely rare mineral. It has hitherto only been found at Schneeberg, in Saxony, accompanying native bismuth; in the Black Forest mines, in Swabia; and at Joachimsthal, in Bohemia. It is often confounded with the green earthy iron ore; but may be at once distinguished by its easy reduction before the blowpipe. Emmerling, vol. ii. p. 434, &c. Wiedenmann, p. 887. Brochant, v. 2. p. 434. Hauy, v. 4. p. 184. Kirwan, vol. ii. p. 263.

§ 2. *Assay and Analysis of Bismuth Ores.*

Sulphur and iron are the only substances that have been as yet detected in combination with this metal, as far as can be inferred from very imperfect analyses of the preceding ores. But Klaproth, in his examination of the bismuthic silver ore from Shapbach (Analyt. Ess. vol. i. p. 556.), found it to be a combination of lead, silver iron, copper, and sulphur, with bismuth; and from the experiments of this able chemist is deduced the following general method of analysing the ores of bismuth.

Having reduced the ore to a tolerably fine powder, pour upon it, in a capacious flask, five times its weight of nitric acid previously diluted with one third of water. The acid will begin to act immediately, without the assistance of heat; nitrous gas will be disengaged in great quantity; and the solution will assume a greenish yellow colour. When the acid has taken up as much as it can, or nearly so, pour it off, and digest the undissolved residue in a moderate heat, with equal parts of nitric acid and water, renewing the

menſtruum from time to time, till all the ſoluble parts of the ore are taken up. Add together the ſolutions, and reduce them by gentle evaporation to about half their bulk (if any cryſtals are depoſited, add a little pure warm water juſt ſufficient to take them up again); then pour the whole into a large quantity of rain water, at leaſt twenty times the bulk of the ſolution. The liquor will immediately aſſume a milky appearance, and, by ſtanding a ſhort time, will depoſit a white heavy precipitate *(a)*, which when carefully lixiviated, is *pure oxyd of biſmuth*. Add all the liquors together, and concentrate them by evaporation to one half of their bulk; then drop in a ſtrong ſolution of muriated ammonia, as long as any precipitate takes place; decant the ſupernatant fluid as accurately as poſſible, and, without waſhing the precipitate, digeſt it for ſome time with moderately ſtrong nitric acid; the undiſſolved part of the precipitate being ſeparated, waſhed, and dried, is *pure muriat of ſilver (b)*. The nitrous ſolution is now to be diluted with a large quantity of cold water, and a precipitate of oxyd of biſmuth *(c)* will be thrown down. The diluted nitrous ſolution being mixed with the other liquor, the whole muſt be evaporated, till a conſiderable number of cryſtals are depoſited; at this time, the addition of ſulphuric acid will occaſion a white depoſit of *ſulphat of lead (d)*. The remainder of the ſolution is now to be ſuperſaturated with cauſtic liquid ammonia, by which the *iron* will be depoſited in the ſtate of brown oxyd, *(e)*, and the copper will form with the ammonia a blue ſolution; this being ſaturated ſlightly to exceſs with ſulphuric acid, will depoſit the *copper (f)* upon a piece of clean iron. The reſidue of the ore that was undiſſolved by nitric acid, being weighed, and expoſed to a low red heat, will give out its *ſulphur (g)*, the quantity of which may be eſtimated with conſiderable accuracy by the loſs of weight. It is now finally to be digeſted with ten times its weight of boiling muriatic acid, by which ſome oxyd of lead will be taken up; and this, by evaporation and the addition of ſulphuric acid, may be procured in the ſtate of ſulphated lead *(h)*. The reſidue being waſhed and dried is the ſtony gangue of the ore *(i)*.

Hence the ore will be decompoſed into

Oxyd of biſmuth *(a)* and *(c)*,
Muriated ſilver *(b)*,
Sulphated lead *(d)* and *(h)*,
Oxyd of iron *(e)*,
Metallic copper *(f)*,
Sulphur *(g)*,
Stony matrix *(i)*.

§ 3. *Reduction of Biſmuth Ores.*

The ſeparation of this metal from the ſubſtances with which it is found united in the mine, and the reduction of it to a marketable ſtate, is perhaps the eaſieſt of all the metallurgical proceſſes, on account of the ready fuſibility of biſmuth, and its being found for the moſt part in the metallic ſtate. The following were the methods practiſed in the time of Agricola (De Re Metallica, p. 349.) A round pit, two or three feet wide, was lined with well rammed clay and charcoal, and covered with billet wood, upon which were laid alternate ſtrata of ore and wood. When the pile was thus built to a ſufficient height, fire was applied to the top, and the biſmuth, as the heat penetrated through the maſs, became melted, and trickled down into the hole beneath, where it collected in an irregular maſs; being then withdrawn, and broken into pieces, it was remelted in iron or earthen pots, ſeparated from the impurities that floated on its ſurface, and finally caſt into flat cakes, or loaves, for ſale. Another method was to divide a large pine tree longitudinally, and cut out the central part of the wood, thus forming it into a gutter; this being placed ſomewhat inclined, the ore was laid in the upper end, on a bed of chips and ſmall wood, ſufficient, when ſet on fire, to liquify the biſmuth, which flowing down, was collected in a hole or veſſel placed at the end of the trough.

The ſcarcity of wood, has, however, put an end to theſe rude and extravagant methods; and the ores of biſmuth are now reduced in a common reverberatory furnace, the bed of which is lined with charcoal, whence the melted metal is removed in iron ladles, and caſt into maſſes weighing twenty or thirty pounds, in which ſtate it is brought to market.

§ 4. *External Characters and Phyſical Properties.*

Biſmuth is a white metal with a reddiſh yellow tinge; is conſiderably hard, but brittle, exhibiting a broad foliated fracture; has a bright, almoſt ſpecular metallic luſtre; and is ſomewhat ſonorous, when ſtruck. Though brittle, it may be compreſſed very conſiderably by judicious hammering, and therefore varies greatly in its ſpecific gravity. According to Muſchenbroeck, its ſp. gr. when freſh melted, is = 8.716; but when laminated, is = 9.638. Bergman fixes its gravity at 9.67; and other authors make it as high as 9.8, or even 10. The laminæ, of which this metal is compoſed, have but little adheſion to each other; hence the primitive form of its cryſtals, which is that of a regular octahedron, may very eaſily be aſcertained by diſſection. It is fuſible at 460° Fahr., and may be poured into a paper cone without burning it. If, after it has begun to ſolidify, the fluid part is poured off, a groupe of cryſtals is obtained in tubes, or rectangular volutes. When expoſed in cloſe veſſels to a violent heat, it ſublimes and attaches itſelf to the cooler part of the apparatus in the form of brilliant plates.

§ 5. *Oxyds of Biſmuth.*

The combined action of air and moiſture upon biſmuth, at the uſual temperature, is very ſlight; it becomes covered with a reddiſh grey ſuperficial tarniſh, and afterwards appears to undergo no further change. At a melting heat, it ſhortly becomes covered with an irideſcent film, and by expoſing freſh ſubſtances to the air, is wholly converted into a yellowiſh brown oxyd, weighing about $\frac{1}{12}$ more than the original metal. This oxyd melts into a yellow glaſs at a moderate red heat, and ſoon penetrates through the moſt compact earthen crucibles, though not quite ſo eaſily as glaſs of lead does. When biſmuth is expoſed to a ſtrong heat, with free acceſs of air, it burns with a faint blue flame, and throws up at the ſame time a copious white oxyd, which was formerly called *flowers of biſmuth*; towards the end of the proceſs the oxyd acquires ſomewhat of a yellowiſh tinge, probably on account of a ſmall portion of ſulphur, or other impurities. The glaſs, or vitreous oxyd of biſmuth, is a very active flux for earths and the more difficultly fuſible oxyds; on account, however, of the ſuperior cheapneſs and efficacy of lead, it is ſeldom uſed for this purpoſe.

§ 6. *Action of Acids on Biſmuth.*

1. Concentrated ſulphuric acid has no action on biſmuth, except when boiling hot; in this ſtate, it is rapidly decompoſed, giving out ſulphureous acid gas, and reducing the metal to a white pulverulent oxyd; by a low red heat the decompoſition is ſo complete, that a quantity of actual ſulphur is volatilized. The white maſs being waſhed with a little warm water, parts with nearly the whole of its acid, holding a ſmall portion of biſmuth in ſolution: this fluid by careful evaporation, depoſits minute ſoft cryſtalline needles of ſulphat of biſmuth, from which, by the mere affuſion of water, the metal may be ſeparated in the form of white oxyd. The ſulphated oxyd, produced in the firſt

part

part of the process, is remarkably more difficult of reduction than any of the pure oxyds of § 5.

2. Sulphureous acid is incapable of attacking metallic bismuth, but readily combines with its oxyd, forming a white insoluble sulphite of a sulphureous flavour, reducible into metallic globules before the blowpipe, decomposable with effervescence by sulphuric acid, and when distilled, giving out its acid, a mass of pure white oxyd remaining behind.

3. Nitric acid acts upon bismuth in a remarkably violent manner. If the metal is in powder, and the acid somewhat concentrated, at the instant of their mixture, even without the assistance of heat, a rapid decomposition of the acid takes place, accompanied with the production of nitrous gas, azot, and sometimes of ammonia; and the bismuth is converted into a white oxyd. If the acid is previously diluted with an equal weight of water, and the bismuth is added gradually in small pieces, the decomposition goes on more quietly, the metal is dissolved in proportion as it oxydates, and the acid may be made to take up nearly half its weight of bismuth. By cautiously adding to this solution an equal bulk of distilled water (each portion being well mixed with the whole mass by stirring, before the addition of a succeeding portion), a black pulverulent precipitate takes place, which has not yet been analysed, but has been taken for sulphur or charcoal. If the acid made use of is still more dilute, consisting, for example, of four parts of water, and one of nitric acid, the black matter is not dissolved. Nitrat of bismuth, when thus purified, is clear and colourless, and by gentle evaporation crystallizes in the form of flattened rhomboids, or compressed tetrahedral prisms terminated by three sided pyramids. This salt, when exposed to a dry air, is considerably efflorescent; but in a humid air, becomes covered with a white, somewhat moist coating of oxyd. When thrown on hot coals, it detonates feebly, giving out faint red sparks, and leaves behind a greenish yellow oxyd of difficult reduction. If a crystal of nitrated bismuth is thrown into some pure water, it immediately becomes covered with a white opaque oxyd; but the decomposition of this salt is more striking, if a solution of it is made use of. For this purpose, let a jar be nearly filled with clear rain water, and drop into it nitrat of bismuth as long as any precipitation takes place, then mix the whole by agitation, and let it stand for an hour to settle. The bottom of the vessel will now be covered with a fine heavy powder of a dazzling white, which, when repeatedly washed and dried, is pure oxyd of bismuth, formerly called *magistery of bismuth*, and well known as a cosmetic under the name of *blanc de fard*. This preparation, if made with pure nitric acid, and well washed, is of a dead white; but if a little muriatic acid is mixed with the nitric, and the precipitate is washed with a *small* portion of *cold* water, it will be in the form of minute glittering scales with a beautiful pearly lustre, and is then called by the French *blanc de perles*. In both states it is extensively employed, particularly by the French ladies for whitening the skin, but is subject to turn grey, brown, and even black, by any hydrogenous and sulphureous vapours. This oxyd of bismuth does not appear to retain any nitric acid; and its component parts are fixed by Bergman at 77 of metal, and 23 of oxygen; but, by the more accurate experiments of Klaproth, its contents are ascertained to be 81 of metal to 19 of oxygen. Nitrated bismuth is not, however, totally decomposable by water; for the clear fluid, that is separated by filtration from the oxyd, may still be made to yield a precipitate by a carbonated alkali, muriatic acid, or muriated ammonia. Klaproth found (Analyt. Ess. vol. i. p. 557), that 100 grains of bismuth, dissolved in nitric acid, yielded with water 88 grains of oxyd, and 35 more were obtained from the diluted solution, by the action of muriatic acid added in drops as long as any precipitate ensued. This oxyd is very easily reduced by fusion in a covered crucible, with a little nitre and tartar.

4. Bismuth in the metallic state is acted upon with difficulty by muriatic acid, even when it is concentrated and assisted by heat. During the digestion, a small quantity of fetid hydrogen gas is given out; and, by slow evaporation, small deliquescent needle-shaped crystals are deposited of muriat of bismuth. This salt, however, may be obtained in much greater quantity, and more easily, by substituting the oxyd of bismuth for the pure metal. If the saline mass, which remains behind after evaporation to dryness, is distilled in a glass retort, nearly the whole of it comes over at a moderate heat, and concretes into a soft white mass, called formerly *butter of bismuth*. Butter of bismuth, like butter of antimony, is intensely caustic to the taste, deliquiates in a moist air, and when dropped into water, is decomposed, a fine white oxyd being precipitated.

5. Liquid oxy-muriatic acid acts upon metallic bismuth with considerably more energy than muriatic acid does: the metal is oxydated without the disengagement of hydrogen, and the result is muriat of bismuth. It is probable, that by substituting the oxyd of bismuth for the pure metal, oxymuriat of bismuth might be produced: this, however, is not as yet confirmed by experiment. If bismuth, previously reduced to fine powder, is poured into oxymuriatic acid gas, the metal is instantly ignited and oxydated, and falls in a shower of fire to the bottom of the vessel.

6. Tincture of galls, or gallic acid, precipitates bismuth of a greenish colour from its solution, as prussiated potash does of a yellowish colour.

7. There is scarcely any thing known concerning the other bismuthic salts. They are formed by digesting the yellow oxyd in the various acids that have not been already mentioned, and are for the most part but little soluble in water. The proportions of their ingredients have not been ascertained with any accuracy, nor are they applied to any use.

§ 7. *Action of the Alkalies and Earths on Bismuth.*

The fixed alkalies have no effect on metallic bismuth, but unite both in the humid and dry way with its oxyd. Ammonia is said to acquire a greenish yellow colour by digestion with the metal when pulverized, and certainly dissolves its oxyd in considerable proportion. The action of the earths upon bismuth is unknown, except that silex and oxyd of bismuth combine by fusion into a clear greenish yellow glass.

§ 8. *Action of the Neutral Salts on Bismuth.*

None of the neutral salts in solution appear to exert any affinity on bismuth or its oxyds; but, in a dry heat, many of them are decomposed by it.

Nitre, being mixed with pulverized bismuth, and projected into a red hot crucible, is decomposed with a slight detonation; the bismuth becomes oxydated, and then unites in part with the alkaline base of the nitre.

Muriat of soda, according to Pott, is in some degree decomposable by metallic bismuth. This fact, however, is not confirmed by later chemists; and it is probable, that the salt, which Pott made use of, was not free from muriated magnesia, and that the bismuth was partly oxydated.

Muriated ammonia is totally decomposable by oxyd of bismuth. On the first impression of the fire, very pure ammoniacal gas is disengaged; and by a low red heat, the muriated bismuth rises in the form of a thick white vapour, which concretes, in the receiver and neck of the retort, into *butter of bismuth*; if the oxyd of bismuth is in very small proportion

proportion to the muriat of ammonia, the greater part of this salt rises entire, but mixed with a little muriat of bismuth, forming the *bismuthic flowers of sal-ammoniac* of the old chemists. When these flowers are thrown into water, the bismuth is deposited in the form of a white oxyd.

Oxymuriat of potash mingled with powdered bismuth, and projected into a hot crucible, is decomposed with great violence, and the metal is completely oxydated. A mixture of three parts of this salt, and one of bismuth, produces a flash and a loud detonation, if laid on an anvil and struck smartly with a hammer.

§ 9. *Bismuth with combustible Bodies.*

If one part of sulphur, and four of bismuth, are triturated together, and afterwards exposed to a full red heat in a covered crucible, a brilliant striated metallic mass of sulphuret of bismuth is obtained, similar in its properties to the native sulphuret mentioned in § 1. It may be made to crystallize, by allowing it to cool very gradually, and pouring off the fluid part as soon as the surface is crusted over. The cavity thus formed will be found to be lined with long tetrahedral prisms crossing each other, and occasionally of a deep iridescent blue and red colour, forming groupes of exquisite beauty. The sulphuret of bismuth is much less fusible than the pure metal; it parts with nearly the whole of its sulphur by long roasting, and is decomposable by nitric acid, which dissolves the bismuth without touching the sulphur.

Sulphuretted hydrogen converts the white oxyd of bismuth into a black mass, of which neither the properties nor proportions have been ascertained.

Phosphorus has very little affinity for this metal. Pelletier tried in vain by several methods to prepare phosphuret of bismuth. In some of his experiments, the metallic globule, when red hot, gave out a faint lambent flame, but exhibited no other proof of combination with phosphorus. Fat oils, by the assistance of heat, dissolve the oxyd of bismuth, and form with it a thick tenacious plaister.

§ 10. *Alloys of Bismuth.*

Bismuth appears to increase remarkably the fusibility of all the metallic compounds into which it enters; but it is to be lamented, that we are greatly in want of accurate experiments on this interesting branch of inquiry.

1. *Bismuth and Gold.* See GOLD.
2. *Bismuth and Silver.* See SILVER.
3. *Bismuth and Iron.* See IRON.
4. *Bismuth and Copper.* See COPPER.
5. *Bismuth and lead.* Equal parts of these two metals unite easily by simple fusion, forming an alloy of a brilliant white colour, considerably harder than lead, and, though not ductile, more malleable than pure bismuth. By diminishing the proportion of bismuth, the malleability of the mass is increased, without sensibly impairing its fusibility, hardness, and lustre.
6. *Bismuth and tin.* A small quantity of bismuth increases the hardness and brilliancy of tin, without rendering it less ductile; hence the best foils for glass mirrors are made of this alloy, as also are some kinds of pewter.

Bismuth with lead and tin. Fusible metal. Plumbers' solder. The fusibility of the alloys of bismuth is in no instance so remarkable as in that discovered by Newton, and thence commonly called Newton's fusible metal. It is made by melting together eight parts of bismuth, five of lead, and three of tin. The mass is very brittle, and when broken exhibits a porcellanous appearance, with little or no lustre; it is so fusible as to become liquid when held on a piece of stiff paper over a candle, without scorching the paper; and becomes as fluid as quicksilver in boiling water. If the bismuth is reduced to one part, the proportions of lead and tin remaining the same, the alloy is plumbers' solder; and it differs from the preceding in being somewhat less fusible and considerably malleable.

7. *Bismuth and Mercury.* See MERCURY.
8. *Bismuth and Iron.* See IRON.

§ 11. *Medical Use of Bismuth.*

The magistery, or white oxyd, is the only form of bismuth which is employed medicinally. It is prescribed with success in spasmodic affections of the stomach. Gren. System. Handbuch, v. iii. p. 292. Leonhardi's Macquer. art. Wismuth. Fourcroy Syst. des Connaiss. Chimiques, vol. v. Beaumé Chem. experimentale, vol. ii.

BISNAGUR, in *Geography*, an ancient kingdom of Hindoostan, called Narsinga, from the name of one of its rajahs, or sovereigns, was formerly the most extensive, powerful, and rich monarchy in the Indies, and comprehended almost all the countries in the peninsula south of the 16th parallel, or the whole of the Carnatic and some other kingdoms. Some have distinguished between the kingdoms of Bisnagur and Narsinga, but it is not easy to determine, whether they were two successive, or two co-existing kingdoms. It appears, probable, however, that in the 16th century Bisnagur included the greatest part of the peninsula. The inhabitants of this ancient empire, which is said to have continued 800 years, were Pagans, and denominated Badagus; and spoke the Tamul, or Damul language, which is the same with the Malabaric; but the Badagun was used at court. According to the Portuguese writers, the kingdom of Charnataka had no sovereign prince till the year 1200, and the first was Boka, a shepherd, who styled himself rau or rajah, that is emperor; which title has descended to his successors. Boka, it is said, in memory of a victory which he obtained over the king of Delhi, built the famous city of Visianagur, corruptly called Bisnagur. The crown continued in his line till it was usurped by Narsinga, from whom this kingdom took its name, as it did that of Bisnagur from the city. The king of Bisnagur was a powerful prince about the year 1520; and about the year 1565 the capital was resorted to by merchants from all parts, as being the greatest, if not the only mart for diamonds in the east; and its riches were equal to its extent. At this time it was invaded by the king of Visiapour, and other northern princes of the Deccan; and in 1567 the rajah, or king, retired, with his court, first to Penuconda, and at a subsequent period, or about 1597, its existing sovereign removed to Kandegheri, or Chandegheri, an inland city, strong by nature and fortified by art, so as to be deemed impregnable. About the middle of the 17th century, this large monarchy was again invaded and utterly destroyed, by Adel Shah, king of Visiapour, who formed a league with the king of Golconda for this purpose. The unfortunate rajah fled into the mountains, where he remained in 1667. About 20 years after, the kingdom of Bisnagur fell under the power of the Moguls, by the conquest which Aurungzebe made of the kingdoms of Visiapour and Golconda.

BISNAGUR, rather BIJINAGUR, sometimes written BEEJANUGGUR, the capital of the above kingdom, is situated on the south bank of the Toombuddra river, and according to M. Bussy's map, distant about 30 miles S. E. or S. S E. from Bancapour. Ferishta says, that it was founded by Belaldeo, king of the Carnatic in 1344, and was thus placed in order to guard the northern frontier of his empire. See the preceding article. This city was visited by Cæsar Frederick in 1565, and was then a very large city; its circuit, as he says, being 24 miles, and containing within it a number of hills and pagodas. He reckons it 8 days' journey,

journey, or about 140 geographical miles, from Goa. Its ruins are extenſive, ſeveral rugged hills and rocks being covered with temples that ſtill appear beautiful; the circumference ſeems to be about eight miles. N. lat. 15° 15′. E. long. 76° 34′. Beejanuggur lies directly oppoſite to Annagoondy, ſeated about 2 miles from the north bank of the river Toombuddra, which is at preſent the principal town of a ſmall diſtrict of the ſame name; one being the Jaghire, or eſtate, the other the place of reſidence of the deſcendant of the ancient kings of Beejanuggur, who, about 2½ centuries ago, ruled the greateſt part, if not the whole, of the peninſula, under the title of the empire, or kingdom of Canara. Lieutenant Emmit, an Engliſh officer, who examined the ruins of Beejanuggur, traced between immenſe piles of rocks, crowned with pagodas, ſeveral ſtreets from 30 to 45 yards wide, ſome of which now produce fine rice. One ſtreet extends about N. E. and S. W. half a mile, and is about 35 yards broad, having colonnades of ſtone on each ſide, and a very large pagoda at the S. W. end, in perfect repair. On the weſt ſide of the ſtreet is a large mango grove, which is bounded by the Toombuddra. Many ſtreams flow through theſe veins, which have been formerly employed to fill a great number of canals. Comlapour fort is diſtant about half a mile, and ſurrounded with hills through which the road winds in aſcents and deſcents, paved with large ſtones.

BISNEE, a town of Aſia, in the country of Bootan, 116 miles S. E. of Taſſaſudon, and 188 N. E. of Moorſhedabad.

BISNOW, or Bischnou, a ſect among the Indian banians, or caſt of merchants. The banian ſect conſiſts of two leſſer ones; that of *biſnow*, and that of *ſamarath*. The followers of the former hold one God, whom they call *ram-ram*, and allow of no lieutenants, or deputy-gods, as is done by thoſe of the ſect *ſamarath*; but they allow their god a wife, and have idols, which they dreſs up with gold chains, and collars of pearl and precious ſtones, and pay them worſhip, by ſinging hymns in their temples, and dancing before them to the ſound of flageolets and kettle-drums.

In this ſect, the wives do not burn themſelves after their huſbands' death, as is practiſed by thoſe of the *ſamarath* ſect; but content themſelves with a perpetual widowhood.

BISOMUM, Disomum, compounded of *bis*, *twice*, and the Greek σωμα, *body*, or *aſhes of a body*, in *Antiquity*, a tomb for two bodies, or the aſhes of two. The ancients frequently buried two, three, or four bodies in the ſame ſepulchre, diſpoſed a-ſide of each other; for it was held an impiety to lay one a-top of another. Hence the ſepulchres of the primitive Chriſtians had the words *biſomi*, *triſomi*, *quadriſomi*, &c. inſcribed on them, to indicate the number of bodies depoſited in them. Du-Cange.

BISON, in *Entomology*, a ſpecies of Scarabæus, with the anterior part of the thorax pointed; and two lunated horns on the head. Inhabits Spain, and the ſouthern parts of France. Colour black. The female has on the anterior margin of the thorax an elevated or carinated edge.

Bison, in *Zoology*. See Bos Ferus, or *Wild-ox*.

BISPINOSA, in *Entomology*, a ſpecies of Mantis, with a roundiſh thorax, bidentated in front; wing-caſes very ſhort, and bordered with yellow. Fabricius.

Bispinosa, a ſpecies of Cicada (*Mannifera, Tettigonia,*) It is of a large ſize, and inhabits the iſland of Sumatra. The colour is brown, with a ſingle ſpine on each ſide of the thorax; wings duſky, with a ſtreak of black ſpots. Fabricius Mantiſ.

BISPINOSUS, a ſpecies of Cerambyx (*Stenocorus*) that inhabits South America. Thorax unarmed, and ſlightly tuberculated; wing-caſes bidentated; joints of the antennæ armed with two ſpines; and the body teſtaceous. Fabricius.

Bispinosus, a ſpecies of Carabus that inhabits Europe. This is of a black colour; poſterior part of the thorax truncated; anterior ſhanks with two ſpines. Lina-Leſk. Muſ.

Bispinosus, a ſpecies of Tabanus, found about Goettingen, and deſcribed by Fabricius. The colour is brown; abdomen ferruginous, and black at the baſe, with two ſpines on the ſcutel.

BISQUET. See Bisket.

BISSA, in *Geography*, a town of Servia on the Danube, 16 miles S. S. E. of Orſova.

BISSACRAMENTALES, in *Eccleſiaſtical Hiſtory*, a denomination given by ſome Romiſh writers to Proteſtants, on account of their only holding two ſacraments, viz. baptiſm and the ſupper.

BISSAG, in *Geography*, a town of Croatia, 16 miles N. E. of Agram.

BISSAGOS, the name of a cluſter of iſlands and ſhoals, lying off the weſt coaſt of Africa, between the mouths of the rivers Rio Grande and Cacheo, and between about 10° 30′ and 11° 30′ N. lat. and 15° 10′ and 17° W. long. The principal of theſe iſlands, and that which lies neareſt the coaſt is Boolam, or Bulam, which ſee. Each of the inhabited iſlands is governed by a chief, who aſſumes the title and power of a king. All theſe petty monarchs are independent, and frequently at war with each other, which they carry on by means of canoes, capable of containing from 25 to 40 men, with their proviſions, and alſo their arms, which are ſabers, and bows and arrows. The negroes of theſe iſlands are tall, ſtrong, and healthy, though they live only on fiſh, nuts, and palm-oil; chuſing rather to ſell the rice, millet, and other produce of the earth to the Europeans, than to reſtrain their paſſion for trinkets and ornaments. They are idolaters, and are ſaid to be ſavage in their diſpoſition, not only to ſtrangers, but to one another, when they happen to quarrel, which is frequently the caſe; and if they are diſappointed in gratifying their revenge, they will drown, or ferociouſly ſtab themſelves.

BISSAO, an iſland on the weſt coaſt of Africa, ſeparated from the continent by a channel, which connects two bays of the ſea, within the Biſſagos iſlands, between 11° 15′ and 11° 39′ N. lat. and 15° 11′ and 16° 30′ W. long. Both the Portugueſe and French began to trade at an early period with this iſland; the former have a fort upon it, and the latter a factory. The Dutch have in vain attempted to obtain a ſettlement. The iſland is 35 or 40 miles in circumference, and riſes from the ſea, of which it has an agreeable proſpect, by an eaſy aſcent to an eminence in the centre of the iſland. Its ſurface is hilly, and the hills are ſeparated by beautiful and fertile vales, which are watered by ſmall rivulets. The whole, a few groves of palm-trees excepted, is in a ſtate of cultivation, and produces, beſides oranges, mangoes, and bananas, and other fruits afforded by the warm climates, wheat and maize, which grow luxuriantly, and reſemble, by the ſize to which the ſtems riſe, reeds or bamboos. Their cattle are likewiſe of an extraordinary ſize; and are amply ſupplied with both milk and wine. The importation of ſwine is prohibited, and the ſoil does not ſuit the rearing of horſes. The inhabitants, who are in a ſtate of almoſt perpetual conteſt with thoſe of the neighbouring iſlands and continent, live in cottages diſperſed over the iſland, which bears no trace of a town, except where the French

French and Portuguese have established themselves. The dress of the married women consists of a cotton girdle, and bracelets of glass, coral, and copper; but the virgins are altogether naked; and those of high quality mark their bodies with hideous figures of snakes and other reptiles. The princess of the island is only distinguished from other females by the elegance of these paintings, and the richness of her bracelets. The dress of the men of all ranks is merely a skin fixed before and behind to their girdle. One singular ornament is a large iron ring, upon which they ring changes with a piece of iron, so as to converse as freely with their castanets as if they used the most polished language. This artificial language is used only by persons of rank and fashion. All the Bissaons are idolaters, but their system of religion is very confused and unintelligible. Besides their chief idol, called "China," every one creates a divinity according to his own fancy; trees are held sacred by them, and, if they do not adore them as gods, they worship them as the residence of some divinity. Their government is despotic, the will of the emperor being the law to his people; at his death all his women and slaves are sacrificed and buried near their master, in order to attend him in the other world. Although they are at almost perpetual war with some of their neighbours, they have among themselves no civil discord. Before the emperor resolves to invade any adjacent territories, he orders the "bonbalon" to be sounded, which is the general signal to arms, on which all persons in the pay of government assemble at a fixed place, and embark on board their canoes, each of which carries about thirty men, and the whole fleet consists of about 30 canoes. Before the fleet sails, they offer sacrifices in great number to their gods, which are made of wood, and the favourable answer of the priests, when they consult these deities, ensures their success. When they attack any towns or villages, they carry off the inhabitants, and every article of value, and divide the booty between the emperor and those that have been engaged. The slaves are sold to the Europeans, except such as are of quality or fortune, who are restored to their friends on condition of their sending a number of slaves in their room. The emperor is said to allow free commercial intercourse with all strangers. The Portuguese demolished their fort on the island in 1703. See Balontes, Bissagos, and Bulam.

BISSECTION, in *Geometry*, the division of any quantity into two equal parts, otherwise called *bipartition*, which see. See also Division, &c.

BISSENDORF, in *Geography*, a town of Germany, in the circle of Westphalia, and bishopric of Osnabruck, 5 miles S. E. of Osnabruck.

BISSENPOUR, a small district of Bengal in the East Indies, which is governed by a Bramin family of the tribe of Rajpoots, and which has uniformly preserved its independence. In this district, it is said, the purity and equity of the political system of the Indians are found unadulterated. By the singular situation of this country, its inhabitants have been enabled to maintain their primitive happiness, and the gentleness of their character; and they have been secured from the danger of being conquered, or of imbruing their hands in the blood of their fellow-creatures. Nature has surrounded them with water, and they only need to open the sluices of their rivers in order to inundate the whole country. The armies that have been sent to subdue them have been so frequently drowned, that the plan of enslaving them has been laid aside; and the projectors have thought proper to content themselves with an appearance of submission. In Bissenpour, liberty and property are sacred; robbery is unknown; and every stranger, who enters this territory is under the protection of the laws, which provide for his security. The guides, to whose conduct he is committed, become responsible for his person and effects; whilst he remains, he is maintained and conveyed with his merchandise at the expence of the state, unless he expresses his desire to stay longer than three days in the same place; and should this be the case, he is obliged to live at his own charge. In this state it is said, probity and honesty are so prevalent, that if any one find a purse, or any other article of value, he hangs it upon the first tree he finds, and informs the nearest guard, who gives notice of it to the public by beat of drum. Out of about 330,000l. annually received at an average by the government, without injury to agriculture or trade, what is not wanted to defray the unavoidable expences of the state, is laid out in improvements. The rajah is enabled to engage in these liberal employments, as he pays the Moguls only such tribute, and at such times, as he thinks proper. Raynal's Hist. Settl. East and West Ind. vol. i. p. 415.

BISSENPRAAG, a town of Asia in the country of Sirinagur, situated near the base of a mountain, on which stands the famous temple of Buddreenaat. It is a place of some importance, as being the residence of the pundits and principal Hindoos of Buddreenaat. Here they hold their durbahs, exercise their laws, and the duties of their religion, in the greatest state of security from foreign intruders, and can at any time seclude themselves from the rest of the world, by a removal of the "joalahs," or rope bridges, which form the communication across the Aluknundra. This river receives at Bissenpraag another river, proceeding from the eastward as large as itself, called "Dood Ganga," or the Milk river, and also "Dhoulee." Near its junction with the Aluknundra, it runs between two villages, called "Gurra" and "Nitty." The town consists of about 800 houses, and is a place of some trade; the inhabitants are all Hindoos. Asiat. Res. vol. vi. p. 346.

BISSET, Charles, in *Biography*, studied medicine several years at Edinburgh, as he informs us in his Essay on the Medical Constitution of Great Britain, published in 1762, and was then promoted to be second surgeon to the hospital in Jamaica, where he continued from 1740 to 1745, when he returned to England, and purchasing a commission in the army, he served as lieutenant and engineer in Flanders until the peace in 1748. He now resumed the practice of surgery, and settled at Skelton in Cleveland, Yorkshire, and soon after published "A Treatise on the Scurvy," 1755, 8vo. He had before, viz. in 1751, published "An Essay on the Theory and Construction of Fortifications." In 1765 he obtained a diploma from the university of St. Andrew's, constituting him doctor in medicine. He died at Knayton near Thirsk, in May 1791, in the 75th year of his age. New Gen. Biog. Dict.

BISSEXTIALIS, or Bissextialis *olla*, an ancient measure or vessel, containing twelve ounces, or two Sextaries.

BISSEXTILE, or Leap-year, in *Chronology*, a year consisting of 366 days, happening once each four years, by reason of the addition of a day in the month of February, to recover the six hours which the sun spends in his course each year, beyond the 365 days ordinarily allowed for it.

The day thus added, is also called bissextile; Cæsar having appointed it to be introduced by reckoning the 24th of February twice; and as this day, in the old account, was the same as the sixth of the calends of March, which had been long celebrated among the Romans on account of the expulsion of Tarquin, it was called "bis sextas calendas Martii;"

Martii;" and from hence we have derived the name biſſextile.

By the ſtatute *de anno biſſextile*, 21 Hen. III. to prevent miſunderſtandings, the intercalary day, and that next before it, are to be accounted as one day.

The aſtronomers concerned in reforming the calendar, by order of pope Gregory XIII. in 1582, obſerving, that the biſſextile in four years added 44 minutes more than the ſun ſpent in returning to the ſame point of the zodiac; and computing that theſe ſupernumerary minutes in 133 years would form a day; to prevent any changes being thus inſenſibly introduced into the ſeaſons, directed, that, in the courſe of 400 years, there ſhould be three biſſextiles retrenched; ſo that every centeſimal year, which, according to the Julian account, is biſſextile, or leap-year, is a common year in the Gregorian account, unleſs the number of centuries can be divided by 4, without a remainder. Thus 1600 and 2000 are biſſextile; but 1700, 1800, and 1900 are common.

The Gregorian computation was received in moſt foreign countries ever ſince the reforming of the calendar; and by act of parliament, paſſed anno 1751, it commenced in all the dominions under the crown of Great Britain, in the year following, ordering that the natural day following the ſecond of September, ſhould be accounted the fourteenth; omitting the intermediate eleven days of the common calendar. See CALENDAR.

BISSINGEN, in *Geography*, a town of Germany, in the circle of Swabia, and county of Pattingen Wallerſtin, 4 miles S. S. W. of Haarburg.

BISSOOLY, a principal fort of Hindooſtan, lying at or near the entrance of the hills, 42 coſſes S. E. from Jummoo. Major Rennell places it in his map on the north bank of the Rauvee, 6 or 7 coſſes above Kullanore, or 41½ above Lahore, or, in other words, about 59 geographical miles E. 30° N. from Lahore. N. lat. 32° 30′. E. long. 75°.

BISSOWIE, a town of Hindooſtan, in the country of Oude, and circar of Rohilcund, 25 miles weſt of Bereilly, and 85 E. S. E. of Delhi.

BISTAM, a ſmall city of Perſia, in the province of Comis, on the north of the Great Salt Deſert, rarely viſited by travellers. N. lat 35° 30′. E. long. 54° 30′.

BISTER, a town of Swiſſerland, in the Upper Vallais, near the ſouth bank of the Rhone. N. lat. 46° 19′. E. long. 7° 52′.

BISTI, a ſpecies of Perſian money, valued at ſixteen or eighteen French *deniers*. Some repreſent the biſti as an ancient ſilver coin; others, as Chardin, make it only a money of account, and call it dinar biſti.

BISTONES, in *Ancient Geography*, the name of a people who inhabited that part of Thrace, which was bounded on the north by mount Rhodope, on the eaſt by the Hebrus, on the weſt by the Neſſus, and on the ſouth by the Ægean ſea. Its capital was Tinda. Theſe people were ſubdued firſt by the Macedonians, and at length by the Romans. Xerxes, according to Herodotus, traverſed their country in marching againſt Greece. Hence "Biſtonius tyrannus" is uſed by Lucan to denote Diomedes, king of Thrace, who fed his horſes with human fleſh; and "Biſtonius turbo;" expreſſing a wind blowing from Thrace.

BISTONIS, a lake on the ſouthern coaſt of Thrace, N. E. of Abdera.

BISTORT, or SNAKEWEED, in *Botany*. See POLYGONUM.

BISTORY, or BISTOURY, in *Surgery*, is a cutting inſtrument, formed like a ſmall knife. It may be either ſtraight or curved, double-edged or with a ſingle edge, ſharp pointed, round pointed, or with a probe point, &c. Sometimes it is made to ſhut within a handle; at other times the blade is fixed and immoveable. For particular purpoſes, the blade is concealed, ſo as to project only at the moment when the inſtrument is uſed by the ſurgeon; on which account it is called by the French *biſtouri caché*. On ſome occaſions, it is found convenient to employ a [illegible], at the ſame time we introduce the biſtory: for example, when it is intended to paſs the cutting inſtrument along a narrow ſinus, or under the prepuce, up to a certain ſpot before we make any inciſion, (ſee the articles PHYMOSIS, and SINUS); but wherever there is room for the introduction of a fore-finger, that mode is preferred by modern ſurgeons as a guide to the biſtory, being much more convenient and ſecure than any artificial director. The preciſe form of a biſtory muſt be regulated according to the nature of the operation required, and the end to be obtained. See the article SCALPEL, and conſult the engravings of chirurgical inſtruments attached to this Cyclopædia.

BISTRA, in *Geography*, a town of Bohemia, in the circle of Chrudim, 6 miles S. S. E. of Politzka.

BISTRAIA, a town of Ruſſian Tartary, on the weſt ſide of the Donetz, 70 miles N. N. E. of Azof.—Alſo, a river of Ruſſian Tartary, which runs into the Donetz, 64 miles N. E. of Azof.

BISTRE, among *Painters*, a compoſition made of the moſt gloſſy and higheſt burnt ſoot, pulverized, and paſſed through a fine ſieve, then baked in a little gum-water, and made into cakes: or it is the burnt oil, extracted from the ſoot of wood. It is a brown tranſparent colour, and has much the ſame effect in water-painting, where alone it is uſed, as brown pink in oil.

The beſt is prepared from the ſoot of dry beech wood, by grinding it with urine or water, into a ſmooth paſte, and then diluting it with more water; after the groſſer ſubſtance has ſubſided, the liquor is poured off into another veſſel, and left to ſettle three or four days; the fine matter that remains is biſtre.

That the biſtre of our colour ſhops has been prepared by a proceſs of this kind, and not, as ſome have ſuſpected, by evaporating the infuſion of ſoot to an extract, may be preſumed, ſays Dr. Lewis (Com. Epiſt. Phil. Techn. p. 340.), both from its appearance and its qualities. He obſerves, that different parcels of biſtre differ conſiderably in their colour, on account, probably, of the different qualities of the ſoots from which they were made.

In the Handmaid to the Arts, vol. i. p. 126. we have the following recipe for preparing it. Put the ſoot of dry wood (of beech when it can be procured) into water, in the proportion of 2 pounds, to a gallon, and boil them half an hour. Then, after the fluid has ſtood ſome time to ſettle, but while yet hot, pour off the clearer part from the earthy ſediment at the bottom; and if on ſtanding longer it form another earthy ſediment, repeat the ſame method; but this ſhould be done only while the fluid remains hot. Evaporate the fluid to dryneſs; and what remains will be good biſtre, if the ſoot was of the proper kind. That which is good is tranſparent, when moiſtened with water, and of a warm, deep brown colour.

Inſtead of this, ſome uſe the hatches of a pen, with a little Indian ink, others red chalk, others black lead, &c. See WASHING.

BISTRIANKA, in *Geography*, a town of Ruſſian Tartary, on the ſouth ſide of the Don, 100 miles E. N. E. of Azof.

BISTRIATA, in *Entomology*, a ſpecies of CICADA (*Deflexa*)

flexa) that inhabits France. This is yellow, with two transverse bands of brown. Geoffroy.

BISTRICZ, or Bistritz, in *Geography*, a town of Transylvania, and capital of a county, to which it gives name, situate on the river Bistricz, which runs into the Samos, 4 miles S.W. of Kezovar. The town is 42 miles N.N.E. of Clausenburg, and 256 E. of Vienna. N. lat. 47° 33′. E. long. 25° 3′.

BISTRIGALIS, in *Entomology*, a species of Phalæna (*Pyralis*), with cinereous wings, with two ferruginous streaks, and a black dot. Inhabits Europe. Linnæus.

BISTRIGARIA, a species of Phalæna (*Geometra*), with cinereous wings, undulated, with two linear streaks. A native of Europe. Linn. &c.

BISTRIGATA, a species of Phalæna (*Geometra*). It is griseous, with two whitish streaks. Inhabits Europe.

BISTRITZA, in *Geography*, a town of European Turkey, in Moldavia, on a river of the same name, which runs into the Siret, 6 miles S. E. of Bakeu. The town is 20 miles S.W. of Jassy.—Also, a town of Walachia, 16 miles W.S.W. of Kimnik

BISTRIZ, a town of Moravia, in the circle of Brunn, 6 miles W.S.W. of Els.

BISTROFF, a town of France, in the department of the Moselle, and chief place of a canton in the district of Morhange, 4 miles N.N.E. of Morhange.

BISTRY, a town of Bohemia, in the circle of Konigingratz, 10 miles from Gitschin.

BISUGA, a river of Russian Tartary, which runs into the sea of Azof, 48 miles S.W. of Eiskoi.

BISULCATUS, in *Entomology*, a species of Curculio that inhabits Italy. This is black, with a cinereous border all round, and two furrows on the beak. Fabricius.

BISULCUS, a species of Ichneumon, of a black colour, with two impressed lines before; legs rufous; sting short. Linn. Mus. Lesk.

BITS, or Bitts *for Horses*, in the *Manege*, are pieces of iron of various figure and construction which, being placed in the horse's mouth, serve, by the assistance of the reins, to restrain or guide his motions.

The term *bitts*, or *bits*, is considered by some as originating from the horse's biting or champing them between the teeth when placed in his mouth; in the French language is used a term also of similar signification, *les mords*, which would seem to corroborate the above etymology of it:—another however, equally natural, presents itself in the common word *bit*, or *bitts*, that is *pieces* of iron; this apparatus being always made of one or more pieces of this metal.

The art of bitting horses may be said to consist in furnishing the mouth with the most proper mouth-pieces, &c. for obtaining from them an obedience to the will of the rider, and exacting a due performance of all the movements and restraints which may be desired, or at least which are dependent upon the operation of the reins. Rightly understood, and well administered, this art affords the power of communicating to the horse support and confidence, with greater ease and security to the rider. The misapplication of its rules, on the contrary, or an inattention to them, where the mouth is not totally insensible, will produce painful sensations to the horse, with disgust and rebellion, and to the rider uneasiness and perhaps danger.

It is to be lamented that the presumptuous opinions of the uninformed have been too much the guide of the public in their estimation and choice of the proper bits for horses, as also in too many other things respecting these useful animals, tending often to accumulate unnecessary suffering and misery upon them. The writers on this subject are few and unsatisfactory; we shall, however, except Mr. Berenger, whose work is a noble effort to emancipate this branch of science from barbarity and ignorance; and from him we shall take occasion to make some extracts in the sequel of this article. Here it will be proper to observe, that this author, by the term *bit*, has designated the curbed bit only, but we have ventured, for the sake of pursuing a more connected view of the subject, to include in this term any piece or pieces of metal placed in the horse's mouth, for the purposes of guidance or restraint.

In our account of the different kinds of bits, and their effects, we shall begin, for the sake of order, with the description of a bit of the most easy and simple construction possible, and then proceed to the most complicated.

A short iron rod, made rather wider than the mouth of the horse, and provided with a hook or ring at each extremity for fastening the reins to, affords us an instance perhaps of the greatest possible simplicity in the construction of a bit; and such a one only slightly curved forwards, to allow more liberty for the tongue, is at present in general use for the heavier kind of draft horses, the bearing rein being usually attached to it, passing over the hames of the collar.

A similar rod to the former, broken in two pieces, and connected by a joint in the middle, is the next in point of simplicity, and is in common use for horses of light draft; as in those employed for the curricle, coach, &c. and is attached by the bearing rein to the hook of the saddle, and this kind of bit is mostly termed with us a *bridon*.

The next in point of farther complication of parts, and which scarcely can be said to differ from the former, is the *common snaffle*. This is provided with two cross pieces, which rest against the lips or sides of the mouth; for as the snaffle is intended for the saddle horse, and the reins go to the hands, so the cross pieces are useful in preventing the bits from being drawn through the mouth, which precaution is not so necessary where the bits are affixed to the bearing rein. The bridon we may observe, is also made in general smaller than the snaffle, as well as without cross pieces.

The distinction, however, between a bridon and snaffle is insignificant and of little consequence; for on all occasions cross pieces are the most convenient; and it will be easily seen that the bridon is merely an imperfect snaffle, possessing no peculiar characters which can form a real distinction.

The term, also, when confined to this object is misapplied; for the French, from whom we have borrowed it, by *le bridon* nnderstand the snaffle and its rein, in opposition to *le bride*, by which they denote the *curbed bit* and reins.

In war, and on other occasions, the *bridon* was used as a lesser bridle, or bridle of reserve, in case of the failure of the former from any accident; and hence the origin of its name.

The number of parts of which the mouth-piece of the snaffle is composed, may be increased to any extent, as it may be made with one, two, or several joints; but as it is evident these additions will not essentially alter its properties or effects, it would be useless to pursue a distinct consideration of them.

But the condition of the snaffle admits of being so altered and changed by the variation of its figure, its substance, and its surface, as to acquire new properties and effects which will require particular attention; its gentleness or rigour will depend almost wholly on these conditions. A mouth-piece made of two entirely straight pieces will be more severe than when these are somewhat curved, as the curved bit is more apt to embrace and include the lips between it and the bars than the

the ſtraight one. A thin and ſlender bit or ſnaffle, it will be eaſily perceived, will reſt with more ſeverity and ſharpneſs upon the bars than a thick and obtuſe one; the former, therefore, or the ſharp bit, is employed more particularly for reſtraining ſuch horſes as are hard mouthed, and too eager, while the latter is uſed for ſuch as have a proper feeling of the bars, and eſpecially for breaking in young colts.

The ſurface may be varied as to roughneſs or ſmoothneſs, producing alſo different effects. To give the greateſt eaſe poſſible, a large and highly poliſhed bit is neceſſary. This is ſometimes provided with moveable rollers on the axis of the bit, which turning with every movement of the reins, diminiſh the friction of the bits, and render them leſs irritating. Theſe rollers, however, in reality can have but little effect in the ſnaffle, though of pleaſant effect in the mouth-piece of the curb; for this reaſon, that the ſnaffle being jointed in the middle, is drawn by the reins to a ſharp angle in the mouth, ſo that theſe rollers are preſented to the bars in an oblique direction, under which poſition it will be obvious they can have very little or no motion, but, on the contrary, they will tend to render the bits more ſevere by their irregularity; ſo that a well poliſhed ſnaffle is in fact preferable to one of theſe with rollers of the ordinary conſtruction.

On the other hand, to give the greateſt degree of ſeverity to the mouth-piece of the ſnaffle, it is twiſted while hot into a ſpiral form, and is made to preſent by this means a ſharp, rough, and unequal ſurface to the jaw, being capable, according to the degree of ſharpneſs to which the edges are wrought, of puniſhing the bars and lips with greater or leſs ſeverity. The different degrees of puniſhment which this kind of bit is capable of inflicting, will perhaps be found ſufficient for all the purpoſes of correction, where recourſe may properly be had to actual force and puniſhment. For it ſhould be always kept in view, that gentle means will produce a good mouth; while harſhneſs and too great ſeverity will tend to deſtroy it altogether.

Thus far the ancients of the moſt remote ages of the world, almoſt as far back as any hiſtory extends, were well acquainted with the uſe of bits. Xenophon, more than 400 years before Chriſt, had deſcribed ſimilar bits as being in common uſe in his time among the Grecian ſtates. He ſpeaks of a ſmooth and a ſharp kind of bit, the latter, if more ſeverity was requiſite, to be armed with points or teeth. In its uſe, however, he enjoins the greateſt tenderneſs, and obſerves "that when you would wiſh to ſlacken the pace of an eager horſe, which hurries on too faſt, and to pacify his fury, ſo as to make him go more temperately, or even oblige him to ſtop, you ſhould not attempt to do it at once, and with violence, but artfully, and by degrees, gently pulling him in, then yielding the bridle, and playing with his mouth, in ſuch a manner as if you intended rather to win his conſent than force his obedience." Chap. 9, 10.

Beyond the changes above deſcribed, the ſnaffle itſelf does not appear to admit of any alterations worthy of notice. It may, however, be juſt obſerved, that ſome horſe-men add a chain to it, extending from cheek to cheek, which reſting looſely on the tongue produces irritation and ſlavering, and, as they imagine, freſhens the mouth. Such a bit is known by the name of the *Rockingham ſnaffle*.

The reins, however, it muſt be remarked, admit of ſome alterations in their diſpoſition, which will influence the effects of the bit on the mouth; as whether they are carried higher or lower. At this preſent time there is a practice more eſpecially in horſes of light draft, as in thoſe for carriages, curricles, and chairs, &c. to diſtort and alter the bearing reins from their natural direction, and to diſpoſe them more perpendicularly and in a line with the head; ſo that inſtead of [illegible] to the back, they [illegible] parotid gland, or [illegible], where [illegible] though a ring hanging from the head [illegible] to the hook of the [illegible]. The appearance is ornamental and elegant, and the reins ſo diſpoſed are conſidered as more forcibly elevating the head than if they proceeded to the back in the uſual direction.

As the diſpoſition of the reins, ſo the figure of the bits themſelves, and the ornamental appendages attached to them, admit of almoſt endleſs variety. The manufacturers of theſe articles, availing themſelves of this licence, render their buſineſs more lucrative by as frequent changes as poſſible. Theſe are ſucceſſively introduced as faſhionable novelties, till again for novelty they return to the ſimpleſt practice; and this takes place without any alteration in the principal circumſtances of their conſtruction, properties, or uſe.

The next kind of bits in uſe for horſes is the curbed bit; which, as it is an inſtrument of much greater complication of parts than the ſnaffle, ſo it appears to have been of comparatively recent date.

In ſome of the ſculptured equeſtrian figures of the ancients ſomething like the branches of the curb may be found; but in no inſtance does there appear any thing reſembling the chain, which is abſolutely neceſſary to its effect. Their writings alſo appear to be ſilent on this ſubject. It was probably the invention of Italy or France, which for ſome centuries paſt have taken the lead of the other nations of Europe in teaching the arts of the manege. It was firſt introduced into the Engliſh army by a proclamation made in the third year of king Charles I. ſince which time it has got into univerſal uſe for the army, the field, and the road, ſo that no horſeman deems himſelf perfectly equipped without it. Moſt of thoſe writers who have treated of it in the laſt, and in the century preceding that, and who wrote probably ſoon after the commencement of its uſe, have been very profuſe in their various propoſals for the ſtructure of it, eſpecially in rendering it more complicated, ſevere, and cruel; though it is probable their clumſy figures and repreſentations were never imitated in actual practice. They appear to have been much ſatisfied with their new invention, imagining it a ſure means of reducing horſes to immediate obedience, in ſpite of every obſtacle; and true it is, it can puniſh with extreme ſeverity: but is ſuch a meaſure moſt likely to create vice, or to overcome it? Indeed, according to the opinion of one of the ableſt writers that has ever conſidered this ſubject, and whoſe opinion we ſhall take an opportunity of quoting more fully hereafter, little or nothing has been really gained by its adoption; on the contrary, the ſnaffle poſſeſſes more ſimplicity, power, and perfection.

Stripped of all unneceſſary trappings, this inſtrument conſiſts of the following eſſential parts: a mouth-piece with two ſide branches, or inflexible rods of iron, firmly fixed to the former, and a chain paſſing from ſide to ſide, behind the chin, including the jaw; two eyes or rings at the upper extremity of theſe branches, ſerve to faſten it to the head ſtall, and to ſtay it in the mouth; two other rings at the lower extremity of the above branches receive the reins, paſſing to the hand, or ſometimes in draft horſes to the hook of the ſaddle, as a bearing rein. Theſe are all the parts really neceſſary to conſtitute the curb.

The bits thus formed being placed in the mouth, and the chain paſſed round the lower jaw, the branches, it will be

readily ſeen, become powerful levers when drawn backwards, acting upon the mouth-piece as a centre, and ſqueezing, by means of the chain, whatever interpoſes between it and the mouth-piece, with a force equal to the length of lever afforded by the lower branch.

This force, it will be perceived, is influenced and regulated not only by the length of the lever below the mouth-piece, but alſo by the greater or leſſer diſtance at which the chain is placed from it. The chain is uſually fixed to the eye of the cheek-piece, where the head-ſtall is faſtened; if, therefore, this part is very long, it is evident it muſt moderate or counteract the power and effect of the lower end of the branch, and render it leſs ſevere by bringing the centre of motion nearer to the middle of the lever.

It appears manifeſt, from the conſtruction of this inſtrument, that its whole force is exerted upon the jaw itſelf, and that it has power to pinch the bars with cruel violence, even to the fracture of the bone, and this with very powerful branches has ſometimes happened. It can alſo cruſh and bruiſe, and totally deſtroy the tender covering of the inſide of the mouth, and the ſkin beneath the jaw.

From conſidering its mode of operating, it might reaſonably be doubted whether it does in reality ſtop the horſe by its power and oppoſed force, as is generally conceived at preſent, or rather by the ſeverity of the pain it inflicts; as ſhould the horſe arm himſelf againſt this, it is totally inſufficient to arreſt his courſe; of which inſtances occur in runaway horſes every day. And we ſhall venture to ſuggeſt, though contrary to the general opinion, that the ſnaffle, even in this reſpect, if the mouth has not been previouſly hardened aud ſpoiled by the uſe of the curb, is the moſt powerful inſtrument of the two.

The *mouth-piece* of the curb is uſually provided with an upſet or arch in the middle of it, as it would, if perfectly ſtraight, reſt on the tongue, and occaſion an unpleaſant reſtraint. This paſſage for the tongue is often made ſo narrow and ſmall by the bit makers, that one ſhould apprehend they ſcarcely had a right idea of its uſe. From the circumſtance of its allowing a paſſage for the tongue, it has been called by ſome, the *liberty;* and, for the ſame reaſon, by others, the *porte:* hence we have the porte-mouth bit, vulgarly called among the bit makers and grooms the *Portſmouth* bit; and by a ſuppoſed counter expreſſion to this term, we probably get the *Weymouth*-bit.

In draft horſes, eſpecially for the coach, it is a frequent cuſtom to have affixed to the upper part of the upſet ſmall chains or poliſhed drops of iron, which hanging looſe in the mouth, and falling on the tongue, occaſion the horſe to champ the bits, and create a copious flow of ſaliva, ſo as to ſlaver the lips with its white froth; and when this happens, it is conſidered by ſome a good ſign of health and gaiety, and that the horſe is well bitted; for, if the bits are diſagreeable to him, he never plays with them, or exhibits any froth, ſay they. Theſe ſmall appendages are termed by the French *les chainettes*, and by the Engliſh *players*.

It is farther to be obſerved, reſpecting the mouth-piece of the curb, that the ſtraight part which reſts upon the bars of the jaw, is termed by the French *le canon*, and by the old Engliſh writers the *jeive;* and though a highly convenient and uſeful word, it is to be regretted it is at preſent out of uſe; the French term, which is not ſo expreſſive, having ſuperſeded it. This part ſhould be well poliſhed, and may be made of any proper figure, as that of a cylinder, cone, oval, globular, pear-ſhaped, &c.

It is obvious that the effect of the curb, as far as it reſpects the bars, will be correſpondent to the thickneſs or thinneſs, ſmoothneſs or roughneſs, of this part; the larger and broader it is, the more ſurface it covers; and thus the preſſure, by being diſtributed over more points, becomes leſs felt. This enlargement, however, of the canon or jeive ſhould not be carried to an exceſs, by making it too heavy, or filling the horſe's mouth with more iron than it can conveniently receive, and thus create pain, inſtead of greater eaſe.

To render theſe irons leſs irritating to the mouth, and to avoid their friction upon the bars, the jeives are provided with looſe, moveable rollers of well poliſhed iron, which readily turning on the axis of the bits, very conſiderably diminiſh their ſeverity. Theſe moveable pieces are alſo particularly uſeful in preventing the horſe from catching and holding the bit in his teeth; as the curb, under theſe circumſtances, can ſtill move and act with the ſame freedom as before.

The jeives are ſometimes compoſed of three or four flattiſh knobs, united by a joint to each other, and with a joint to the upſet, which is intended to render it very ſevere; it is obvious, however, that ſuch an alteration muſt bring it nearer to the condition of the ſnaffle; the knobs, however, if they can be drawn tranſverſely acroſs the bars, might produce conſiderable irritation, but not ſo much as they would do if not jointed. This bit is not unfrequently uſed, and is called with us the *Heſſian*-bit.

To the curb is often fixed a ring oppoſite the mouth-piece, which, as it is directly in a line with the axis of the bit, has no other effect when the reins are affixed to it, than a ſnaffle would have provided with a ſimilar mouth-piece. This is termed putting "the reins to the cheek," and for horſes of light draft, whoſe mouths are not ruined, it is by much the beſt, as the mouth is leſs annoyed, and the horſe obeys with more alacrity the guidance of the hand from this point, than from the extremity of the branches, which are particularly ill calculated for this purpoſe: this kind of conſtruction is generally diſtinguiſhed by the name of the *Pelham* bit.

In the older Engliſh writers, as well as thoſe on the continent, on the ſubject of bits, we find an appendage deſcribed, which is not at all, at preſent, in uſe; and as it enters the mouth with the mouth-piece, it may, with propriety, be deſcribed along with it. It conſiſted of a chain extending from branch to branch of the banquet, or cheek piece, being placed rather above the mouth-piece, and parallel to it, and was ſtretched acroſs perfectly ſtraight and tight. This part was called the *water-chain*, and by the French *Trenche-file:* its uſe is not very evident. Mr. Berenger takes notice of it, and obſerves "that it might be uſeful to horſes that are apt to drink or ſwallow the bits, as the expreſſion is, or bury it ſo deep in their mouths, as to hinder it from having a due and juſt effect;" from its being laid aſide ſo generally, we preſume it has at leaſt been thought uſeleſs.

It is a common belief with the grooms, that a great power reſides in the upſet of the mouth-piece, and that the bits are more powerful as this is longer or ſhorter; nothing, however, can be more fallacious than this reaſoning. In the works of Laurence Reeſe, alſo a French writer, we find, in conſonance with this idea, a curb, with an upſet of unuſual length, being deſtined to correct the vices "d'un Rouſſin qui à la bouche d'une diable;" it will be obvious, however, on a moment's reflection, that this part, from being made very lofty, and coming forcibly againſt the palate, would compel the horſe to open his mouth, when it would ceaſe farther to act in any way; with more reaſon, the ſame writer propoſes, on the other hand, "pour donner

"grand plaisir," to have a bit constructed with a low upset, and sufficiently wide, with large, conical, smooth jeives for the bars.

Of the chain. The chain is the part most essentially necessary to give effect to all the other parts of the curb, and may be placed, as we have already noticed, at any given distance above the mouth-piece; its operation being more powerful, as this distance is exceeded by the length of the branches. This position, though true as a general principle of reasoning, appears to be subject to the operation of other causes in actual practice, which it will be necessary to consider; for, in direct contradiction to this is the assertion of Mr. Berenger, who appears to be almost the only writer who has truly investigated the merits of this particular object. He observes, in regard to this, that the nearer the chain, and the longer the branches, the softer and more indulgent its operation. This, on a first view, would appear to be in direct variance with the rules above laid down, and irreconcileable to the well known laws of the operation of the lever, and even at variance with his own preceding assertions; when, however, we remember the experience and practical knowledge of him who asserts it, it deserves a more particular consideration; let us first admit the truth of the position, as it seems founded on the sure test of actual experience, and then we should venture the following as the most natural explanation of it.

In proportion as the branches are longer, the more extensive is the circuit their extremities perform in their operation; and therefore, the hand that guides them must pass through a greater space to produce the same effect: and now if the chain be placed very near to, or upon the out-side of the mouth-piece, and be applied not very tight about the chin, yet, in reality, though there would be an apparent increase of power by the length of the branches, they would have little or no effect, as they would arrive at the utmost extent to which they can be drawn, before the chain would begin to pinch. On this account, the most lively effects would be produced by the chain having more sweep and extent of action, and by the branches being not quite so long, as great length also adds something to their flexibility, though not to a degree to be worth taking into the account. Still, however, the branches must ever obey the common laws of the lever, acting with force proportioned to their length; while shorter branches act with greater quickness, and are more lively in their impression.

The chain is fastened on one side to the eye of the banquet, where the head-stall is fastened; on the other, to a hook hanging from the same part. This chain, as it is at present used, is composed of iron links or rings, so bent or indented, as to form, when put together, one uniform nearly flat surface; and these links, by twisting or untwisting, may be made to present a surface with any degree of roughness to the chin.

When great tenderness is required, this chain may be covered with leather or cloth; or where a still greater delicacy is desirable, the curb may be made wholly of leather, without any chain.

The larger and thicker the rings are, provided they are smooth and well polished, the easier the effect of the chain. In old English, this chain was called the *kirble*; and hence, by contraction, *kirb*; and finally, by an easy transition of the *ki* into *cu*, we apprehend that the modern appellation of this instrument is obtained.

Of the branches. The proportion which the cheek part bears to the lower extremity of the branches, or rather the position of the eye, to which the chain is fixed, determines the degree of power of the bit upon the principle before advanced, that is, if the chain is fixed to the upper extremity of it as it usually is to the transverse opening or eye of the head-stall.

For the elementary view we are taking of the construction of the bits, it has been only considered as a straight, plain lever of indeterminate length; it is, however, in practice, often varied, as in the army, it is used of enormous length, and frequently curved like the letter S, by which it is conceived to be rendered more powerful, as well as ornamental; at other times the branch of the bit, with a view of increasing its force, is carried forward with a sharp elbow, giving nearly the figure of the letter Z; while by others, with more reason, to prevent the horse from catching the bit in his mouth, it is made with an arch, or semicircle, in the middle of the branch, like the letter C, turned backwards for the same purpose; still, however, in fact, whether bent into that or any other shape, it is the length of the lever, and its strength, which alone give the power; it is true, however, that a long curved branch, though more powerful, will render the effect somewhat softer, as coming from a greater distance, especially if the branch is at all flexible and yielding, than it would by the quick and rigid effect of a shorter lever, made perfectly straight and inflexible: these branches may also be turned or bent, not only backward or forward, but also outwards and inwards. At their extremities, those turned outwards, are said to be strongest of any in their operation.

As to the cheek-piece, or banquet, as it is called by the French, for an appropriate name is wanting to this part in the English language; the eye of the banquet, say the horsemen, commands and gives efficiency to the rest of the bit; or, in other words, decides the distance of the chain from the mouth-piece, or centre of motion; as however, in speaking of the other parts, we have had occasion to introduce a sufficient account of this, it will not be necessary farther to give it a separate consideration; nor will it be useful to describe the numerous mongrel herd of bits engendered of the snaffle and curb, which are reducible to the properties of one or the other, or partaking of both.

The most useful bit of the curbed kind, appears to be the *Weymouth*-bit, which is at present in common use for draft horses of light work, as for carriages, coaches, &c. It consists of a strong, plain mouth-piece, of uniform thickness throughout, without any upset or jeives, but is simply curved forwards, to give liberty to the tongue: this kind of construction is the simplest perhaps that the curb admits of.

In concluding, it remains for us to notice the proper application and adjustment of these bits to the horse's mouth, and to treat of their real effects.

By the management of the head-stall, the snaffle bits should be so adjusted as to fall in the middle space between the tushes and grinders, resting upon the bars: the mouth-piece of the curb should also occupy the same situation when, however, it is used along with the snaffle, the bits of the snaffle should be placed highest in the mouth.

If the bits are placed too high in the mouth, the horse carries his head aloft; if too low, he stoops the head, and tries to catch them in his teeth.

The thicker and more fleshy, and the wider or broader the bars of the horse, the rougher may be the mouth-piece for the leaner and more delicate; consequently, the bits should be less severe. Care should also be taken that the mouth-piece be well suited to the size and width of the mouth, and be not too narrow, as this would give pain by squeezing the bars together: if, on the contrary, it is very wide, it rests with more force on the bars, without the interposition

of

of the lips, as is most usually the case. Where the tongue is large and prominent, the upset should also be in proportion, otherwise the bits could not rest upon the bars, but would press upon the tongue.

In regard to bitting the horse, and the consideration of its effects, we cannot desire to see any thing more consonant to truth and reason, than what has been given us by Mr. Berenger, and with some useful extracts from his valuable performance, we shall conclude this article.

Of bitting horses with the curb. "In the beginning of an undertaking, whose aim is to subdue and reclaim nature, and that at a time when she is wild, ignorant, and even astonished at the attempts which are made upon her, it is evident that she must not be treated but with lenity, instructed with patience, and by small degees, and that nothing should be offered that may hurt, surprize, or occasion any disgust.

The horseman, therefore, should not act the part of a tyrant, but of a lover; not endeavour to force her to submission, but strive to gain her consent and good will by assiduity, perseverance, and the gentlest attentions; for what prospect of success would rougher manners afford? To what purpose would it be to compel a colt to go forward, or turn from fear of the whip or spur, and to trot and gallop so freely as to supple his limbs, and form his paces; if the novelty of the bit, and the unaccustomed restraint to which it subjects him, should vex and confound him, so as to make him not know what to do, or how to behave in these extremes? It cannot be expected, that he will be guided, and go with ease to himself, or pleasure to the rider, if the instrument, by which he is to be conducted, offends or gives him pain: all habits and acquirements should be attained gradually, and almost imperceptibly: rigour and precipitation would ruin all; and, instead of forming the horse to the execution of what is required, may plunge him into vice and rebellion, so as to occasion much trouble and loss of time before he can be reduced.

He should not therefore, at first, be considered as if he was designed to be formed to all the delicacy and exactness of the bit; and the horseman should be content, if he will endure it in his mouth, so as to grow, by little and little, accustomed to it, till the restraint becomes by habit so familiar and easy, that he not only is not offended, but begins even to delight in it; for this purpose, great care should be taken that the bit be easy and gentle in all its parts; that the mouth-piece be larger than it need be for an horse already bitted; that it in no wise incommodes the bars, squeezes the lips, or galls the tongue.

The mouth-piece, called a cannon, with a joint in the middle, will be the most suitable; the ends of it should be as large and full as the size of the mouth will permit, for the thicker and more blunted they are, the easier they will be for the horse, and the *appui* less strict and severe.

The links of the curb should be big, smooth, and well polished; the curb somewhat long. The branches should be exactly even with a line of the banquet, to make the appui moderate and equal; they should likewise be long; nor does it signify of what shape they are, for with most horses they ought to be so weak, as scarcely to have any effect: so requisite it is to guard against every thing that may annoy or disturb the horse in these first trials. In order to reconcile him to this new constraint, the reins should be held in both hands; and the horse, for some time, should only walk under the rider. Above all, upon this, and all other occasions, a firm, a light, and diligent hand, is necessary.

Such are the outlines and general principles upon which the art of bitting horses is established; which art, as far as it reaches, is sure and constant; but which, in spite of all the merits and praise of which it has so long been in possession, will, upon a serious and strict trial, never, I doubt, be found adequate to the views of a sound and intelligent horseman, nor capable of bringing a horse to that degree of suppleness and exactness of carriage, which the truth and perfection of the art require, these attainments seeming to have been reserved for a more simple but powerful machine, called the *snaffle*."

"To perform his business jullly and gracefully, the animal must first be made supple in his fore parts, and his head and neck so managed, that one may be raised, and the other arched or bent, more or less to the hand to which he is to turn. The bridle, called the bit, is so impotent in its endeavours to raise the head, that it even produces the opposite effect; nor from the confinement in which it keeps the horse, and the small compass it affords for the action of the rein, does it allow the rider sufficient room to bend him, without pulling down his head, and putting him upon his shoulders, both of which are incompatible with the true and sound principles of the art. The frequent use of cavesons and bridons, fully evinces the want of power in the bit to supple the horse, or raise the fore part.

The figures and representations of horses working upon different lessons, may be appealed to for the confirmation of this assertion: the books of past times abound with them, especially that boasted work of that king of horsemen, the duke of Newcastle, whose horses are all drawn with their heads between their knees; and yet are exhibited to the equestrian world as standards of truth, and models of perfection. The successors of this duke, and of other great masters, as imitators, are generally a blind and servile herd, ran headlong into the errors, and adopted the faults of their predecessors; and always made use of bits, without reflecting upon their effects, or perceiving that they could operate to make the horse carry low, or to put him upon his shoulders, while they thought that he was all the time upon his haunches."

"If ever there was a panacea, or universal medicine, the snaffle is one for the mouths of horses: it suits all, and accommodates itself to all; and either finds them good, or very speedily makes them so; and the mouth once made, will be always faithful to the hand, let it act with what agent it will. This bridle can at once subject the horse to great restraint, or indulge it in ease and freedom: it can place the head exactly as the horseman likes to have it, and work and bend the neck and shoulders to what degree he pleases. He can raise the head, by holding up his hand; by lowering it, it can be brought down; and if he chuses to fix and confine it to a certain degree he must use for this, as well as for the purpose of *bending*, *double reins*; that is, two on each side, the ends of which must be fastened in a staple near the pommel of the saddle, or to the girths, higher or lower, as the mouth, proportions of the horse, and his manner of going require; and if properly measured and adjusted, they will form and command the horse so effectually, as, in a great degree, to palliate many imperfections of the mouth, and many faults in the mould and figure."

"The reins thus fastened, or even one only, for the sake of working one jaw and one side, will operate more or less, as the branches of a bit: and the snaffle will almost be a bit, a bridon, a caveson, and martingal, in one. When the horseman would bend the horse, he must pull the rein on that side to which he is going, and lengthen that of the opposite, that they may not counteract each other. Nothing

thing will awaken a dull mouth, and bring it to life and feeling, so soon as this bridle. If the mouth be hard and callous, the iron should be so twisted as to have a sort of edge, which will search the lips, and when they will permit, the bars also; and if gently moved, or drawn from side to side, keep the mouth fresh and cool. If the twisted, or rough snaffle, be thought too harsh, and the hand not skilful enough to moderate its effects, a smooth snaffle may be used; or if a bit of linen be wrapt round the twisted snaffle, it will make it easy and smooth; and the mouth, once made fine and delicate, will be true to its feelings, will obey the snaffle, and follow the hand with as much exactness and precision as the bit knows to demand, but with more freedom and boldness than it ever can allow."

Such are the properties and merits of the snaffle, which long observation, and not a little experience, have taught the writer of this article to think preferable (generally speaking) to those of the bit; and which he has been therefore induced to point out and recommend with due deference to others, but with a greater deference to truth and justice.

"—Detrahere ausus,
Hærentem capiti multa cum laude coronam."

Berenger's Hist. and Art of Horsemanship, vol. ii. p. 221, &c.

Bit is also used for a little tool, fitted to a stock or handle, for the purpose of boring. In this sense, we say, the bit of a piercer, an augre, or the like; meaning that iron part of those tools wherewith the holes are bored.

The bit used by the block-makers, resembles the shank of a gimblet, from six to twelve inches long, and from half an inch to an inch in diameter, and has at its end either a screw, a sharp point, or edge, for the purpose of cutting or boring holes. The *centre-bit* is a bit, having in the middle of its end, a small steel point, with a sharp edge on one side to cut horizontally, and a sharp tooth on the opposite side to cut vertically. Holes bored with this instrument, are not liable to split. The *countersunk-bit* is a bit having two cutting edges at the end, reversed to each other, which form an angle from the point. *Gouge-bit* is a bit smaller than a centre-bit, with a hollow edge at its end, like a gouge. *Nose-bit* is a bit similar to a gouge-bit, having a cutting edge on one side of the end.

Bit *of a Key*, is that part fitted at right angles to the shank of the key, wherein the wards are made. See Lock, &c.

Bit is also used in *Commerce*, for a piece of coin current in Jamaica, and valued at 7½d.

Bits, or *Bitts*, in a ship denote a frame composed of two upright pieces of timber, called the pins, and a cross-piece fastened horizontally on the top of them; used for belaying cables and ropes to. *Bowline and brace-bitts* are situated near the masts; the *fore jeer*, and *top-sail-sheet bitts* are situated in the fore-castle, and round the fore-mast; the *main jeer*, and *top sail-sheet bitts* tenon into the fore-mast beam of the quarter-deck; the *riding bitts* are the largest bitts in the ship, and are those to which the cable is bitted, when the vessel rides at anchor. The *cable is bitted*, or confined to the bitts by one turn under the cross-piece, and another turn round the bitt-head. In this position, it may be either kept fixed, or it may be veered away.

Bit-*Stoppers*, are those stoppers that are used to check the cable. See Stopper.

BITAZA, in *Ancient Geography*, a town of Asia, in Aria, according to Ptolemy.

BITBOURG, in *Geography*, a town of the Netherlands, in the duchy of Luxemburg before the revolution, but now a principal place of the canton of the same name, in the department of Forêts, containing 1638 inhabitants; the population of the canton consisting of 7160 persons. Its territorial extent includes 225 kiliometres, and 12 communes. N. lat. 50° 0′. E long. 6°. 43′.

BITCH, in *Zoology*, is the female of the canine species, in contradistinction to dog. (See Canis.) It is sometimes used in a similar sense with respect to foxes, the female being termed a "bitch-fox;" though the more common appellation among sportsmen is a "vixen." Bitches are sometimes spayed, to prevent their farther propagation; the best time for which operation is about after the heat is gone off.

BITCHE, in *Geography*, a town of France, and principal place of a district, in the department of the Moselle, containing 2310 inhabitants; the number of those in the canton being 10,441. Its territorial extent is 312½ kiliometres, and it includes 23 communes. It is seated on a river at the foot of the Vosges mountains, on the frontiers of Deux Ponts. It was taken by Lewis XIV. and fortified by Vauban; afterwards dismantled and restored to the duchy of Loraine. In 1740, it was again fortified. Before the revolution, it was the capital of a country, including 50 villages. N. lat. 49° 5′. E. long. 7° 44′.

BITCHU, or Bitsiu, a province of Nipon, in the islands of Japan, between about 34° 30′ and 35° N. lat. and about 134° 30′ E. long.

BITCHYS, a tribe of Tartars, visited by La Perouse in 1787. and described by him. See Orotchys.

BITE is defined to be a solution of the continuity of a soft part, caused by the impression of an animal's teeth.

Bite of *Mad-dog*. See Hydrophobia.

Bite of *Serpents*. See Poison.

Bite of *Rattle-snake*. See Poison.

Bite of the *Tirantula*. See Tarantism.

Bite is also applied, in a less proper sense, to the impression of other sharp or pungent bodies. Thus a file is said to bite the metal; aqua fortis bites, or eats into copper. An anchor is also said to bite, when it holds fast in the ground

BITERLAGH, or Bitherlage, the ancient Danish military or camp law.

The word is compounded from *bithe*, *mulct*, and *lagh*, *law*; q. d. the law of *mulcts*, or *wites*.

Among the laws of the Danes, there are two peculiarly eminent; viz. the *bird straa*, or *court law*; and the *bitherlage raett*, made by Canute the Great, about the year 1035; of which an edition has been given by Resenius.

BITETO, in *Geography*. See Bidetto.

BITHABA, in *Ancient Geography*, called also *Birthama*, a town of Asia, in Assyria, according to Ptolemy.

BITHER, a city of Judæa, called by St. Jerom, Bethoron, which was the place of retreat of the impostor Barchochebas, fortified by him, and made the capital of his new kingdom. It was besieged by the Romans under Julius Severus, A. D. 134, and after an obstinate resistance, compelled to surrender. See Barchochebas, and Bethoron.

BITHEREMAN, a town of Phœnicia, according to Sozomen, situate at the extremity of the territory of Eleutheropolis.

BITHIA, a town of Asia, placed by Ptolemy in Media.

BITHIAS, a town of Asia, in Mesopotamia, according to Ptolemy.—Also, a river of Thrace, according to Appian.

BITHIGA, a town of Asia, in Mesopotamia. Ptolemy.

BITHYÆ, a people of Thrace, who, according to Steph.

Steph. Byz. derived their name from *Bithyus*, a ſon of Mars; but more probably from the river Bithys, or Bithias, mentioned by Appian, and denominated Bathynius, by Ptolemy.

BITHYLA, a town of Greece, in the interior parts of Laconia. Ptolemy.

BITHYNIA, a province of that part of Aſia, which was commonly called Aſia Minor. It was anciently known by the names of Myſia, Mygdonia, Bebrycia, and Mariandynia, as well as Bithynia; and extended from Myſia on the weſt, to Paphlagonia on the eaſt. It was bounded on the weſt by the Boſporus Thracius and part of the Propontis, on the ſouth by the river Rhyndacus and mount Olympus, on the north by the Euxine ſea, and on the eaſt by the river Parthenius. Ptolemy enlarged the extent of Bithynia, ſo as to make it comprehend ſome provinces bel nging, according to other geographers, to Galatia and Paphlagonia. The chief cities of Bithynia on the coaſt were Myrlea, Daſcylos, Cius, and Nicomedia the metropolis. On the Boſporus ſtood the famous city of Chalcedon. In the Euxine ſea were ſituated the city and ancient republic of Heraclea. The principal inland cities of Bithynia were Pruſa, Libyſſa, and Nicæa or Nice. Its chief rivers were the Pſillis, Calpas, Sangarius or Sagaris, Hipias, Rhebas, and Lycus; all diſcharging themſelves into the Euxine ſea between Chalcedon and Heraclea. As Bithynia lies between 41° and 43° of north latitude, and is watered by many rivers, it once abounded with all the neceſſaries of life. The ancients compare ſome of the inland provinces to the fruitful and delicious vales of Tempe; but at preſent it lies in a great degree neglected and unmanured. Bithynia was anciently inhabited by various nations, differing in their manners, cuſtoms, and language; namely, the Bebryces, the Mariandyni, the Caucones, the Dolliones, and the Cimerii. Theſe different nations were anciently governed by their own kings; Bithynia being, in the earlieſt times, divided into as many kingdoms as nations or tribes. However, in proceſs of time, theſe petty princes were reduced by the more powerful kings of Bithynia. According to Diodorus Siculus, the Bithynians had kings from the time of Ninus; and, according to Appian, they had 49 ſovereigns before the Romans obtained poſſeſſions in Aſia. But this high antiquity is rendered doubtful by the ſilence of Homer reſpecting the Bithynians. Strabo (l. xii.) ſpeaks of one Pruſias, who reigned in Bithynia in the time of Cræſus, the laſt king of Lydia, by whom he was conquered. From this period, the Bithynians continued ſubject firſt to the Lydians, and afterwards to the Perſians, till the reign of Alexander the Great; for we find them mentioned by Herodotus among the many nations that attended Xerxes in his expedition into Greece. While they were ſubject to the Perſians, they ſeemed to have been ſtill governed by their own princes. Under Nicomedes I. the Gauls, whom he called to his aſſiſtance, firſt paſſed into Aſia, and obtained a ſettlement in that part of Aſia Minor, which was called from them Gallo-Græcia and Galatia. The laſt king of Bithynia was Nicomedes IV., who, at his death, in the year before Chriſt 75, bequeathed his kingdom to the Romans, by whom it was reduced to the form of a province.

Bithynia, in *Modern Geography*, forms one of the diſtricts of Anatolia, and is the neareſt province to Turkey in Europe, being parted from it only by the ſmall ſtrait called the Thracian Boſphorus. Its principal cities are Pruſa, Nice, and Nicomedia.

BYTHINIARCHIA, a ſort of ſuperior prieſthood in the province of Bithynia, to which belonged the ſuperintendency of the ſacred games, and which gave an exemption to him poſſeſſed of it, called bithyniarcha, from the care of tutorage.

BITHYNIUM, in *Ancient Geography*, the ancient name of a city of Bithynia, afterwards called Claudiopolis.

BITIS, in *Zoology*, a ſpecies of Coluber that inhabits Braſil. Above, this creature is cinereous, yellow, varied with white and red, and tranverſe brown bands; beneath, yellowiſh, with a middle row of very minute ſcales. *Gmel.* &c. *Vipera bitis* of Laurent. Amph.

BITON, in *Conchology*, the name of the Linnæan *cypræa pediculus* in Adanſon's Senegal, &c.

Biton, in *Entomology*, a ſpecies of Papilio, ſo named by Eſper. It is *papilio damon* of Gmelin.

BITONTO, in *Geography*, a town of Naples, in the country of Bari, about 8 miles from the Adriatic, the ſee of a biſhop, ſuffragan of Bari. This is a fine town, containing 16,0 0 inhabitants, of more eaſy fortunes, and more poliſhed manners, than thoſe who dwell in the cities along the coaſt; its markets are well ſupplied, and it has an air of affluence. The country between it and Bari, at the diſtance of 9 miles, is very much incloſed; and though ſtony, fertile in corn, almonds, olives, wine, and fruit of all kinds. Near this city an obeliſk was erected by the king of Spain, with ſome fulſome inſcriptions in praiſe of himſelf, his father Philip, his ſoldiers, and the count of Mortemar, who was honoured with the title of duke of Bitonto, for having defeated the Auſtrians on this ſpot in 1734. The monument, however, which records a trivial victory, is crumbling to ruin.

BITTACLE, or Binacle, a ſquare box, or frame of timber, placed in the ſteerage of a ſhip, wherein the compaſs is placed. The word is formed, by contraction, from the French *habitacle, a ſmall habitation*, which ſignifies the ſame.

Large veſſels have two bittacles, a leſſer placed before the pilot, and a greater before the ſteerſman.

In the ſmaller veſſels, the bittacle is divided into three ſpaces or apartments; in large veſſels into five. One for the hour-glaſs; another for the lamp or light; another for the compaſs, &c.

Great care is to be taken in the diſpoſition, framing, &c. of the bittacle, that it ſtand true, and that it be not faſtened together with iron nails, but with wooden pins, becauſe the former would affect the compaſs. See Compass.

BITTENDORF, in *Geography*, a town of Sileſia, in the principality of Neyſze, 2 miles N. of Otmuchan.

BITTER, in *Sea Language*, denotes the turn of the cable round the bitts.

Bitter *almonds*. See Almond.

Bitter *apple*. See Colocynthis.

Bitter *end* of a cable, that end which remains on board round the bitts, when the ſhip is at anchor; the other part of the cable being veered.

Bitter *gourd*. See Colocynthis.

Bitter *place*, *locus amarus*, a poor barren ſoil, by Pliny called *terra amara*, *ſive macra*.

Bitter *purging ſalt*, *ſal catharticum amarum*. See Epsom *Salt*.

Bitter *ſweet*, in *Botany*. See Solanum.

Bitter *vetch*. See Orobus.

Bitter *waters*. See Water.

Bitter *wine*. See Wine.

Bitter *wood* and *aſh*. See Quassia.

Bitter *wort*. See Gentiana.

BITTERFELD, in *Geography*, a town of Germany, in the circle of Upper Saxony, and electorate of Saxony, ſeated

ſeated on the Moldau, 16 miles S. of Deſſau, and 18 S.S.W. of Wittenberg.

BITTERN, Bittour, in *Ornithology*, the Linnæan *ardea ſtellaris*; which ſee.

Bittern, is alſo a name given to the brine ſwimming upon the firſt concreted ſalt in the ſalt-works; this liquor is laded off, that the ſalt may be taken out of the veſſel, and is afterwards put in again, and affords more ſalt, which is to be ſeparated like the reſt, by lading off the liquor a ſecond time, and ſo on. The bittern, according to Mr. Boyle, is a very ſaline, bitter, ſharp, pungent liquor, which drains off in the making of ſalt from ſea-water; or which remains in the pans, after the coagulation and granulation of the purer and more ſaline part by boiling. A bittern alſo runs, or oozes, from the heaps of foſſile ſalt at Lymington, and Portſea in Hampſhire. Phil. Tranſ. N° 377. p. 348.

Bittern makes the baſis of *ſal catharticum amarum*, or Epsom-salt.

Bittern is the mother-water which remains after the cryſtallization of common or marine ſalt in ſea-water, or the water of ſalt ſprings. It abounds with Epſom ſalt, or the combination of vitriolic acid with magneſia, to which its bitterneſs is owing. It is employed in this country for making a purging bitter ſalt, which proves ſimilar in quality to the ſalt obtained from the Epſom waters, and is commonly ſold under its name. The ley is boiled down to a certain pitch, then filtered and inſpiſſated; the dry matter is calcined, re-diſſolved, and cryſtallized. If the mother-ley be inſpiſſated and diſtilled with vitriolic additions, a ſpirit of ſalt is obtained. Neumann, p. 212.

BITTERS, in the *Materia Medica*. The quality of bitterneſs (a ſimple perception familiar to every one, and which cannot be defined) is much more frequently met with in vegetable matter, than in any other order of natural ſubſtances; and in this, it moſtly reſides in a certain ſoluble matter, with tolerably uniform chemical properties, which has by ſome been denominated *bitter extract*. This diſtinction, though not perfectly accurate, is of conſiderable uſe in pharmacy; for whenever a bitter taſte is perceived in any part of a vegetable, we may conclude, with much probability, that it reſides in this ſpecific part of the vegetable, and eſpecially that it gives certain medicinal properties, which experience has ſhewn to be in the higheſt degree important.

The bitter principle is found in combination with a variety of other active ſubſtances, which modify, alter, correct, or impair its medicinal powers.

A pure, ſimple bitter vegetable (of which gentian, or quaſſia are good examples), is entirely void of ſmell, has neither acerbneſs nor aſtringency to the taſte, nor does it excite nauſea, unleſs in exceſſive quantity. The bitterneſs is readily extracted by almoſt every menſtruum, aqueous, as well as ſpirituous; and in the ſimple bitters, little, if any difference, is perceived in the ſenſible properties of what is extracted, whatever be the medium. The bitter extract is not volatile by heat: hence, in the diſtillation of bitter plants that yield an eſſential oil (worm-wood, for example), the diſtilled oil has none of this taſte, the whole remaining in the reſidue. A watery, or ſpirituous infuſion of a bitter plant, inſpiſſated nearly to dryneſs, becomes intenſely bitter, often with an empyreumatic, or a ſomewhat altered taſte. This, when further dried, becomes ſolid and pulverulent. The extract is a convenient form for theſe ſubſtances, but the flavour is not ſo acceptable to the palate as the ſimple infuſions.

The bitter extract is conſiderably antiſeptic. Experiments have proved that the putridity of animal matters is much retarded by immerſion in bitter infuſions, even the watery; and ſubſtances already putrid, in ſome degree, loſe their fœtor by this addition. The watery infuſions of bitter vegetables mould by long keeping, and become ſour. This change takes place in ſummer, in five or ſix days, when the infuſion is not very ſtrong. The newly acquired acid taſte in ſome degree maſks the bitterneſs; but this latter quality remains extremely long, and is hardly ever loſt by ſpontaneous decompoſition.

The effect of the ſimple bitter on the human body, is generally conſidered as purely Tonic. It does not raiſe the pulſe; nor does it directly, or conſtantly produce any change in the ſecretions or excretions of the body. Its chief and moſt obvious operation is to increaſe the appetite, and promote the digeſtive powers; and hence it is with reaſon ſuppoſed, that its virtues depend on ſtimulating the fibres of the ſtomach. From this ſingle effect may be derived the well known uſe of bitters, in giving general tone and vigour to the ſyſtem, in a vaſt variety of caſes of debility, unconnected with organic diſeaſe, in checking aceſcency of the ſtomach, heartburn, flatulence, and other ſymptoms indicating a deficiency of the digeſtive powers, and in extending its ſalutary operation through the whole of the alimentary canal, reſtoring the regular and natural action of the bowels impaired by the original defect of the digeſtive organ.

Bitters have been ſuppoſed by ſome to increaſe the intoxicating powers of ſpirituous liquors. This however, appears to apply only to the *narcotic* bitters, and to be attributable to the narcotic, and not the bitter principle. On the contrary, the ſalutary action of bitters on the digeſtive powers, is well calculated to correct the extreme and peculiar debility of the ſtomach, induced by habitual drinking.

An anthelmintic virtue (or power of expelling worms from the human body) has been attributed very generally to all bitters indiſcriminately. There does not, however, appear to be much foundation for this opinion, unleſs the bitterneſs be combined with a purgative property, as in aloes, or poſſibly a narcotic. The contents of the inteſtines being always intenſely bitter by the natural admixture of bile, it does not appear probable that animals, which live and grow in ſuch a medium, can be much moleſted by a ſmall addition of this principle, though from a vegetable matter.

An exceſſive habit of taking bitters, may finally prove detrimental to the ſtomach, by over-excitement, or by inducing a kind of artificial demand for food in greater quantity than is ſalutary to the general health. A remarkable example of the danger of theſe medicines, long perſiſted in by perſons of gouty habits, is afforded by the operation of the *Portland powder* in this diſeaſe.

The chief combinations of the bitter principle uſed in medicine are *Narcotic bitters*, ſuch as opium, faba Sancti Ignatii, bitter almonds, and the kernels of many fruits: *Aromatic bitters*, as orange-peel, caſcarilla, and wormwood: *Aſtringent bitters*, a very large claſs, and generally combined both with tannin and the gallic acid, of which cinchona, and many other barks are ſtriking examples: *Acid and purgative bitters*; the ſquill, colocynth, aloe, and ſome other combinations of leſs frequency.

For medicinal uſe, the aromatic is always an uſeful addition to the bitter, and is generally employed.

The moſt important of the animal bitters is the bile, the properties of which have been mentioned under that article. In tonic power, it cloſely reſembles the vegetable bitters. Late experiments make it probable, that the *Pruſſic acid*, a very peculiar animal bitter, poſſeſſes properties ſimilar to the vegetable narcotic bitters.

A few of the mineral, or common ſaline combinations, are diſtinguiſhed by bitterneſs of taſte; but it is doubtful how far

far this principle modifies their medicinal powers. The nitrated silver is of this kind, a salt esteemed to be a very powerful tonic, taken internally in small doses. Some of the saline combinations of magnesia have the same taste, and it is possibly on this account, that the sulphat of magnesia will often be retained by very irritable stomachs, when other saline medicines are rejected. For the pharmaceutical preparations of the several bitters, see the respective articles; as *Gentian*, *Quassia*, *Columbo*, *&c.* and that of *Bitter Extract*.

BITTOUR, in *Ornithology*. See BITTERN.

BITUBERCULATA, in *Entomology*, a species of CASSIDA, of a brown colour, with a white margin; wing-cases spotted with black, and a single tubercle at the base of each. A native of Cayenne. Fabricius.

BITUBERCULATUS, a species of CURCULIO, that inhabits New Zealand. This is of a ferruginous colour; thorax length of the wing cases, and dotted, with two tubercles on the back. Fabricius.

BITUBERCULATUS, a species of CRYPTOCEPHALUS (*Crioceris*), that inhabits Africa. It is fulvous; wing-cases pale, entirely bordered with fulvous. Fabricius.

BITUMEN, *Bitumé*, Fr. The bitumens, properly so called, form a species of compound mineral inflammables, of which the following are the characters. 1. By exposure to the air, and the application of heat, they burn with a flame more or less vivid, and leave scarcely any residue. 2. By destructive distillation, they yield a liquid acid, but no ammonia, a variable but small proportion of charcoal being left behind in the retort. 3. They are either liquid, or capable of being rendered so by a moderate degree of heat.

Bitumens may be divided into two families, the non-elastic and elastic. To the former belong naphtha, petroleum, mineral tar, mineral pitch, and asphaltum; to the latter belong mineral caoutchou, and suberiform mineral caoutchou.

§ 1. *Non-Elastic Bitumens.*

NAPHTHA, *Bergnaphtha*, *Napthe*, *Bitume liquide blanchâtre*, is a substance of a light brown, or wine yellow colour, perfectly fluid and transparent. It is the lightest of all liquids, its specific gravity being $=0.708$ to 0.732: it has a strong penetrating bituminous smell; it takes fire with great readiness, and burns with a bluish yellow flame and copious black smoke, leaving no residue. It may be rectified by distillation with water, in the same manner as the essential oils, and then becomes colourless, and weaker in its odour. It does not combine in any considerable degree with either water or alcohol, but unites easily with ether, with turpentine, with caoutchou, and the essential oils. When rubbed with the caustic fixed alkalies, it form a kind of Starkey's soap. The concentrated sulphuric and nitric acids are decomposed with vehemence upon it, converting it into a solid resinous substance soluble in alcohol. Even the purest naphtha, when exposed to the air, becomes first of a yellow, and then of a brownish colour, acquires a somewhat viscid consistence, and thus passes into petroleum. Naphtha is procured for the most part from very copious springs of this substance at Baku on the shore of the Caspian sea, where it is burnt in lamps instead of oil, and is used medicinally both externally and internally in rheumatic and other complaints. It is also met with in Calabria and some parts of Italy.

PETROLEUM, or *Rock-oil*. *Erdohl*, *Stein-ohl*. *Petrole*. The colour of petroleum is a blackish or reddish brown; it is fluid, though somewhat viscid; it is almost opaque, is unctuous to the touch, and exhales a strong bituminous odour; its taste is pungent and acid. Sp. gr. 0.747, 0.854. Petroleum may be rectified by distillation with water, in which process, the carbon, which thickens and colours it, is left behind in the retort, and a colourless fluid comes over, possessed of all the properties of naphtha. When petroleum is distilled *per se*, there first arises some naphtha, then a watery empyreumatic acid, and lastly a thick dark-coloured oil, a spungy coal remaining in the retort. In its combinations with, and chemical actions on other substances, it perfectly resembles the preceding species. It is found wherever naphtha is, and in many other places among stratified mountains, in the vicinity of coal. In England, Coalbrook dale, and Pitchford in Shropshire, are the principal places where petroleum is found; at the latter place extensive strata of sandstone are saturated with petroleum, and the naphtha, procured by distillation of the stone, is sold under the name of Betton's British oil, and is esteemed an active remedy in strains and rheumatism.

MINERAL TAR, BARBADOES TAR, *Bergthier*, *Goudron mineral*. This substance differs from the preceding only in degree; it is more viscid, more opaque, of a darker colour, and, when distilled, leaves a larger carbonaceous residue. It is found native together with petroleum, and may also be procured by the distillation of coal.

MINERAL PITCH, *Maltha*. The external characters of maltha are extremely similar to those of common pitch; when heated, it emits a strong unpleasant odour. In cold weather it may be broken, and exhibits a vitreous lustre; but when warm it is soft and tenacious.

ASPHALTUM, *Schlachiges Erdpech*, *Asphalte*. The colour of this substance is black or brownish black; it is light and brittle; when broken, it displays a conchoidal fracture and vitreous lustre; it has little or no odour, unless it is rubbed or heated. It is considerably inflammable, melts easily, and burns away without leaving any residue. It is principally found on the shores of the Dead Sea, in Syria, and in the isle of Trinidad in the West Indies.

The principal use of asphaltum is an ingredient in certain varnishes, especially that used by the copper-plate engravers.

§ 2. *Elastic Bitumens.*

MINERAL CAOUTCHOU, *Elastiches Erdpech*, *Poix minerale elastique*. The colour of this substance varies from yellowish brown to olive brown and blackish or reddish brown. The light coloured is often in a semifluid state, and adheres to the fingers; the olive brown is solid and elastic; the blackish and reddish brown are hard and little elastic. It occurs stalactitical, or investing, or in masses. Its sp. grav. in the soft varieties is about $=0.9$, and in the hardest and least elastic is $=1.2$. It passes into asphaltum.

It is partly soluble in sulphuric ether; but the residue of the solution, after evaporation of the ether, is not elastic; thus forming an essential difference between the vegetable and mineral caoutchou.

This singular mineral has been hitherto only found in the cavities of a lead mine, near Castleton, in Derbyshire, called the Odin mine, accompanied by asphaltum.

SUBERIFORM MINERAL CAOUTCHOU. This substance, when recently cut, exactly resembles fine close cork in its colour and texture; but by exposure for a few days to the air, it becomes of a pale reddish brown colour. It is also sometimes found friable, and passing by decomposition into an ochraceous powder. It has only been found in a rivulet near the Odin mine, whence the preceding is obtained, and appears to differ from it, merely by being penetrated with water. It occurs in nodules of various sizes, some weighing upwards of 13 pounds, the nucleus of which is very commonly the brown perfectly elastic mineral caoutchou. Fourcroy Syst. vol. viii. Brochant. Mineralog. vol. ii. p. 58. Dict. d' Hist. Nat. art. *Bitumes*. Gren. Syst. Handbuch. vol. iii. p. i. Hatchet on Bitumens in Linnæan Trans.

BITURIGES Cubi, in *Ancient Geography*, the name of a people who occupied a considerable part of Aquitania Prima, and who had been much more powerful before Cæsar's conquest of Gaul, than they were afterwards. Livy says, that, in the time of Tarquin, they commanded the whole portion of Gaul called Celtic. Their capital was denominated *Avaricum*, which see. In the time of Cæsar, these people lost their power, and became subject to the Ædui, or at least were reduced to the necessity of putting themselves under their protection.

Bituriges *Vivisci*, a people who inhabited the southern part of Aquitania Secunda, and are supposed to have derived their origin from the Bituriges Cubi. Their capital was *Burdigala;* which see.

BITURIS, a town of Hispania Tarragonensis, in the country of the Vascones. Ptolemy.

BITYLA, a town of the Peloponnensus, not far from the Messenian gulf, S.W. of Sparta.

BITZLEER, Liwa, in *Biography*, a celebrated Jewish rabbi, who flourished in Bohemia about the close of the sixteenth century. He conversed with the emperor Rodolphus, and he was so famous, that the Jews said of him, that all Israel drank of his waters, and walked by his light. He founded the academy, called Klause, in 1592, which acquired such reputation in his time, that it drew a vast concourse of disciples to him. He was chosen at last superintendant of all the synagogues in Poland.

BIVALVE, *two-valved*, in *Conchology*, bivalviæ conchæ, one of the three principal sections, into which all testaceous animals are divided. The Linnæan genera of bivalve shells are mya, solen, tellina, cardium, mactra, donax, venus, spondylus, chama, arca, ostrea, anomia, mytilus, and pinna. The arrangement of bivalves by Cuvier, Lamarck, and other late naturalists differs materially from that of Linnæus and Gmelin. See Conchology.

Bivalve, is also applied, in *Botany*, to the *siliquæ*, or seed-pods, of such plants as open their whole length to discharge their seeds. Such are pea, beans, &c. which the botanists say, have bivalve or bivalvular siliquæ.

BIVAT, in *Conchology*, the name given by Adanson to the shell called by Linnæus (Syst. Nat. edit. 10.) *murex scabriusculus*; and *voluta cancellata*. Gmelin.

BIVENTER, from *bis* and *venter*, in *Anatomy*, a name given to muscles that have two fleshy portions, which were called bellies, and one tendon. Such muscles are also called *digastric*. The term biventer has been applied to a muscle of the lower jaw and os hyoides, which is described under its more common title of *digastricus*. Albinus also denominates a portion of the musculus complexus of the neck, biventer cervicis. See Complexus.

BIVERI, in *Geography*, a lake of Sicily, near Lentini, which in summer and autumn, renders the situation of this town very unwholesome. The waters of this lake, and of the neighbouring marshes and ponds, abound with eels and tench, of the roes of which the fishermen make a large quantity of botarga, a species of caviar; it is very salt, and has the taste of tar, but is much relished by the Sicilians.

BIVINCO, the principal place of a canton, in the department of Golo, and island of Corsica, the population of which consists of 1573 persons.

BIVIO. See Bevio.

BIVITTATUS, in *Entomology*, a species of Scarabæus (*Melolontha*), that inhabits Brasil. It is yellow and very glossy; on the head and thorax two common stripes, and many abbreviated green striæ on the wing-cases. Swederus Nov. Act. Stockh.

Bivittatus, a species of Curculio, found in St. Thomas's island. It is black; wing-cases striated with dots; marginal and dorsal interrupted stripe of yellow. Fabricius.

BIUMBRES, from *bis*, *double*, and *umbra*, *shadow*, in *Geography*, an appellation given to the inhabitants of the torrid zone, because at two different seasons of the year, their shadows are projected two different ways.

The biumbres are the same with those otherwise denominated *amphiscii*.

BIUMI, Paul Jerom, in *Biography*, born at Milan in 1663, studied medicine at Padua, where he was admitted to the degree of doctor in 1685. Returning thence to Milan, he soon acquired so much fame for his learning and skill in his profession, that in 1699 he was made professor of anatomy there, in which situation he continued to the time of his death, in 1731. He was author of several works, of which the following are most known: "Encomiasticon lucis, seu lucis encomia in physiologicis medicinæ novæ fundamentis e veterum tenebris erutis, atque cultro anatomico, autopsiæque caractere confirmatis," Mediol. 1701, 4to. "Scrutinio di Notomia e di Cirurgia," Milan, 1712, 8vo. Haller. Bib. Anat. et Med. Eloy. Dict. Hist.

BIVONA, in *Geography*, a town in the kingdom of Naples, and province of Calabria Ultra, 10 miles N. E. of Nicotera.

BIXA, in *Botany*. Lin. gen. 654. Reich. 710. Schreb. 887. Juss. 293. Gærtn. t. 61. Class and order, *Polyandria Monogynia*. Nat. Ord. *Columniferæ*; *Tiliaceæ*, Juss. Gen. Char. *Cal.* perianth five-toothed, very small, obtuse, flat, permanent. *Cor.* double; outer with petals five, oblong, equal, large, more rude; inner with five petals like the outer, but thinner. *Stam.* filaments numerous, setaceous, shorter by half than the corolla; anthers erect. *Pist.* germ ovate; style filiform, the length of the stamens; stigma parallely bifid, compressed. *Per.* capsule ovate-cordate, compressed, fenced with bristles, bivalve, gaping at the angles, one-celled, with an inner bivalve membrane. *Seeds* numerous, turbinate, with a truncated navel, berried. *Rec.* linear, longitudinal, fastened to the middle of the valves.

Ess. Char. *Cor.* ten-petalled. *Cal.* five-toothed. *Caps.* bispid, bivalve.

Species, 1. B. *Orellana*, arnotto, or anotta. Lin. Spec. 742. Reich. 2. 580. Hort. Cliff. 211. Mat. Med. 135. Gærtn fruct. 1. 292. Brown. jam. 254. B. Oviedi, l. 8. c. 6 Bauh. Hist. 1. 442. Clus. exot. 74. Orleana f. Orellana. Pluk. phyt. t. 209. f. 4. Comm. Hort. 1. 65. t. 33. Rocu. Merian. surin. t. 44. Urucu. Piso 133. Sloan. jam. 2. 52. t. 181. f. 1. Pigmentaria. Rumph. Amb. 2. 79. t. 19. Arbor Mexicana, fructu castaneæ, coccifera. Bauh. pin. 419. Raii hist. 1771. Achiotl. Hernandez. Mexic. 74. This shrub rises with an upright stem to the height of eight or ten feet, sending out many branches at top, which form a regular head. These are garnished with heart-shaped leaves, ending in a point, which have long footstalks, and come out without any order. The flowers are produced in loose panicles at the end of the branches, of a pale peach colour, having large petals. A native both of the East and West Indies. Introduced here in 1690 by Mr. Bentick.

Linnæus has adopted the South American vernacular name of bixa from Oviedo; and it is known by the same name in Holland, Denmark, and other northern countries. In Holland it is likewise called Orleane; in German, Anotta, &c. In England this name is adopted, but its orthography is various, as Arnotto, Arnotta, Anotta, Anato, Anoto, and Annoto. The French have adopted the Brasilian name, Uruhu, or Urucu, spelling it Roucouyer, Roucou, or Rocurier des Indes. The Portuguese have also the same

appellation Urucú, or Urucueira. In Spanish it is Anato, or Atolle. In the Mexican language, Achiotl. Scaliger calls it arbor finium regundorem, because the Mexicans made plans, and marked the boundaries of their lands on tablets, with the colour prepared from the berries. Tournefort named it Mitella, from the resemblance of the capsule, when open, to a mitre. For the preparation of the drug, and its uses, see ANNOTTO. The bark of the bixa makes good ropes for common use in the West Indies: and pieces of the wood are used by the Indians to procure fire by friction.

Propagation and Culture. This plant is propagated by seeds, may be easily cultivated, and is planted in many parts of Jamaica, Barbadoes, Cayenne, &c. in rich soils, and shady situations, shooting luxuriantly near rivulets. It is also propagated with us by seeds, which are annually brought in great plenty from the West Indies. These should be sown in a small pot filled with light rich earth, and plunged into a hot-bed of tanners' bark, where, with proper temperature, the plants will appear in about a month; when they are about an inch high, they should be taken out and separated without injuring their roots, and each planted in a pot of light rich earth, and plunged into a fresh hot-bed of tanners' bark, shading them every day till they have taken root; afterwards they should be treated like other plants of the same country, by admitting fresh air to them in proportion to the warmth of the season; and when the heat of the tan declines, it should be turned up to the bottom, and, if necessary, fresh tan be added to renew the heat. The plants must be refreshed with water three times a week in summer, but not in great quantities, as with much wet their roots would rot. Plants that are raised early in spring, and properly managed, will be a foot and a half high in autumn, when they should be removed into the bark stove, and plunged into the tan-bed. During the winter, they must have but little water, and while the plants are young, they should be kept warm; otherwise they will cast their leaves, lose their tops, and appear unsightly. They must be kept constantly in the bark stove; some of them rise seven or eight feet high, with strong stems and large heads; but seldom produce flowers in Europe. Martyn's Miller.

BIXÆ, in *Entomology*, a species of PAPILIO (*Pleb. Urb.*), with roundish, brown wings, greenish at the base, and a milky band on the under side of the posterior wings. Linn. Fabr. &c. Inhabits America.

BIZACIUM, in *Ancient Geography*. See BYZACIUM.

BIZAM, CHAT-BIZAM, in *Zoology*, the French name of the Linnæan *viverra tigrina*, which see.

BIZAMO, in *Geography*, a kingdom of Abyssinia, situate between the branches of the Nile, called the White and the Blue rivers, about N. lat. 10° 15'. and between 35° and 36° E. long.

BIZANTIA, a town of European Turkey, in the province of Moldavia, 40 miles south-west of Birlah.

BIZARRE, Fr. denoting *capricious*, &c. a term used among *Florists* for a particular kind of carnation, which has its flowers striped or variegated with three or four colours.

BIZE, in *Geography*, a town of France, in the department of the Aude, and district of Narbonne, 10 miles N.W. of Narbonne.

BIZERTA. See BISERTA.

BIZES, in *Ancient Geography*, a river of Bithynia, between Psillis and Rhebas. Ammian. Marcell.

BIZOCHI, or BISOCHI, in *Ecclesiastical History*, a sect or branch of religious minorites, condemned by several popes.

The Bizochi were also called *fratricelli*, or *fratres de paupere vita*: sometimes *Bichini* or *Bicchini*, and *Beguins*. The name is formed from *bisaccus*, on account of a double budget, or wallet, wherewith they begged their living. See BEGHARDI, and TERTIARIES.

BIZONE, in *Ancient Geography*, a city of Lower Mœsia, 80 stadia north of Dionysopolis, mentioned by Pliny (l. iv, c. 12.) as having been destroyed by an earthquake.

BIZONNES, in *Geography*, a town of France in the department of the Isere, and chief place of a canton; in the district of La Tour du Pin, 12 miles north-west of Moirans.

BIZU, a town of Africa, in the kingdom of Morocco, seated on a mountain in a fertile country, 25 leagues north of Morocco.

BIZYA, in *Ancient Geography*, a town of Thrace, and capital of the country called Astica, at some distance from the sea, N.W. of Salmydessus.

BIZYA, in *Geography*, a town of European Turkey, in Romania, 50 miles east of Adrianople.

BLACK, something opake and porous, that imbibes the greatest part of the light that falls on it, reflects little or none, and therefore exhibits no colour. See BLACKNESS.

Bodies of a black colour are found more inflammable, because the rays of light falling on them are not reflected outwards, but enter the body, and are often reflected and refracted within it, till they be stifled and lost. They are also found lighter, *cæteris paribus*, than white bodies, being more porous. It may be added, that clothes dyed of this colour wear out faster than those of any other, because their substance is more penetrated and corroded by the vitriol necessary to strike their dye, than other bodies are by the galls and alum which suffice for them.

The inflammability of black bodies, and their disposition to acquire heat, beyond those of other colours, are easily evinced. Some appeal to the experiment of a white and black glove worn in the same sun; the consequence will be a very sensibly greater degree of heat in the one hand than the other. Others allege the phænomena of burning-glasses, by which black bodies are always found to kindle soonest; thus, a burning-glass, too weak to have any visible effect at all upon white paper, will readly kindle the same paper rubbed over with ink. Mr. Boyle gives other proofs still more obvious: he took a large tile, and having whited over one half of its superficies, and blacked the other, exposed it to the sun; where having let it lie a convenient time, he found, that whilst the whited part remained still cool, the black part was grown very hot. For farther satisfaction the same author has sometimes left on the surface of the tile a part retaining its native red, and exposing all to the sun, has found the latter to have contracted a heat in comparison of the white part, but inferior to that of the black. So also on his exposing two pieces of silk, one white, the other black, in the same window to the sun, he often found the latter considerably heated, when the former has remained cool. It is observable likewise, that rooms hung with black are not only darker, but warmer than others. Boyle's Works abridg. tom. i. p. 144. and tom. ii. p. 36. To all which may be added, that a virtuoso of unsuspected credit assured Mr. Boyle, that, in a hot climate, he had, by carefully blackening the shells of eggs, and exposing them to the sun, seen them thereby well roasted in a short time.

Dr. Watson, the present bishop of Landaff, covered the bulb of a thermometer with a black coating of Indian ink, in consequence of which the mercury rose ten degrees. Phil. Transf. vol. lxiii. part 1. p. 40.

Black clothes heat more, and dry sooner in the sun, than white clothes. Black is therefore a bad colour for clothes in hot climates; but a fit colour for the linings

of ladies' ſummer hats. Dr. Franklin's Experiments, Obſervations, &c. 5th edit. p. 483, & ſeq. He obſerves alſo, ibid. p. 382, that a chimney painted black, when expoſed to the ſun, will draw more ſtrongly. We may add, that black mould is a hotter ſoil for vegetables; and garden-walls, painted black, anſwer better for the ripening of wall-fruit, than thoſe of lighter colours.

Black, in matters of dreſs, is the diſtinguiſhing habit of churchmen and mourners. Some will have it, that the common people among the Romans were clothed in black; whence the denomination given them of *turba pullata*.

Black, Joseph, in *Biography*, a celebrated teacher of chemiſtry, was born at Bourdeaux, in France, in the year 1728. His father, who was a native of Belfaſt, in Ireland, but of a Scotch family, carried on the wine trade at Bourdeaux, and lived in intimacy with the famed baron Monteſquieu, who expreſſed his regret in ſtrong terms on Mr. Black's quitting Bourdeaux, when he retired from buſineſs, as appears by ſeveral of his letters which are preſerved by the family. By his mother, Dr. Black was nearly related to the wives of Dr. Adam Fergulon, and Mr. James Ruſſel, profeſſor in natural philoſophy at the univerſity of Edinburgh, and owed probably much of his knowledge to the inſtruction or information he obtained from them. In the year 1740, his father ſent him to Belfaſt, that he might have the education of a Britiſh ſubject; and from his letters, he appears to have been ſatisfied with the progreſs he made there. In 1746, he went to Glaſgow, where he applied to the ſtudy of medicine, but particularly to chemiſtry, into the knowledge of which he was initiated by Dr. Cullen, who then gave lectures there on that branch of ſcience. Under his direction he made ſuch progreſs, that, in 1756, when Dr. Cullen removed to Edinburgh, Black, who had previouſly taken his degree of doctor, ſucceeded him as profeſſor in medicine, and lecturer in chemiſtry. That he was qualified to fill this office, he had ſhewn by an ingenious eſſay, containing experiments to inveſtigate the nature of magneſia, quicklime, and ſome other alkaline ſubſtances, recommended as ſolvents of the ſtone in the bladder. In the courſe of theſe experiments he demonſtrated the exiſtence of an aërial fluid, which he called fixed air, the preſence of which gave mildneſs, and its abſence cauſticity, to alkalies and calcareous earth; a diſcovery which laid the foundation of the improvements ſince made in our knowledge of gaſes, or aërial bodies, by Prieſtley, Cavendiſh, Lavoiſier, and other chemiſts. The eſſay, containing the account of theſe experiments, was publiſhed in the ſecond volume of "Eſſays phyſical and literary," in 1756. The following year he further enriched his favourite ſcience with his experiments on latent heat, which is found to exiſt in all bodies; explaining in a ſatisfactory manner the connection of heat and fluidity, by which he ſo eſtabliſhed his reputation, that on Dr. Cullen's being promoted from the chemical to the medical chair at Edinburgh, in 1765, he was unanimouſly choſen to ſucceed him as profeſſor in chemiſtry there. His time was now dedicated, and with increaſed ardour, to imparting the knowledge he had acquired to his numerous pupils; and as he was perfectly maſter of the ſubjects on which he lectured, his doctrines were ſo clearly explained, as to be eaſily underſtood by his auditors, many of whom took complete copies of his lectures. By this means the knowledge of the diſcoveries he had made, became widely diffuſed, and his claim to them ſecured to him, which might otherwiſe have been aſſigned to thoſe who improved and extended them. Having thus laid the ground-work for the improvement of the art, he ſeems to have been contented, without attempting to puſh his diſcoveries further. Satisfied with the attention paid him by his pupils, and the gradual extenſion of his fame, of which he received daily proofs, he took little notice of what Prieſtley, Lavoiſier, and other philoſophical chemiſts, were doing, or only noticed them when they had neglected making thoſe acknowledgments to him he knew to be his due. Dr. Robiſon, who had been his pupil, and has lately publiſhed his lectures, with an account of his life, attributes this apparent apathy to the ill ſtate of his health, which, for ſeveral years before his death, did not permit that degree of application and ſtudy, which the farther extenſion of his diſcoveries would have required. "The ſlighteſt cold," he ſays (Preface to the Lectures, p. lx.), "the moſt trifling approach to repletion, immediately affected his breaſt, occaſioned feveriſhneſs, and, if continued two or three days, brought on a ſpitting of blood. In this ſituation nothing reſtored him but relaxation from thought, and gentle exerciſe. The ſedentary life, to which ſtudy confined him, was manifeſtly hurtful; and he never allowed himſelf to indulge in any intenſe thinking, or puzzling reſearch, without finding theſe complaints ſenſibly increaſed." Hence, though he had the honour of being elected one of the foreign aſſociates of the royal academy of ſciences at Paris, and member of the imperial academy at Peterſburgh, he ſent no communications to either of thoſe learned ſocieties. As he ranked high among the teachers of chemiſtry, and his name and character were extended over Europe, his pupils were numerous, and continued increaſing for the whole time he lectured, more than thirty years. In the year 1774, he ſent to the Royal Society in London, his obſervations on the effect of boiling upon water, in diſpoſing it to freeze; and, in 1791, the Royal Society at Edinburgh publiſhed his analyſis of the waters of ſome hot ſprings in Iceland, in the third volume of their Tranſactions. In this paper, which is drawn up with great accuracy, he treats of the formation of the ſilicious ſtone, which is depoſited by theſe ſprings. His conſtitution becoming more and more feeble, from the frequent returns of his complaint, he was firſt obliged to make uſe of an aſſiſtant in his lectures, and at length, to give them up altogether; the ſmalleſt exertion bringing on a fit of hæmoptoe. "But he ſeemed," Dr. Robiſon ſays (Preface, p. 73.), "to have his complaint almoſt under command, ſo that he never allowed it to proceed far, or to occaſion any diſtreſſing illneſs, and ſo ſpun his thread of life to the laſt fibre, guarding againſt illneſs by reſtricting himſelf to a moderate diet, and meeting his increaſing infirmities with a proportional increaſe of attention and care." On the 26th of November 1799, and in the 71ſt year of his age, he died ſuddenly, without any previous warning. Being at table, with his uſual fare before him, ſome bread, a few prunes, with milk and water for his drink, having the cup in his hand, reſting on his knees, he expired ſuddenly in that poſture, the cup remaining in his hand, and his countenance ſo compoſed and placid, that his ſervant at firſt imagined he was fallen aſleep. He was of a chearful and ſociable diſpoſition, and, as his mind was well ſtored with knowledge, an entertaining companion. His company was therefore much courted; and, as his circumſtances were affluent, he dedicated as much of his time to the pleaſures of ſociety, as was conſiſtent with his avocations. He was never married; he therefore left the principal part of his fortune, which is ſaid to have been conſiderable, among the children of his brothers and ſiſters. Gen. Biog. Dict. Lectures of the Elements of Chemiſtry.

Black, in *Heraldic Engravings*, is expreſſed by croſs lines, and in emblazoning, is termed for commoners *ſable*, for peers *diamond*, and for ſovereigns and princes *ſaturn*.

Black, in the *Manege*. A horſe of a deep, ſhining, and

and lively black is called a *black-more*, or *coal-black*. Horſes black all over are commonly reckoned dull and melancholy; but a white foot, or ſtar in the forehead, gives them a degree of ſprightlineſs. The Spaniſh gravity is ſaid to be beſt pleaſed with thoſe entirely black.

Black, *blue*, in the *Manufactures and Arts*, is the coal of ſome kind of wood, or other vegetable matter, burnt in a cloſe heat, where the air can have no acceſs: the beſt ſort is ſaid to be made of vine-ſtalks and tendrils. The goodneſs of blue-black conſiſts in the cleanneſs and blue caſt of its black colour, and the perfect degree of its levigation.

That this preparation, which is ſold in the colour-ſhops, is no other than a vegetable coal, appeared from the following experiment of Dr. Lewis. (Comm. Phil. Techn. p. 358.) Laid on a red hot iron, it burned and glowed like powdered charcoal, and turned into white aſhes; which aſhes, thrown into oil of vitriol diluted with water, very readily diſſolved into a bitteriſh liquor, the characteriſtic by which the vegetable earth is diſtinguiſhed. From what particular vegetable matter this blue-black is procured, experiments, he ſays, cannot diſcover: but it appears from thoſe which he recites, that it may be obtained from many, and that the choice of the vegetable ſubject affects rather the ſoftneſs or hardneſs than the colour of the coal. Blue-black, perfectly good, may be prepared in the manner directed for *ivory* Black, from the vine ſtalks, or tendrils, or any other twigs of wood, of an acid taſte and tough texture; but the ſoaking in the oil, preſcribed for the ivory, muſt be omitted.

The painters have *blue-blacks*, *brown-blacks*, &c. which may be made by mixing pigments of the reſpective colours, with ſimple black ones, in greater or leſs quantity, according to the ſhade required. The dyers alſo have different blacks, and often darken other colours by ſlightly paſſing them though the black dying liquor; but the term brown-black is in this buſineſs unknown, brown and black being here looked upon as oppoſite to one another. In effect, the colour called brown-black is no other than that which all dyed black clothes change to in wearing; and therefore it is no wonder that it ſhould be excluded from the catalogue of the dyers' colours. The true or ſimple blacks, mixed with white, form different ſhades of grey, lighter or darker, according as the white or black ingredient prevails in the mixt. The black pigments, ſpread thin upon a white ground, have a like effect. Hence the painter, with one true black pigment, can produce on white paper, or on other white bodies, all the ſhades of grey and black, from the ſlighteſt diſcolouration of the paper up to a full black; and the dyer produces the ſame effect on white wool, ſilk, or cloth, by continuing the ſubjects for a ſhorter or longer time in the black bath, or making the bath itſelf weaker or ſtronger.

M. le Blon, in his "Harmony of Colours," formsbla k by mixing together the three primitive colours, blue, red, and yellow; and Mr. Caſtel, in his "Optique des couleurs," publiſhed in 1740, ſays, that this compound black has an advantage in painting above the ſimple ones, of anſwering better for the darkening of other colours. Thus if blue, by the addition of black, is to be darkened into a *blue-black*, the ſimple blacks, if uſed in ſufficient quantity to produce the requiſite deepneſs, conceal the blue, while the compound blacks leave it diſtinguiſhable. Le Blon has not mentioned the proportions of the three primitive colours neceſſary for producing black. Caſtel directs 15 parts of blue, five of red, and three of yellow; and he obſerves, that the colours ſhould be the deepeſt and darkeſt of their reſpective kinds, and that a combination ſhould be made to ſeveral pigments for each colour; for the greater the contraſt of heterogeneous and diſcordant drugs, the more true and beautiful will be the black, and the more capable of uniting with all other colours, without ſuppreſſing them, and even without making them tawney. Dr. Lewis, in his experiments, has not ſo far ſucceeded as to obtain a perfect black by mixing different blue, red, and yellow powders; but he procured very dark colours, ſuch as brown-blacks and grey-blacks.

Black, *bone*, is made of the bones of bullocks, cows, &c. well burnt and ground. To be good, it muſt be ſoft and friable, of a gloſſy caſt. It is in conſiderable uſe, though inferior in goodneſs to ivory-black.

The invention of bone, or ivory-black, is attributed to Apelles. Plin. Hiſt. Nat. lib. xxxv. cap. 5.

Black *chalk*. See Chalk, and Killow.

Black *charcoal*. See Charcoal, and Crayons.

Black, *curriers*, ſignifies a teint or dye laid on tanned leather. Tanned leather is ſo much impregnated with the aſtringent parts of oak bark, or with that matter which ſtrikes a black colour with green vitriol, that rubbing it over three or four times with a ſolution of the vitriol, or with a ſolution of iron made in vegetable acids, is ſufficient for ſtaining it black. Of this we may be convinced by dropping a little of the ſolution on the unblacked ſide of common ſhoe-leather. This operation is performed by the currier, who, after the colouring, gives a gloſs to the leather with a ſolution of gum-arabic and ſize made in vinegar. Where the previous aſtringent impregnation is inſufficient to give a due colour, and for thoſe ſorts of leather which have not been tanned, ſome galls or other aſtringents are added to the ſolution of iron; and in many caſes, particularly for the finer ſorts of leather, and for renewing the blackneſs, ivory or lamp-black is uſed. A mixture of either of theſe with linſeed oil, makes the common oil-blacking. See Currying.

Black, *dyers*, is one of the five ſimple and mother colours uſed in dyeing: and given differently, according to the different quality and value of the ſtuffs to be dyed. See Dyeing.

Green vitriol ſtrikes a black colour with vegetable aſtringents, and hence it is the baſis of the black dye for cloth, leather, hats, &c. And as ſolutions of iron with galls, &c. produce the ſame colour, a method is derived from hence of diſtinguiſhing the minuteſt portions of iron in mineral waters, &c. Neumann.

The ſubſtances chiefly employed for producing black colour with vitriol are galls. When a decoction or infuſion of the galls is dropped into a ſolution of the vitriol largely diluted with water, the firſt drops produce bluiſh or purpliſh red clouds, which mingling with the liquor tinge it uniformly of their own bluiſh or reddiſh colour. This difference of the colour, ſays Dr. Lewis (Com. Ph. Tech. p. 346.), ſeems to depend on the quality of the water. With diſtilled water, or the common ſpring waters, the mixture is always blue. A minute quantity of alkaline ſalt previouſly diſſolved in the water, or a ſmall degree of putridity in it, will render the colour of the mixture purple or reddiſh. Rain-water received from the clouds, in clean glaſs veſſels, gives a blue, but if it be collected from the tops of houſes, gives purple with the vitriol and galls. Both the blue and purple liquors, when more of the aſtringent infuſion is added, deepen to a black, more or leſs intenſe, according to the degree of dilution; and if the mixture be a deep opake black, it again becomes bluiſh or purpliſh when further diluted. If it be ſuffered to ſtand in this dilute ſtate for two or three days, the colouring matter ſettles to the bottom in form of a fine black mud, which, by ſlightly ſhaking

ſhaking the veſſel, is diffuſed again through the liquor, and tinges it of its former colour. When the mixture is of a full blackneſs, this ſeparation does not happen, or in a far leſs degree, for though a part of the black matter precipitates in ſtanding, yet ſo much remains diſſolved, that the liquor continues black. This ſuſpenſion of the colouring ſubſtance in the black liquid may be attributed in part to the gummy matter of the aſtringent infuſion increaſing the conſiſtence of the watery fluid, for the ſeparation is retarded in the diluted mixture by a ſmall addition of gum arabic. If the mixture, either in its black or diluted ſtate, be poured into a filter, the liquor paſſes through coloured, only a part of the black matter remaining on the paper. The filtered liquor, on ſtanding for ſome time, becomes turbid, and full of fine black flakes; but being freed from theſe by a ſecond filtration, it again contracts the ſame appearance, and thus repeatedly, till all the colouring parts are ſeparated, and the liquor has become colourleſs. The colouring matter, thus ſeparated from the liquor, being drained on a filter and dried, appeared of a deep black, which did not ſeem to have ſuffered any change on being expoſed to the air for upwards of four months. When it was made red hot, it glowed and burnt, though without flaming, and became a ruſty brown powder, which was readily attracted by a magnetic bar; though in its black ſtate, the magnet had no action upon it. The vitriolic acid, diluted with water, and digeſted on the black powder, diſſolved the greateſt part of it, leaving only a very little quantity of whitiſh matter. Solution of pure fixt alkaline ſalt diſſolved very little of it; the liquor received a reddiſh brown colour, and the powder became blackiſh brown. This reſiduum was attracted by the magnet after being made red-hot, though not before; the alkaline tincture, paſſed through a filter, and mixed with ſolution of gum vitriol, ſtruck a deep browniſh black colour, nearly the ſame with that which reſults from mixing with the vitriolic ſolution an alkaline tincture of galls. For an account of the reſult of theſe experiments, ſee Lewis, *ubi ſupra*. See alſo IRON.

For broad-cloths, ne ratines, and druggets, &c. the dyers uſe woad and indigo; the goodneſs of the colour conſiſts in there not being above ſix pounds of indigo to a ball of woad, when the latter begins to caſt its blue flower; and, in its not being heated for uſe above twice. Thus blued, the ſtuff is boiled with alum, or tartar, then maddered; and laſtly, the black given with galls, copperas, and ſumac. To bind it, and prevent its ſmearing in uſe, the ſtuffs are to be well ſcoured in the fulling mill, when white, and well waſhed afterwards.

For ſtuffs of leſs value, it is ſufficient they be well blued with woad, and blacked with galls and copperas; but no ſtuff can be regularly dyed from white into black, without paſſing through the intermediate blue.

Yet there is a colour called *coal black*, or *Jeſuit's black*, prepared of the ſame ingredients as the former, and ſufficient of itſelf without the blue dye. Here the drugs are diſſolved in water that had boiled four hours, and ſtood to cool till the hand would bear it; then the ſtuff is dipped in it, and again taken out ſix or eight times. Some even prefer this black to the other. This method of dyeing black is ſaid to have been invented by the Jeſuits, and to have been practiſed in their houſes, where they retained numbers of dyers.

By 23 El. c. 9. nothing of the nature of cloth ſhall be maddered for a black, except it be firſt grounded with woad only, or with woad and ancle [blue ind.], unleſs the madder be put in with ſumac or galls; on pain of forfeiting the value of the thing dyed; provided it ſhall be lawful to dye any manner of gall-black, and ſumac-black [*plain black*], wherein no madder ſhall be uſed.

Logwood ſtrikes a black with chalybeate ſolutions and is employed with thoſe liquors for ſtaining wood black, as picture frames, &c. With the addition of galls, it is uſed for dyeing cloth and hats black. (Neumann's Works, p. 385.) This black colour is not permanent, though beautiful, any more than the natural violet dye of the *logwood*.

Black may be alſo obtained by a ſolution of ſilver in aqua fortis, when the previous matter ſtained with this liquor is expoſed for ſome time to the ſun and air; and alſo from ſolutions of lead in acids, when the ſubjects to which they are applied are expoſed to ſulphureous vapours, or waſhed over with alkaline ſolutions of ſulphur. Calces of lead, melted with ſulphur, form a bluiſh or blackiſh maſs, uſeful in taking caſts from medals. (See CASTS.) Beſides, when a ſolution of ſilver in aqua fortis is added to a ſolution of ſulphur made in alkaline ley, the ſilver and ſulphur unite and precipitate together in the form of a black powder. See DYEING, and STAINING.

BLACK, *earth*, is a kind of coal found in the ground, which, well pounded, is uſed by painters in freſco. See *Pit*-COAL, and FRESCO.

There is alſo a kind of black made of ſilver and lead, uſed to fill up the ſtrokes and cavities of things engraved.

BLACK, *German*, or *Frankfort*, is made of the lees of wine burnt, then waſhed in water, and ground in mills for that purpoſe, together with ivory or peach ſtones burnt. Some ſuppoſe, that it is the coal of vine-twigs; but this, ſays Dr. Lewis (Com. Phil. Techn. p. 377.), does not appear to differ, in any great degree, from that of the ſmall branches of other kinds of trees; but the kernels of fruits yield a coal conſiderably more ſoft and mellow, eaſily crumbling between the fingers into a fine meal. That the Frankfort black is no other than a vegetable coal, appeared, from its burning on a red-hot iron, like charcoal powder, into white aſhes, and from the aſhes, like common vegetable aſhes, being plentifully diſſoluble by the vitriolic acid into a bitteriſh liquor, while the aſhes of animal ſubſtances are very ſparingly affected by that acid, and form with it a compound of a different kind of taſte.

This black makes the principal ingredient in the rolling-preſs printers' ink, which ſee. It is ordinarily brought from Frankfort, Mentz, or Straſbourg, either in lumps or powder. That made in France is more valued than that of Germany.

BLACK *glaſs*. See GLASS.

BLACK, *harts*, that which remains in the retort after extracting the ſpirit, ſalt, and oil of hartſhorn. This reſidue being ground up with water, makes a black not much inferior to that of ivory.

BLACK, *Indian*. See *Indian* INK.

BLACK, *ivory*, is made of ivory burnt or charred, ordinarily between two crucibles well luted; which, being thus rendered perfectly black, and in ſcales, is ground in water, and made into troches, or little cakes, uſed by the painters; as alſo by the jewellers to blacken the bottom or ground of the collets, wherein they ſet diamonds to give them their teint or foil. Some recommend ſoaking the chips or ſhavings of ivory in hot linſeed oil, before it is charred.

There are particular machines and contrivances for burning the ivory for theſe purpoſes, by which the colour is rendered more beautiful than that of the coal which remains in the diſtillation. Neumann.

The goodneſs of ivory-black, which is the fineſt of all the charcoal blacks, may be perceived by its fulneſs, without a blue caſt; and by the fineneſs of the powder.

In the manufacture of this black much impofition is practifed, fo that what is generally fold under this name is no other than the coal of common bones. Being applied to coarfe purpofes, and fold at a low price, it is very grofsly levigated by the hand or horfe-mills which are employed in grinding the bones, and fo much adulterated with charcoal duft, which gives it a blue caft, that it is wholly exploded from delicate ufes, and lamp-black, though inferior with regard to the purity and clearnefs of the black colour, fubftituted for it.

The following recipe is given in the Handmaid to the Arts (vol. i. p. 140.) for preparing it in perfection. Take plates, chips, or fhavings of ivory, and foak them in hot linfeed oil; or, if filings are more eafily procured, they may be ufed moiftened with the hot oil. Put them into a veffel, which will bear the fire, covering them with a fort of lid made of clay and fand; which fhould be dried, and the cracks repaired before the veffel be put into the fire. Let this veffel be placed in a tobacco-pipe maker's or potter's furnace, or any other fuch fire; and let it remain there during one of their heats. When it is taken out, the ivory will be properly burnt; and muft be afterwards thoroughly well levigated on the ftone with water, or to have it perfectly good, be alfo wafhed over. The ivory may be conveniently burnt in a calcining or fubliming furnace.

An opake deep black for water colours is made by grinding ivory-black with gum-water, or with the liquor which fettles from the whites of eggs after they have been fuffered to ftand a little. Some ufe gum water and the whites of eggs together, and they fay, that a fmall addition of the latter makes the mixture flow more freely from the pencil, and improves its gloffinefs. It may be obferved, however, that though ivory-black makes the deepeft colour in water, as well as in oil-painting, yet it is not on this account always to be preferred to other black pigments. A deep jet-black colour is feldom wanted in painting; and in the lighter fhades, whether obtained by diluting the black with white bodies, or by applying it thin on a white ground, the particular beauty of the ivory-black is in a great meafure loft.

Black, *lamp*, or *lam* Black, originally perhaps the foot collected from lamps, is generally prepared by melting and purifying refin or pitch in iron veffels; then fetting fire to it under a chimney, or other place made for the purpofe, lined a-top with fheep-fkins, or thick linen cloth, to receive the vapour or fmoke, which is the black: in which manner they prepare vaft quantities of it at Paris. In England confiderable quantities are prepared, particularly at the turpentine-houfes, from the dregs and refufe parts of the refinous matters which are there manufactured; but the greateft part is brought from Germany, Sweden, and Norway. Its preparation is defcribed in the Swedifh Tranfactions for 1754, as a procefs dependent on the manufacture of common refin.—The impure refinous juice, collected from incifions made in pines and fir-trees, is boiled down, with a little water, and ftrained, whilft hot, through a bag: the dregs and pieces of bark, left in the ftrainer, are burnt in a low oven, from which the fmoke is conveyed, through a long paffage, into a fquare chamber, having an opening in the top, in which is faftened a large fack, made of fleafy or thin-woven woolly ftuff; the foot, or lamp-black, concretes partly in the chamber, from which it is fwept out once in two or three days, and partly in the fack, which is now and then gently ftruck upon, both for fhaking down the foot, and for clearing the interftices between the threads, fo as to procure a fufficient draught of air through it. The more curious artifts prepare lamp-black for the nicer purpofes, by hanging a large copper pan over the flame of a lamp with a long wick, fupplied with more oil than can be perfectly confumed, fo as to receive its fmoke. Soot collected in like manner from fir and other woods, by burning fmall pieces of them fowly under a copper pan, is of a deeper black colour than fuch as is obtained from the fame kinds of wood in a common chimney, and little inferior to that of oils. The foot of mineral bitumens, in this clofe way of burning, appears to be of the fame qualities with thofe of woods, oils, and refins. In fome parts of Germany, it is faid, great quantities of good lamp-black are prepared from a fort of pit-coal.

The goodnefs of lamp-black lies in the fulnefs of the colour, and in its being free from duft or other impurities. The lightnefs of the fubftance furnifhes the means of difcovering any adulteration, if to a great degree; as the bodies with which lamp-black is fubject to be fophifticated, are all heavier in a confiderable proportion.

This fubftance is ufed on various occafions, particularly in the printers' ink; for which it is mixed with oils of turpentine and linfeed, all boiled together.

It muft be obferved, that this black takes fire very readily, and when on fire is very difficultly extinguifhed: the beft method of putting it out is with wet linen, hay, or ftraw; for water alone will not do it.

A glafs tube clofely filled with lamp-black has been found to conduct a confiderable charge of electricity inftantaneoufly, and with fcarce any explofion. But a coating of this fubftance, mixed with tar or oil, is a perfect non-conductor, and has proved a prefervative from lightning, by repelling the electric matter from thofe parts of the mafts of fhips which have been covered with it.

Ruffian lamp-black is prepared from the foot of fir, and is collected at Ochta near St. Peterfburg, Mofcow, Archangel, and other places, in little wooden huts, from refinous fir wood, and the unctuous bark of birch, by means of an apparatus uncommonly fimple, confifting of pots without bottoms, fet one upon another, and is fold very cheap. It is three or four times more heavy, thick, and unctuous, than that kind of painters' black which the Germans call "kienrahm," and which is called in Ruffia "Holland's black." For an account of the fpontaneous accenfion of Ruffian fir-black, impregnated with hemp-oil, fee *Spontaneous* Inflammation.

A *mineral lamp-black* may be procured from pit-coal, or any kind of mineral or foffil coal, by preferving the blackeft particles of the fmoke arifing from it in ignition. Mr. Wm. Row of Newcaftle-upon-Tyne obtained a patent in 1798 for his method of manufacturing this kind of lamp-black. See the fpecification in the Repertory of the Arts, &c. vol. x. p. 81.

Black *paint*. See Paint.

Black *fand*. See Sand.

Black *fealing wax*. See Wax.

Black, *foot*, or *chimney*, is a poor colour; but ready for painting black draperies in oil. The foot blacks are in general much fofter and of a more yielding texture than thofe of the charcoal kind, and require much lefs grinding, for uniting them with oily, watery, or fpirituous liquors, into a fmooth mafs; of fome of them a part is diffolved by water, or fpirits of wine, while none of the charcoal blacks have been found to contain any thing diffoluble. This foluble matter of foots, however, is not black like the indiffoluble parts; and in this particular, as well as in the colour of the entire mafs, different forts of foot differ from one another. Thus the foot of pit-coal collected in common chimneys, of itfelf rather greyifh black than of a full black, being

being infused separately in rectified spirit of wine, and in water, tinged the former of a transparent reddish colour, and the latter of a paler reddish; while the deeper black soot of wood gave, both to spirit and to water, an opake, dark brown. See SOOT.

BLACK, *Spanish*, so called, because first invented by the Spaniards, and most of it bought from them, is no other than burnt cork used in various works, particularly among painters.

BLACK *stains*. See STAINING.

BLACK *varnish*. See VARNISH.

BLACK *vegetable juice*. See ANACARDIUM.

BLACK *Act. Waltham*, in *Law*, a name commonly distinguishing the statute of 9 Geo. I. c. 22. because it was occasioned by the devastations committed near Waltham in Essex, by persons in disguise, or with their faces *blacked*. By this statute it is enacted, that persons hunting, armed and disguised, and killing or stealing deer, or robbing warrens, or stealing fish out of any river, &c. or any persons unlawfully hunting in his maj-sty's forests, &c. or breaking down the head of any fish-pond, or killing, &c. of cattle, or cutting down trees, or setting fire to house, barn, or wood, or shooting at any person, or sending letters, either anonymous, or signed with a fictitious name, demanding money, &c. or rescuing such offenders, are guilty of felony, without benefit of clergy. This act is made perpetual by 31 Geo. II. c. 42. See farther 6 Geo. II. c. 37. and 27 Geo. II. c. 15. Blackstone's Comm. vol. iv. p. 144. 208. 232. 244. The milder punishment inflicted by stat. 16 Geo. III. c. 30. against deer-stealers, has been thought a virtual repeal of the punishment of the black act above-recited. Leach's Hawk. P. C. i. c. 49. § 7.

BLACK *bay*, in *Geography*, a bay on the south-east coast of Labrador. N. lat. 51° 30′. W. long. 56° 20′.

BLACK *bear*, in *Zoology*. See URSUS ARCTOS.

BLACK-*bellied darter*, and BLACK-*bellied anhinga* of Latham, in *Ornithology*, is *Plotus Melanogaster* of Gmelin.

BLACK-*bellied grosbeak* of Brown's Illustrations, is *Loxia afra* of Gmelin.

BLACK-*bellied green humming-bird* of Edwards; BLACK-*bellied American humming-bird* of Bancroft; and BLACK-*bellied humming-bird* of Latham, are all the same bird; namely, *Trochilus holosericeus* of Linn. and Gmel.

BLACK-*berry*, in *Botany*. See RUBUS.

BLACK *billed auk* of most English writers, in *Ornithology*, is *Alca pica* of Linn. Syst. Nat. and Fabricius.

BLACK-*billed tropic bird*, so named in Latham's Synopsis, is *Phaëton melanorhynchos* of Gmelin.

BLACK-*billed whistling duck* of Sloane and Brown's Jamaica, is called *Anas arborea* by Gmelin.

BLACK-*bird*. The proper acceptation of this word among the English writers of the present time, is very clearly understood; the *Turdus merula* of Linnæus and other naturalists being alone implied. The earlier ornithologists of this country are much less precise in the application of this word: with them, birds of the same natural order were sometimes called black-birds, because they bear a remote resemblance to the common species most familiarly known by that name, as we find, for instance, in the two kinds of turdus, torquatus, and roseus, both of which are called, in a general manner, black-birds, white-ringed black-birds, rose-coloured black-birds and the like. Thus far, indeed, there existed a striking natural affinity between the species, because they all belong to the same natural order, and were, in reality, of the family they called merula, which seems to have been considered in certain instances synonymous with black-bird. But all the early writers did not confine themselves to such minute distinctions as the generic character afforded: the *black-bird* (razor-billed) of Catesby, being, for example, of a very dissimilar genus to that of our common black-bird; namely, the *crotophaga* of modern writers. Again, the *black-bird* (red-breasted Indian) of Willughby, is one of the *oriolus*; the *black-bird* (red-breasted) of Edwards, belongs to the *tanagra*; and the *black-bird*, or *Chinese starling* of the same author, is a *gracula*. Birds of the sparrow, titmouse, and other kinds, altogether remote from the former, were also called occasionally black-birds. We may, therefore, easily perceive that the word black-bird was an indefinite term, applied, for the most part, to those birds whose plumage is of a black colour, without regard to the natural order to which they ought to have been referred, although sometimes employed to express only that which we still distinguish by the name of black-bird. See TURDUS MERULA.

BLACK-*book* of the *Exchequer*, *Eagle*, *Hellebore*, *Money*, *Order*, *Star*. See the several articles.

BLACK-*books*, a name given to those which treat of necromancy, or, as some call it, nigromancy.

The black-book of the English monasteries, was a detail of the scandalous enormities practised in religious houses, compiled by order of the visitors under king Henry VIII. to blacken them, and thus hasten their dissolution.

BLACK-*breasted grebe* of Latham, in *Ornithology*, is *Colymbus thomensis* of Gmelin.

BLACK-*breasted grosbeak* of Latham, is *Loxia Americana* of Gmelin.

BLACK-*breasted humming-bird* of Latham, is spoken of by Buffon under the name of *Hausse col vert*; Gmelin calls it *Trochilus gramineus*.

BLACK-*breasted Indian plover* of Edwards, is a variety of CHARADRIUS SPINOSUS of Gmelin. The female of this bird is called by Edwards the *spur-winged plover*, a name retained by Latham for both sexes. In Russel's Aleppo it is called the *lapwing*.

BLACK-*breasted thrush*. Latham describes *Turdus cinnamomeus* of Gmelin, under this name in the synopsis of birds.

BLACK-*breasted titmouse* of Latham, is *Parus afer* of Gmelin.

BLACK-*breasted wood-pecker* of Latham, is *Picus multicolor* of Gmelin.

BLACK-*bulfinch* of Albin, like *Pyrrhula nigra* of Brisson, and *Bouvreuil noir* of Buffon, is nothing more than an accidental variety of the common bulfinch, or *Loxia pyrrhula* of Latin writers. The bulfinch occurs sometimes of a white colour, as well as black or dusky.

BLACK-*bulfinch*, (*Little*) of Catesby and Albin, and BLACK *grosbeak* of Latham, is *Loxia nigra* of Gmelin.

BLACK-*canker*, in *Agriculture*, a disease in turnip and other crops, produced by a species of caterpillar destroying their leaves.

It is observed by Mr. Young, in the second volume of the Annals of Agriculture, that "these insects were effectually destroyed by Mr. Coke, at Holkham, in Norfolk, by turning a number of ducks among the turnips when injured by insects. On the 16th of July, says he, they were turned into thirty-three acres, having water at one corner of the field, and, in five days, they cleared the whole most completely, marching at last through the field on the hunt, eyeing the leaves on both sides with great care to devour every

every one they could see, and filling their crops several times in the day. The ducks, after having saved about sixty pounds' worth of turnips, were sent to the poultry yard." With this view, it has been suggested by Mr. Middleton in his "Survey of the county of Middlesex," that this sort of poultry may often be kept with advantage by the farmer.

Black-*canons*, in *Ecclesiastical History*, a name given to the regular canons of St. Augustine, who wore a black mantle over their surplice, by way of distinction from the *Præmonstratenses*.

Black-*cap* of the English, in *Ornithology*, the *Motacilla atricapilla* of Linnæus. The same name is given likewise to the *marsh titmouse*, *Parus palustris* of Linn. and the *black-headed gull*, *Larus atricilla* of Gmelin.

Black-*cap* of Ceylon, or *Ceylon black-cap*, the name of *Motacilla zeylonica* of Gmelin, in Brown's Illustration of Nat. Hist.

Black-*capped humming-bird* of Latham, and *Long-tailed black-cap humming-bird* of Edwards and Bancroft, are *Trochilus polytmus* of Gmelin.

Black-*capped king's-fisher* of Latham, is *Alcedo atricapilla* of Linn.

Black-*capped lory*, the English name given by Latham to the *Gmelinian psittacus lory*. This is the first black-cap lory of Edwards.

Black-*capped manakin* of Edwards and Latham, is *Pipra manacus* of Gmelin.

Black-*cape*, in *Geography*, lies on the east coast of Newfoundland, S. E. from cape St. Francis.

Black-*cattle*, in *Agriculture*, a small, hardy breed of cattle, mostly of a black colour, occupying the high or more mountainous districts in the northern parts of the island. They are covered with a long close coat of hair, of much the same kind as the polled and long horned breeds. They feed readily in the rich pastures in the southern parts of the kingdom, where large quantities of them are annually driven and fed for sale in the London and other markets. Their beef is generally of a fine grain, well marbled, and of a good flavour; but sometimes not so fine and bright in its external appearance as that of other sorts of cattle, being occasionally, except when made very fat, spotted with black, even upon the choicest parts. From their property of becoming quickly fat, and not being of great weight, they seem well adapted to the low, rich, grazing districts in the southern counties, where the lands are liable to be poached and injured by the heavier breeds of cattle. They seldom weigh more than from twenty to thirty stone each, though some particular ones have become considerably heavier. See Cattle and Live-Stock.

Black-*cheeked eagle*, of Latham's Synopsis, in *Ornithology*, is *Falco Americanus* of Gmelin.

Black-*cheeked thrush* of Latham, is *Turdus nigerrimus* of Gmelin.

Black-*chin grebe* of Pennant, &c. *Colymbus lebridicus* of Gmelin.

Black-*cock* of Pennant, Latham, Donovan, &c. is *Tetrao tetrix* of Linnæus. The same bird is also well known by the name of *black-game*, or *black-grous*.

Black-*cockatoo* of Latham, and *Great black cockatoo* of Edwards, is called by Buffon *Kakatoës noir*, and by Gmelin *Psittacus ater rimus*.

Black-*collared finch* of Latham, is *Fringilla Abyssinica* of Gmelin.

Black-*crowned bunting* of Latham, is *Emberiza atricapilla* of Gmelin.

Black-*crowned manakin* of Latham, is *Pipra atricapilla* of Gmelin.

Black-*crowned oriole*, the English name of *Oriolus Mexicanus* of Linn. in Latham's "Synopsis of Birds."

Black-*crowned plover* of Arct. Zool. is *Charadrius atricapillus* of Gmelin.

Black-*crowned shrike* of South America is *Lanius Americanus* of Gmelin.

Black-*crowned tanager* of Latham, is *Tanagra melanicterа* of Gmelin.

Black-*Indian cuckow* of Edwards, is *Cuculus niger* of Linn.

Black-*diver*, or *scoter*, of English ornithologists, is *Anas nigra* of Linn. Fn. Suec.

Black-*dolphin*, in *Agriculture*, a small insect which is frequently very destructive to bean, turnip, and some other crops. Where beans are attacked with these insects, the best remedy probably is, as soon as they are first perceived, to cut off the tops by means of a scythe, as they are found to make their first lodgments, principally in those parts of the plants. See Fly and Turnips.

Black *duck* of Latham and other writers, in *Ornithology*, is called by Edwards the *great black duck* from Hudson's bay. This is a very distinct species from the *black duck* of Ray and Willughby, and *velvet duck* of modern naturalists. Gmelin calls it *Anas perspicillata*.

Black-*duck*, or *Great black duck* of Ray and Willughby, is the *velvet duck* of later English authors, and *Anas fusca* of the Linnæan Fauna Suecica.

Black *eagle*, in *Heraldry*, an order of knighthood instituted in Prussia, by Frederic I. 14th Jan. 1701. The ensign of the order is a gold cross of eight points, enamelled blue; in the centre whereof are the letters F. R. in cypher, and in the four angles the eagle of Prussia, enamelled black. On collar days, it is worn pendant to a rich collar of gold, composed of round pieces of gold, each enamelled with four cyphers of the letters F.R.; in the centre of the piece is set a large diamond, and over each cypher a regal crown, all richly chased, intermixed with eagles displayed, enamelled black alternately, and holding in their claws thunderbolts of gold.

The cross of the order is worn, on ordinary days, pendant to a broad, orange-coloured ribbon, across the left shoulder. The knights have embroidered on the left breast of their coats a star of silver, like that of the ensign of the order, in the centre of which is an eagle displayed black, holding in his dexter claw, a chaplet of laurel, and in the other a thunderbolt, with the motto *Suum cuique* round it. See Plate of *Heraldry*.

Black-*eagle* of Willughby, in *Ornithology*, is *l'Aigle commune* of Buffon, and *Falco melanaëtos* of Gmelin.

Black-*ears*, or Black-*eared lynx*, in *Zoology*, called also the *Persian lynx*, and *Black-eared cat*, is the *Sigah gush* or *Siyah gush* of Charleton, and *Caracal* of Buffon. Gmelin mentions this animal under the name of *Felis caracal*. See Caracal, and Sigah Gush.

Black-*earth*, in *Agriculture*, that kind of earth or mould which contains a large portion of carbonaceous or vegetable matter in its composition. Soils of this sort are capable of producing most sorts of grain and other vegetable crops in abundance. See Soil, &c.

Black-*eunuchs*, in the *Custom of Eastern Nations*, are Ethiopians castrated, to whom their princes commonly commit the care of their women. See Eunuch.

Black-*eye*, in *Botany*, a name given to the germ in beans, which the Romans called hilum. See Germ.

Black-

Black-*eye*, *hypofphagma*, in *Medicine*, a fuffufion of blood on the *tunica adnata*, turning livid, occafioned by a blow. See Ecchymosis.

Black-*faced bunting* of Latham, in *Ornithology*, is *Emberiza quelea* of Gmelin.

Black-*faced finch* of the Arctic Zoology is *Fringilla criftata* of Gmelin.

Black-*faced ibis* of Latham, is *Tantalus melanopis* of Gmelin.

Black-*fifh*, in *Ichthyology*, the name under which *Silurus anguillaris* is defcribed in Ruffel's "Hift. of Aleppo." This fifh has a fingle dorfal fin containing feventy rays, and eight beards at the mouth, namely, two on the upper lip, four on the lower one, and two on each fide of the mouth. There is likewife a kind of perch mentioned by Borlafe as being found in the rivers of Cornwall, which he calls the black fifh. Pennant fpeaks of it on the authority of that writer; and Gmelin, after him, gives it as a fpecies with fome doubt. This fpecies meant by Borlafe is certainly ambiguous. See Perca Nigra.

Black-*fly*, in *Agriculture*, an infect of the beetle tribe, that often commits great devaftation among turnip and other crops, deftroying the young plants, by feeding upon their feed-leaves the moment they are protruded and appear above ground. Different remedies have been propofed for the prevention of the deftructive ravages of this infect on turnips, but few of them have been attended with much fuccefs. The beft method is probably, that of fowing the feed at fuch a feafon, and under fuch circumftances, as that its early vegetation may be quick and uninterrupted, and thereby allow little time for the infects to feed upon the plants, before they become in broad leaf, and capable of refifting its injurious attacks. See Fly and Turnips.

Black-*fly-catcher* of Latham, in *Ornithology*, is *Mufcicapa luzoniefis* of Gmelin.

Black-*forefl*, *mountains of*, in *Geography*, called in German Schwartzwald, extend from near Neuenburg, in the territories of Wurtemburg, fouth to the four forefl towns on the Rhine. The fouthern part is called the high, and the northern the lower forefl; the length being about 80 Britifh miles. To the eaft the Necker may be confidered as a boundary, and the breadth may be computed at about 20 Britifh miles. The eaftern part prefents a gradual elevation, while the weftern exhibits precipitous fummits to the inhabitants of Baden and Alface. The appellation feems to be derived from the thick dark forefts with which the afcents are clothed. Befides pafturage, the inhabitants, partly fubject to Auftria, and partly to Wurtemburg, derive advantage from the refin of the pines, and the timber, of which they make all kinds of utenfils. Some parts are cultivated by fpreading branches of pine, covered with fod, which, being burnt, affords an excellent manure, that prepares the ground for four abundant harvefts. A branch of the black mountains fpreads eaft from near Sulz, on the Necker, towards the county of Oftingen, being more than 60 miles in length. This chain is called the Alb, and fometimes the Suabian Alps. Bufching traces this ridge from the north-eaft, the fource of the Brenz, to the weft of the Nerefheim, by Wifenfteig, where the mountains are higheft. Thence they turn north-weft to Guttenberg, and weft to Neiffen, whence they pafs by Hohenzollern to the Necker, then bend fouth and weft between that river and the Danube. Bufching adds, that as this chain rifes infenfibly at Konigfbrown north-eaft, fo it gradually terminates at Ebingen fouth-weft. The principal fummits are in the north and weft of the ridge; and the forefts are chiefly beech; while the open fpaces fupply pafturage for numerous flocks of fheep. Of thefe two extenfive ridges of mountains, the Black Forefl and the Alb, a confiderable portion pervades the duchy of Wurtemburg; and near Stutgard, the capital, are the mountains of Boyferfteig, Weinfteig, and Hafenfteig. The conftituent parts of thefe extenfive ridges have been little detailed; but a great part is calcareous, as they fupply excellent marbles. Near Frudenftadt, in the black mountains, are mines of filver and copper.

Black-*footed pinguin*, or *penguin*, *leffer pinguin*, *cape pinguin*, *&c.* in *Ornithology*, are different Englifh names of an individual fpecies of Aptenodyta in the works of Edwards, Latham, &c. Gmelin names this bird fpecifically *demerfa*.

Black-*fox*, in *Zoology*. See Canis Lycaon.

Black-*fronted fly catcher* of Latham, in *Ornithology*, is *Mufcicapa nigrifrons* of Gmelin.

Black-*fryers*, in *Ecclefiaftical Hiftory*, a name given to the Dominican order, called alfo *Predicants* and *Preaching fryers*; in France, *Jacobins*.

Black-*game*, in *Ornithology*. See Black-*Cock*.

Black-*grafs*, in *Agriculture*, a fpecies of American grafs, growing in meadows which border on tide-rivers, well fupplied alfo with frefh water; for a mixture both of frefh and falt water feems to be neceffary for its prolific vegetation. Its feeds are fmall, like thofe of tobacco; its colour a deep green; and it affords from three to four tons of hay by the acre. This kind of grafs thrives beft on a clay or ftrong loam; nor is the vicinity of falt water abfolutely neceffary. The feeds have been lately brought over into England, and diftributed for trial in proper foils.

Black-*grofbeak* of Edwards, in *Ornithology*, and the *Angola grofbeak* of Latham are the fame; *Loxia angolenfis* of Gmelin.—*Obf.* The *black grofbeak* of Latham is another bird; *Loxia nigra* of Gmelin.

Black-*guillemot* of Pennant and other Englifh writers of the prefent times, is the *Greenland dove*, or *fea-turtle* of Albin, Ray, Willughby, and *Colymbus grylle* of Linnæus.

Black-*headed bunting* of Latham, is *Emberiza melanocephala* of Scopoli.

Black-*headed creeper* of Latham, and the *Green black-cap fly-catcher* of Bancroft, are of the fame fpecies, the latter being only a variety of the firft. Linnæus calls this kind *Motacilla fpiza*.

Black-*headed duck* of Shaw's travels, has been fince named the *Damiatta duck* by Latham, and *Anas Damiatica* by Gmelin in the Linn. Syft. Nat.—The variety of *Anas bofchas*, or *wild duck*, called *nigra*, from having the head and collar black, might be alfo called the *black-headed duck*.

Black-*headed finch* of Latham, is *Fringilla melanocephala* of Gmelin.

Black-*headed fly-catcher*, of Arctic Zoology: and *black-cap fly-catcher* of Catefby, is the *mufcicapa fufca* of Gmelin.

Black-*headed grofbeak* of Latham, is *loxia erythromelas* of Gmelin.

Black-*headed gull*, the Englifh name of *larus rubicundus*. The fame bird is alfo called the *pewet black-cap*, or *fea crow*, by Ray and Willughby.

Black-*headed Indian icterus* of Albin and Edwards, is *fturnus luteolus* of the tenth edition of the Linn. Syft. Nat. and *oriolus melanocephalus* of Gmelin.

Black-*headed nut-hatch*, a variety of the common nut-hatch found in Carolina and Jamaica. Buffon and Arct. Zool. *Sitta Europæa* of Gmelin.

Black-*headed plover* of Latham, is *charadrius melanocephalus* of Gmelin.

Black-*headed shrike*, a species of *lanius*, so called by Latham: it is the *lanius melanocephalus* of Gmelin.

Black and *spotted heath-cock* of Edwards, and *spotted grous* of Pennant and Latham, are *tetrao canadensis* of Gmelin. —*Obs.* There is another black and spotted heath-cock figured also by Edwards, pl. 71, which, in the 12th edition of the Linnæan Syst. Nat. is called *tetrao canace*.

Black *heron* of Latham, is the *ardea atra* of Gmelin.

Black-*hooded wheat-ear* of Latham, is *motacilla pileata* of Gmelin.

Black-*humming-bird*; the Linnæan, *trochilus niger* is so named in the Synopsis of Latham.

Black *jacana*; the *jacana armata nigra* of Brisson, and *parra nigra* of Gmelin, bears this name in Latham's Synopsis.

Black-*jack*, or *Blend*, is a mineral, called also false galena and blinde, &c.

Black-*jawed warbler* of Latham, in *Ornithology*, is *motacilla nigrirostris* of Gmelin.

Black-*island*, in *Geography*, an island near the coast of America, belonging to the state of Rhode island. N. lat. 41° 7′. W. long. 71° 35′.

Black *islands*, islands near the east coast of Labrador. N. lat. 41° 8′. W. long. 56° 30′.

Black *kite*, or *black-gled* of Sibbald, is *falco ater* of Gmelin, and *milvus niger* of Brisson.—*Obs.* Gmelin mentions a black variety of falco communis under the specific name of *ater*; it was previously described by Edwards under the name of *black hawk* or *falcon*.

Black *land*, in *Agriculture*, a name given to a sort of soil which has a greyish black cast. This sort of soil, though pale when dry, always blackens by means of rain; and when ploughed up at such times, it sticks to the plough share; and the more it is wrought the muddier and darker-coloured it appears. These sorts of land, when somewhat rich, yet porous, light but sufficiently tenacious, are good both for corn and grass; but as they are mostly situated in bottoms, the wetness often spoils them for corn; but when they are dry, they are extraordinarily fruitful, especially for barley; they also bear good wheat crops. When they are very rich, they may, if a deep mould, be planted with liquorice, or sown with hemp, woad, cole, or rape, madder, and other similar plants, that best suit such lands; and afterwards with corn, when some of their fertility is expended. They are capable of bearing excellent clover crops. The best manure for these soils is chalk or lime, where it can be procured.

Black *lark*, in *Ornithology*. Albin describes an accidental variety of the common lark, *alauda arvensis*, under this name, in the third volume of his History of Birds.

Black *lead*, in *Mineralogy*, &c. See Lead and Plumbago.

Black *leather*, in the *Manufactures*, is that which has passed the curriers' hands, where from the russet as it was left by the tanners, it is become black, by having been scowered and rubbed three times on the grain-side with copperas-water.

Black *legs*, a name given in Leicestershire to a disease frequent among calves and sheep. It is a kind of jelly, which settles in their legs, and often in the neck, between the skin and flesh.

Black *legs*, an appellation given to those gamblers and sharpers who prey upon the ignorance and credulity of inexperienced and unsuspecting persons of property, with whom they contrive to associate, and who subsist in dissipation and luxury on the spoils acquired by deception and fraud, in a variety of games and sports which they frequent for this purpose. They are justly denominated the pest of civilized society, and should be shunned by those who have any concern for their property or reputation, as the most dangerous and destructive enemies.

Black *lick*, in *Geography*, lies in Westmorland county, Pennsylvania, about 36 miles east of Pittsburg.

Black *lory*, of Latham, in *Ornithology*, is *psittacus novæ Guineæ* of Gmelin.

Black *mail*, in *English Antiquity*, a certain rate of money, corn, cattle, or other matter, anciently paid by the inhabitants of towns in Westmorland, Cumberland, Northumberland, and Durham, to diverse persons inhabiting on or near the borders, being men of name, and allied with others in those parts, known to be great robbers and spoil-takers; in order to be by them freed and protected from any pillage. Prohibited as felony, by 43 El. c. 13.

The origin of this word is much contested, yet there is ground to hold the word *black* to be here a corruption of *blank* or white, and consequently to signify a rent paid in a small copper coin called *blanks*. This may receive some light from a phrase still used in Picardy, where, speaking of a person who has not a single halfpenny, they say, *il n' a pas une blanque maille*. The term is also used for rents reserved in work, grain, or baser money, which were called "reditus nigra" in contradistinction to the blanch farms, "reditus albi."

Black *martin*, or *swift* of the English, in *Ornithology*, is the *hirundo apus* of Latin writers.

Black *monks*, in *Ecclesiastical History*, a denomination given to the Benedictins, called in Latin *nigri monachi*, or *nigromonachi*; sometimes *ordo nigrorum*, the order of *blacks*.

Black *mountains*, in *Geography*. See Black-*Forest*. This is also a denomination given to an extensive ridge of mountains in South-Wales, separating the boundaries of the counties of Glamorgan and Brecknock; covered in summer with black-cattle and sheep.

Black-*necked quail* of Latham, in *Ornithology*, is *tetrao nigricollis* of Gmelin.

Black-*necked swan* of Pennant and Latham, stands under the name of *anas nigricollis* in the Gmelinian edition of Syst. Nat.

Black-*necked thrush* of Latham, is *turdus nigricollis* of Gmelin.

Black *ness*, in *Geography*, a foul point on the coast of France, and in the English channel, four leagues W. from Calais.

Black *oats*, in *Agriculture*, a species of oats much cultivated in the northern parts of England, and esteemed a very hearty food for horses. See Oats.

Black *oriole*, of the Arctic Zoology, and Latham's Synopsis, in *Ornithology*, is the *icterus niger* of Brisson, and *oriolus niger* of Linn. and Gmel.

Black *oriole (Lesser)*, the English name of *oriolus minor*, in Latham's Synopsis.

Black *ostrich* of Brown's Illustrations, &c. is *struthio camelus* of Scopoli, Gmelin, &c.

Black *parrot* of Latham, and *black parrot* of Madagascar, and of Edwards, are the same; the *psittacus niger* of Gmelin.

Black *petrel* of Latham, and *great black petrel* of Edwards, stands under the name of *procellaria æquinoctialis* in Gmelin's edition of the Linn. Syst. Nat.

Black *poll warbler* of Latham, is *motacilla striata* of Gmelin.

Black *point*, and *blue point*, in *Geography*, capes of America, within those of Elizabeth and Porpoise, in the district of Maine.

Black *point*, is also a point on the west coast of Africa, between cape Cavallos, and cape Palmas.—Also, a point

S. E. from cape Chidley, the north point of the Labrador coast. N. lat. about 59° 20′.—Also, a point on the coast of Spitsbergen, or East Greenland. N. lat. 78° 30′. E. long. 11° 10′. Variation 10° 42′. W.

Black *pool* lies on the coast of Lancashire, about 25 miles S. from Lancaster. The beach is a beautiful level sand, with an extended sea before it. This place is frequented for summer bathing.

Black *procession*, in *Ecclesiastical Writers*, that which is made in black habits, and with black ensigns and ornaments. See Procession.

Antiently at Malta, there was a *black procession* every Friday, where the whole clergy walked with their faces covered with a black veil.

Black *rail* of Latham, in *Ornithology*, is the *rallus niger* of Gmelin.

Black *rat*, in *Zoology*. See Mus Rattus, or *Common rat*.

Black *red-tail* of Latham, in *Ornithology*, is the *motacilla atrata* of Gmelin.

Black *rents*. See Black *mail*.

Black *River*, in *Geography*, an appellation applied to two small rivers, in Vermont, America; one falling into Connecticut river, at Springfield, and the other running north into lake Memphremagog.—Also a river in New York, which interlocks with Canada creek, and runs northwest into Iroquois river, navigable with boats 60 miles.—Also, a long river, which rises in Virginia, and passes southeasterly into Nottaway river, in North Carolina.

Black *River*, a British settlement at the mouth of the Tinto river, 20 leagues to the east of cape Honduras, the only harbour on the coast of Terra Firma, from the island of Rattan to cape Gracias a Dios; and for more than sixty years it was the refuge of the logwood cutters, when the Spaniards drove them from the forest of East Yucatan. This occasioned adventurers of different descriptions to settle here, where the coast is sandy, low, and swampy; but higher up, near the rivers and lagoons, which are full of fish, the soil is more fertile, and produces plantanes, cocoa-trees, maize, yams, potatoes and a variety of vegetables; and the passion for drinking induced them to plant sugar-canes. The forests are full of deer, swine, and game. The shores abound with turtle, and the woods with mahogany, zebra-wood, sarsaparilla, &c.; and the whole settlement flourishes spontaneously without cultivation.

Black *River*, a river of Jamaica, which passes through a level country, and is the deepest and largest in the island, so as to admit flat-bottomed boats and canoes for about 30 miles.

Black *Rock*, a rock in the mouth of Sligo harbour, in Ireland, which is covered about high water only, and has a conspicuous tower built on it that serves as a beacon.

Black *Rock*, a Rock in the bay of Galway, in Ireland, about three miles westward of Galway, which dries with spring-tide only, and requires attention in navigating that bay. M'Kenzie.

Black *Rocks*, rocks in the Atlantic ocean, near the west coast of Ireland, about six miles N. W. from Saddlehead, in Achil isle, and seven miles W. by S. from Blacksod point.—There are rocks called by the same name in Killibeg's bay and Mulroy haven, but they are less objects of attention to the navigator. M'Kenzie.

Black *Rock*, a rock near the south coast of Wexford, in Ireland, about four miles W. by S. of Carnsore point, which is always above water, and may be sailed round without danger. M'Kenzie. Boate.

Black *Rock*, a populous village, situate on the river Tawe, about a mile above Swansea, in Glamorganshire, South Wales, where are considerable smelting-houses, and whence are exported coals, &c.

Black *Rock* lies also near the extreme north point of the island of Antigua, between Humphrey's bay and Boon point. N. lat. 17° 5′. W. long. 61° 58′.

Black-*rod*. See Gentleman Usher *cf.*

Black-*row grains*, in *Mineralogy*, a species of iron-stone, or ore, found in the mines about Dudley, in Staffordshire.

Black *Sea*, in *Geography*. See Euxine *Sea*.

Black *sheep*, in *Oriental History*, the ensign or standard of a race of Turkmans settled in Armenia and Mesopotamia, hence called the *dynasty of the black sheep*.

Black *shrike* of Latham, in *Ornithology*, is *lanius niger* of Gmelin.

Black *Mexican siskin* of Latham, is *fringilla catotol* of Gmelin.

Black *skimmer* of Latham, *cut-water* of Arct. Zool., *sea crow* of Edwards, are all names of the same bird; the *Rynchops nigra* of Gmelin.

Black *squirrel* of Catesby, is the *sciurus niger* of Erxleben and Gmelin.

Black *stones* and *gems*, according to Dr. Woodward, owe their colour to a mixture of tin in their composition.

Black *strakes*, a range of planks immediately above the wales in a ship's side: they are always covered with a mixture of tar and lamp-black.

Black *swallow* of Latham, in *Ornithology*, is the *hirundo apus dominicensis* of Brisson, and *hirundo nigra* of Gmelin.

Black *swan*. A bird of this description inhabits Botany Bay. Its form resembles that of the common white swan; but the prevailing colour of the plumage is black, instead of white; the wings are edged with white; and the bill is red. This species is described by Dr. Shaw (Nat. Miscell.) under the name of *anas atrata*. It is the *black swan* of several writers who have lately treated on the history of Botany Bay.

Black *tail*, a beacon about 3 leagues distant from the Nore in the river Thames.

Black *Tanager* of Latham, in *Ornithology*, is the *emberiza atra* of the 10th edition of the Linn. Syst. Nat. and *tanagra atrata* of Gmelin.

Black *tern* of modern writers, is the *scarecrow* of the old English ornithologists, and *cloven-footed gull* of Willughby. *Sterna fissipes* of Brünnich and Gmelin.

Black-*thorn*, in *Botany*, a species of the *prunus*, which see.

Black-*thorn*, in *Agriculture*, a species of thorn well known, and frequently used in making fences, especially in exposed situations. It is not, however, reckoned so good for fences as the white-thorn, because it is apt to run more into the ground, and is not so certain of growing; but when cut, the bushes are much the best, and most lasting of any, for dead hedges, or to mend gaps with. Cattle are not so apt to crop fences of this kind as those of the white-thorn sort. See Hedges.

Black-*throated barbet* of Latham, in *Ornithology*, is *bucco niger* of Gmelin.

Black-*throated bunting* of the Arct. Zool. is *emberiza Americana* of Gmelin.

Black-*throated diver* of Pennant and others, is the same bird as Edwards calls the *speckled loon*, and Willughby *Wormius's northern ducker*; *Colymbus arcticus* of Linnæus.

Black-*throated green fly-catcher*, of Edwards's Gleanings, and *green warbler* of Latham; the *motacilla virens* of Gmelin.

Black-

Black-*throated tanager*, of Latham, the *tanagra nigricollis* of Gmelin.

Black-*throated manakin* of Latham, the *pipra nigricollis* of Gmelin.

Black *throated thrush* of Latham, is *turdus ater* of Gmelin.

Black *throated warbler*, of the Arctic Zoology, is *motacilla Canadensis*, of Gmelin.

Black *tiger*, in *Zoology*. See Felis Discolor.

Black-*tin*, in *Mineralogy*, a denomination given to the tin-ore when dressed, stamped, and washed ready for the blowing-house, or to be melted into metal. Phil. Trans. No. 69. p. 2110.

It is prepared into this state by means of beating and washing; and when it has passed through several buddles or washing-troughs, it is taken up in form of a black powder, like fine sand, called *black tin*.

Black-*toed gull* of Pennant, Latham, Walcot, &c. in *Ornithology*, is the *larus crepidatus* of Hawkesworth and Gmelin.

Black-*toed petrel*. The Gmelinian *procellaria melanopus* is described under this name in Latham's Synopsis of Birds.

Black *town*, in *Geography*, a settlement of 1200 free negroes, erected in 1783, about a mile from the town of Shelburne, in Nova Scotia.

Black *twitch*, in *Agriculture*, a noxious weed, probably the *polygonum convolvulus*, which flourishes even in extremely dry seasons, and is very injurious to many crops.

Black *vomit*, in *Medicine*, a disease to which the inhabitants of Spanish North America are subject, said to be allied to the yellow fever of the United States, and which, at intervals, ravages the country like a pestilence. See Fever.

Black *vulture* of Willughby and Latham, in *Ornithology*, is *vultur niger* of Ray, Brisson, and Gmelin.

Black *vulture* (*crested*) of Edwards, the *vultur monachus* of Gmelin.

Black *woodpecker*, (*greatest*), Albin, Donovan, &c. the *picus martius* of Linn. Fn. Suec.

Black *wadd*. See Wadd.

Black-*winged parrakeet* of Brown's Illustrations, in *Ornithology*, is called by Gmelin *psittacus melanopterus*.

Black-*winged thrush* of Latham, is *turdus bambla* of Gmelin.

Black *and white butcher-bird*. Under this title the Linnæan *lanius doliatus* is described and figured by Edwards in his History of Birds. Latham calls it the *pied shrike*.

Black *and blue creeper* of Edwards's Gleanings, the *certhia cyanea* of Gmelin.

Black *and violet creeper* of Latham, is *certhia Brasiliana* of Gmelin.

Black *and white creeper* of Edwards, and *small black and white bird* of Ray and Sloane, are *motacilla varia* of Gmelin.

Black *and white king's fisher* of Edwards and Latham, is the *alcedo rudis* of Gmelin.

Black *and white wagtail* of Ray, is the *pied wagtail* of Latham, *motacilla maderaspatana* of Brisson, and *motacilla maderaspatensis* of Gmelin.

Black, *white, and red Indian creeper* of Edwards, is the *certhia cruentata* of Linn. and Gmel.

Black *and yellow creeper*. *Certhia flaveola* of Gmelin is described under this name both by Edwards and Latham.

Black *and yellow daw* of Brasil. Edwards under this title describes a variety of *oriolus Persicus*, Linn.

Black *and white diver* (*small*) of Willughby and Edwards, is *alca alce* of Linnæus. This bird is likewise called the *Greenland dove*, or *sea turtle*, by Albin; and is known among later writers by the name of the *little auk*. Pennant. Donov. Brit. Birds, &c.

Black *and white dobchick* of Edwards, is the *dusky grebe* of later writers; *Colymbus obscurus* of Gmelin.

Black *and white duck* (*little*) of Edwards, and *spirit* of Arct. Zool., are *anas albeola* of Gmelin.

Black *and white Indian falcon*, the English name of *falco melanoleucus* (Gmel.) in Pennant's Indian Zoology, and Latham's Birds.

Black *and orange finch* of Latham, and *small black and orange bird* of Sloane and Ray, is *fringilla melanictera* of Gmelin.

Black *and white fly-catcher* of Edwards's Gleanings, is *muscicapa bicolor* of Gmelin.

Black *and white gull* of Ray, Willughby, and Albin, is the *black-backed gull* of modern ornithologists. Linnæus calls it *larus marinus*.

Black *and blue humming-bird* of Bancroft, is called by Gmelin *trochilus cyanomelas*.

Black *and yellow manakin* of Edwards, is the variety β of the Gmelinian *pipra aureola*.

Black *and orange-coloured bird* (*small*) of Ray and Sloane, is *motacilla ruticilla* of Linnæus, and *muscicapa ruticilla* of Gmelin. This is likewise the *black-headed warbler* of Latham, *small American redstart* of Edwards, and *yellow-tailed fly-catcher* of Edwards's Gleanings.

Black *and white Chinese pheasant* of Edwards. This is *phasianus nycthemerus* of Scopoli and Gmelin. It is likewise called the *pencilled pheasant* by Latham and other late writers.

Black *and yellow frizzled sparrow* of Edwards's Gleanings, is the *frizzled finch* of Latham, and *fringilla crispa* of Gmelin.

Black *and white starling* of Willughby, is *sternus leucomelas* of Brisson, which Gmelin gives as a variety of the common stare, or starling, *sturnus vulgaris* of Linnæus.

Black *and white Indian starling* of Edwards. This is *sturnus contra* of Gmelin.

Black *and blue tanager* of Latham, is the *black and blue titmouse* of Edwards, and *tanagra Mexicana* of Gmelin.

Black *whytlof*, in our *Old Writers*, bread of a middle fineness betwixt white and brown, called in some parts *ravel-bread*.

In religious houses, it was the bread made for ordinary guests, and distinguished from their household loaf, or *panis conventualis*, which was pure manchet, or white bread.

Black-*work*, iron wrought by the blacksmith; thus called by way of opposition to that wrought by whitesmiths.

BLACKALL, Offspring, in *Biography*, an English prelate, was born at London, in 1654, and educated at Catherine hall, in the university of Cambridge. Besides several promotions in London, he was appointed one of the chaplains in ordinary to king William, though his principles were adverse to the revolution government, and he refused for two years to take the requisite oaths to king William and queen Mary. On the 30th of January 1699, he preached a sermon before the house of commons, in which he animadverted on a passage in Mr. Toland's life of Milton, who, after stating the proofs that Dr. Gauden, afterwards bishop of Exeter, was the true author of the book entitled "Icon Basilike," and ascribed to Charles I., observes, that many supposititious pieces, under the name of Christ, his apostles, and other great persons, were published and approved in the primitive times. But as Mr. Toland, in his Amyntor, published in the same year, avowed his belief of the

the genuineneſs of the books of the New Teſtament, Mr. Blackall cloſed the diſpute by the publication of a ſmall pamphlet in 12mo. entitled "Reaſons for not replying to a book lately publiſhed, entitled Amyntor." In 1700 he preached a courſe of ſermons at Boyle's Lecture, publiſhed in the firſt volume of the collection of thoſe ſermons. In 1707, he was promoted to the ſee of Exeter; and in 1709, he was engaged in a controverſy with Hoadly, concerning the inſtitution of civil government, and the meaſures of ſubmiſſion. With reſpect to this controverſy it is ſufficient to obſerve, that the biſhop defends the high-church, tory principles, as they are uſually called, of the divine inſtitution of magiſtracy, and unlimited paſſive obedience, and non-reſiſtance, which Hoadly oppoſes. This prelate, whoſe private character, and ſtyle of preaching, are highly extolled by ſir William Dawes, archbiſhop of York, in the preface to his Sermons, died at Exeter, Nov. 29th, 1716. His ſermons were collected and publiſhed in 2 vols. folio, Lond. 1723. Gen. Dict. Biog. Brit.

BLACKAMOOR'S HEAD, in *Chemiſtry*, conſiſts of a conical veſſel, ſurrounded with another of a cylindrical form, filled with cold water, and having a cock to draw it off, when it is become too warm. Both veſſels are made of copper. In the figure, one half is left open to ſhew the cone; the inclination of the ſides of which, according to Chaptal, is moſt proper, when forming an angle of 75 degrees with the baſe. See *Plate* of *Chemiſtry*.

BLACKBALL HEAD, in *Geography*, a cape on the S.W. coaſt of Ireland, at the north ſide of the entrance into Bantry bay in the county of Cork. N. lat. 51° 32′. W. long. 9° 55′. M'Kenzie and Beaufort.

BLACKBURN, WILLIAM, in *Biography*, an eminent ſurveyor and architect, was born in Southwark, Dec. 20, 1750, and having acquired ſome knowledge of his profeſſion, in the ordinary courſe of education, he was admitted a ſtudent at the Royal academy. By this academy he was preſented in 1773, with the medal for the beſt drawing of the inſide of St. Stephen's church in Walbrook; and the delivery of it by the preſident, ſir Joſhua Reynolds, was accompanied by a diſtinguiſhed tribute of reſpect to his abilities. About this time he entered into buſineſs in the place of his nativity; but a circumſtance occurred in a few years which ſerved to eſtabliſh his reputation, and to introduce him into very general notice. In 1779 an act of parliament was paſſed for the erection of places of confinement, under the denomination of "penitentiary houſes." Two edifices of this kind were propoſed to be conſtructed; one for the confinement and employment of 600 males, and the other for the accommodation of 300 females. The three ſuperviſors firſt authoriſed by his majeſty for carrying into effect the proviſions of this act, were John Howard eſq., George Whatley eſq., and Dr. John Fothergill. The death of Dr. Fothergill, and the reſignation of Mr. Howard, diſſolved this commiſſion; and the charge was devolved, in 1781, on ſir Gilbert Elliot, ſir Charles Bunbury, and Thomas Bowdler eſq. The principal object of the plan propoſed was to combine, in the buildings to be erected, ſolitary confinement, with uſeful labour and moral reformation. Accordingly premiums were announced to thoſe who ſhould produce the beſt plans. The higheſt premium of 100 guineas was unanimouſly aſſigned, in 1782, to Mr. Blackburn. In conſequence of this diſtinction, he was appointed by the ſuperviſors to the office of architect and ſurveyor of the projected buildings. The deſigns of government, after ſeveral preparatory ſteps had been taken, were never accompliſhed. However ſchemes of a ſimilar kind were projected in various parts of the country, and the execution of them was entruſted to Mr. Blackburn. Whilſt he was buſily employed in the completion of various deſigns of this kind, and whilſt he was proſecuting a journey to Scotland, for the purpoſe of erecting a new gaol at Glaſgow, he died ſuddenly, Oct. 28th, 1790, at Preſton in Lancaſhire; and his remains were removed to London, and interred in the burying ground of Bunhill-fields.

Mr. Blackburn's ſkill as a draughtſman and an architect, was not confined to priſons and penitentiary houſes; but he was occupied, as far as his time would allow, in preparing various deſigns for churches, houſes, villas, &c.; and in his drawings and deſigns he always manifeſted a correct taſte, and a thorough knowledge of the ſcience to which he was practically devoted. His friends, and the public in general, very juſtly lamented, that by the corpulence to which he was inclined from his early youth, and the increaſe, of which no abſtinence, nor any mode of regimen, would reſtrain, he was removed from a ſcene of uſefulneſs and reputation, at ſo early a period as the 40th year of his age. As to his religious profeſſion, he was a proteſtant diſſenter of the preſbyterian denomination; but he combined with an undiſguiſed and laudable avowal of his own ſentiments, the moſt liberal and candid opinion and conduct with reſpect to all who differed from him. In his natural temper he was cheerful and lively; in his converſation agreeable, animated, and inſtructive; in his private character amiable and reſpectable; and in all the relations and intercourſes of domeſtic and ſocial life, eſteemed and honoured. In 1783, he married the daughter of Mr. Joſhua Hobſon, an eminent builder, of the denomination of quakers, by whom he left four children.

BLACKBURN, in *Geography*, a town of Lancaſhire, England, is ſeated in a valley ſurrounded with hills. It conſiſts of ſeveral ſtreets, irregularly laid out, but intermixed with good houſes. Beſides the pariſh church, here are a newly erected chapel of the eſtabliſhment, and five places of worſhip for as many different ſects of diſſenters. A free-ſchool was founded by queen Elizabeth, and the neceſſitous poor of the town are comfortably provided with a poor-houſe, which has land attached to it for the paſturage of cattle.

The market, on Mondays, is chiefly ſupplied with proviſions from Preſton. Beſides this, here are a fortnight market for cattle, &c. and an annual fair. The town is approached by four ſtone bridges croſſing the river Derwent, whoſe water, being of rather a blackiſh hue, is ſaid, by ſome writers, to have given name to the town. Blackburn has been noted for its manufactures, particularly for an article called *Blackburn-greys*, which were plains of linen-warp ſhot with cotton. The proſperity of Manchester, and the great influx of manufacturers to that town and its neighbourhood, have deprived Blackburn of its uſual trade; yet ſome cottons, calicoes, and muſlins are ſtill made here, and the fields around the town are frequently covered with materials to bleach.

The church of Blackburn, previous to the reformation, was attached to the abbey of Whalley. It is now a rectory, poſſeſſed by the archbiſhop of Canterbury, who alſo owns half of the town, which he lets on leaſes of 21 years. The pariſh of Blackburn includes 24 townſhips, and embraces about half the hundred of the ſame name. The land round the town is moſtly a ſandy ſoil, and conſequently unpropitious to agriculture. Coal is found in the ſouthern part of the pariſh, and in great plenty at Darwen, about four miles ſouth of the town. An alum mine was found, and much worked here, in the time of Fuller, but from the depth of the ſtrata, and conſequent expence, it was afterwards neglected. Sir George Colebrook, wiſhing to monopoliſe all the alum

alum of the country, purchaſed this, with other mines; but failing in his unjuſt ſpeculations, was obliged to relinquiſh the works at Blackburn. (See ALUM.) Blackburn contains 2352 houſes, 11,980 inhabitants, and is 211 miles N.W. from London. Aikin's deſcription of the country round Mancheſter, 4to. 1795.

BLACKBURN, the name of a river in Scotland celebrated for its romantic caſcades, for the bold and pictureſque ſcenery adorning its banks, and for a ſingular natural bridge which ſtretches acroſs the ſtream, in the pariſh of Caſtletown. The latter is deemed one of the greateſt curioſities in Scotland. "It is 55 feet long, 10 feet wide, and the thickneſs of the arch is two feet four inches of ſolid ſtone. It is not compoſed of one entire rock, but has the appearance of many ſtones of about one foot and a half ſquare, ſet neatly together. The bridge ſlopes a little downwards, and the water ruſhes under the arch, through an opening of 31 feet. Among the caſcades, which ornament and enliven this ſtream, is one of above 37 feet in height, and 20 feet in width; another 31 feet high, and 36 feet broad; and a third 27 feet in height. Theſe waterfalls, combining with the romantic character of the rocks, and the conſtant roar of the daſhing ſtream, preſent a great number of highly pictureſque and intereſting ſcenes. In this wild and romantic vale, nature appears in various forms, now beautiful, then awful, ſometimes ſublime, and frequently terrible." Sir John Sinclair's ſtatiſtical account of Scotland, vol. xvi. communicated by the Rev. Mr. Arkle.

BLACKBURNE, FRANCIS, in *Biography*, a clergyman of the church of England, diſtinguiſhed by his firm attachment to the cauſe of civil and religious liberty, and by his zealous exertions in the promotion of it, was born of reſpectable parents at Richmond, in Yorkſhire, on the 9th of June 1705. Having purſued a courſe of claſſical education, firſt at Kendal in Weſtmorland, and afterwards at the free ſchools of Hawkſhead in Lancaſhire, and of Sedbergh in Yorkſhire, he was admitted, in May 1722, penſioner of Catherine hall, in the univerſity of Cambridge; where he took the degree of bachelor of arts, and was choſen conduct or chaplain-fellow of the ſociety; and on this title he was ordained deacon in March 1728. At this time he flattered himſelf with the expectation of a foundation-fellowſhip; but his avowal of ſentiments with regard to eccleſiaſtical and civil liberty, which he had acquired by the peruſal of the writings of Locke, Hoadly, &c. rendered him obnoxious to a majority of the fellows, who, being high royaliſts on the principle of hereditary right, ſet aſide his juſt claims as the only qualified candidate, and precluded his election, by indulging Mr. Addenbroke with an extraordinary year of grace, and thus keeping the fellowſhip full. This diſappointment induced him to reſign his conductſhip, to quit the univerſity, and to live in retirement with his uncle, Thomas Comber, eſq. of Eaſt Newton, near Helmſley in Yorkſhire, till ſome church preferment might occur. His views, indeed, were particularly directed to the living of Richmond, the place of his nativity; to which he was inducted upon the death of the incumbent in 1739, having previouſly qualified himſelf for it by taking prieſt's orders. During the interval of his retirement at Eaſt Newton, he caſually found ſome old books that had formerly belonged to his great grandfather, an Oliverian juſtice; and by the peruſal of theſe he was led to entertain favourable ſentiments of the manners and principles of many excellent old puritans, to admire their unaffected and diſintereſted piety, and their zeal for the ſpiritual good of mankind, and to cheriſh that moderation and liberality of temper, and that ardent concern for liberty, which diſtinguiſhed his future conduct. As ſoon as he was inveſted with a parochial cure, he devoted himſelf with exemplary diligence to the ſtudies and duties appropriate to his paſtoral office, which he diſcharged, during a reſidence among his pariſhioners of 48 years, no leſs to their ſatisfaction and improvement than to his own honour. His firſt appearance as an author was in the year 1742, when he publiſhed an "Aſſize Sermon," preached at York. About the ſame time he wrote two pamphlets concerning the illegal removal of the conſiſtory court and its records from Richmond to Lancaſter, which, in conſequence of a petition from the mayor and corporation to the biſhop of Cheſter, were reſtored. In 1748, he employed a young perſon, who was his curate, to tranſlate Eraſmus's preface to his paraphraſe on the goſpel of St. Matthew; and having written "A Preliminary Diſcourſe addreſſed to the Roman Catholic gentry and laity of Great Britain," he circulated a cheap edition of it, recommending it to the public, partly as an antidote againſt popery, but chiefly as an encouragement to the common people to be diligent in reading the ſcriptures, for the information and improvement of themſelves and families in Chriſtian knowledge and Chriſtian piety. It was not, however, till the year 1750, that Mr. Blackburne began to diſtinguiſh himſelf as a writer in defence of Chriſtian liberty. A work had been publiſhed in the preceding year, intitled "Free and Candid Diſquiſitions relating to the Church of England." This work contained many pertinent obſervations on exiſting defects and improprieties in the eſtabliſhed forms of the church, and propoſals for reviſing the liturgy, and amending ſuch paſſages, as were liable to reaſonable objections. Mr. Blackburne was ſuſpected by many, who were acquainted with his ſentiments on the ſubject of an eccleſiaſtical reform, to have had a concern in this publication. But though he had correſponded with the compiler and editor of it, and had ſeen the greateſt part of the work in manuſcript, he had neither written nor ſuggeſted a ſingle line or word. Indeed, he diſapproved the ſtyle and ſpirit of it; and thought them by no means adapted to the occaſion, nor likely to produce effect. "He was rather, perhaps too much (ſays his biographer), inclined to look upon thoſe who had in their hands the means and the power of reforming the errors, defects, and abuſes in the government, forms of worſhip, faith and diſcipline of the eſtabliſhed church, as guilty of a criminal negligence, from which they ſhould have been rouſed by ſharp and ſpirited expoſtulations." Nevertheleſs, he thought it his duty to repel the attacks of the adverſaries of this work; and accordingly, he publiſhed, without the knowledge of its editor, or any of his more confidential aſſociates, an "Apology for the Authors of the Free and Candid Diſquiſitions," 1750. But though he engaged in this controverſy, his attention was not diverted from parochial duties; for his next publication was "A ſhort Diſcourſe on the Nature, Obligation, and Benefits of Family Religion," which he publiſhed at his own expence, and diſtributed among his pariſhioners. In this ſame year 1750, notwithſtanding the publication of his "Apology," he was collated to the archdeaconry of Cleveland, and alſo to the prebend of Bilton, by Dr. Matthew Hutton, then archbiſhop of York, to whom he had been for ſome years titular chaplain. Towards the cloſe of the year 1752, he had an opportunity of peruſing the charge delivered by Dr. Butler, biſhop of Durham, to the clergy of his dioceſe at his primary viſitation in 1751; and he found in it ſome doctrines which were, in his opinion, ſo diametrically oppoſite to the principles on which the proteſtant reformation was founded and ſupported, as to deſerve being expoſed and cenſured, in order to prevent the miſchief which they might do under the ſanction of his name. Accordingly, he wrote ſtrictures upon them; and, in oppoſition

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to the remonſtrances of a friend who diſſuaded him from publiſhing them, leſt they might be the means of preventing his further preferment, he committed them to the preſs under the title of "A ſerious Enquiry into the Uſe and Importance of external Religion, &c." This piece, which was afterwards printed by Mr. Baron, in the 4th volume of a collection of tracts, entitled, "The Pillars of Prieſtcraft, and Orthodoxy ſhaken," and aſcribed to him as its author, gave great offence, particularly to archbiſhop Secker, and precluded all hopes of preferment in the church, if indeed he had indulged any ſuch hopes, under epiſcopal patronage. The next ſubject of importance, which engaged his attention, was the doctrine of an intermediate ſtate. To this he was led by an "Appendix" to Dr. Law's "Conſiderations on the Theory of Religion," which appeared in 1755, and which inculcated the tenet of the ſleep of the ſoul. This opinion was attacked from ſeveral quarters, and particularly by Dr. Goddard, maſter of Clare-hall, in a ſermon preached at St. Edmund's Bury. Mr. Blackburne defended his friend Dr. Law, in a publication entitled "No Proof in the Scriptures of an intermediate ſtate of happineſs or miſery, between death and the reſurrection." He alſo publiſhed ſeveral other pieces on the ſame topic; ſuch as "Remarks on Dr. Warburton's account of the ſentiments of the early Jews concerning the ſoul;" and "A Review of ſome paſſages in the laſt edition of the Divine Legation of Moſes demonſtrated," which appeared in 1759, and may be conſidered as a ſequel to the "Remarks." He alſo prepared a reply to Dr. Morton, Mr. John Steffe, and Dr. Caleb Fleming, who had publiſhed ſtrictures on Dr. Law's Appendix; and he purſued the diſcuſſion of the ſubject more at large in a work, firſt publiſhed in 1765, and afterwards with conſiderable additions in 1772, and entitled "A ſhort hiſtorical View of the Controverſy concerning the intermediate ſtate between death and the reſurrection, with a prefatory diſcourſe on the uſe and importance of theological controverſy." In 1756, our author publiſhed "Some Sentiments of a country divine concerning the Ordinance of Baptiſm, &c." occaſioned by letters which paſſed between biſhop Clayton and Mr. Penn on that inſtitution. In the correſpondence between theſe writers, a difficulty occurs in the interpretation of the charge given by our Lord to his apoſtles. Matt. xxviii. 19. Our Lord, it is ſaid, preſcribes *one* preciſe form of words to be uſed in baptiſm; the apoſtles appear, from the Acts and Epiſtles, to have uſed *another;* and the evangeliſts Mark, Luke, and John, do not mention *any preciſe* form whatever. Various hypotheſes have been propoſed by Grotius, Limborch, Lightfoot, Whitby, Clayton, &c. for reconciling the practice of the apoſtles with the precept of Chriſt. Mr. Blackburne, diſſatisfied with all theſe, ſuggeſts that the words in queſtion contain no baptiſmal form at all; and that we ſhould rather follow the apoſtolical form in Acts, as being derived to us by the authority and example of men, who muſt be perfectly ſatisfied that the foundation they built upon was ſound and good. Accordingly, he propoſes that we ſhould read the paſſage in St. Matthew thus; Πορευθεντες οὖν μαθητευσατε παντα τα εθνη (βαπτιζοντες αυτους) εις το ονομα τε πατρος, και τε υιε, και τε πνευματος αγιε; "Go ye therefore, and diſciple all nations (baptizing them) into the name of the Father, and of the Son, and of the Holy Ghoſt." By conſtruction and parentheſis, the command to baptize refers to no particular form at all, and leaves us to ſuppoſe, what was certainly the truth of the matter, that the apoſtles being already well acquainted with the form uſed in the baptiſm of Jeſus, it was quite ſuperfluous to enjoin it here.

In 1758, Mr. Blackburne avowed the ſentiments which he had for ſome time entertained concerning ſubſcription to the liturgy and articles of the church of England, in "Remarks on the Rev. Dr. Powell's ſermon in defence of ſubſcriptions, &c." preached in the preceding year before the univerſity of Cambridge, to which is prefixed "An Addreſs to the younger ſtudents in both our univerſities." The ſubject of ſubſcription had indeed for ſome time engaged his attention; and it was not without ſcruples that he had qualified himſelf to hold the archdeaconry and prebend in 1750; but when he had reaſon to expect further advancement in the church, he reſumed the conſideration of the ſubject, and the reſult was a determination never to renew his ſubſcription. About this time he began to make collections for his famous work entitled "The Confeſſional, or a full and free Enquiry into the right, utility, and ſucceſs of eſtabliſhing Confeſſions of faith and doctrine in Proteſtant churches." This work, in the execution of which he was much encouraged by Dr. Edmund Law, afterwards biſhop of Carliſle, lay by him in manuſcript for ſeveral years, and was at length publiſhed in 1766, 8vo. without his name. It excited, as we may naturally imagine, very general attention both among the partizans of reform and the advocates for exiſting eſtabliſhments. A ſecond edition appeared in 1767; and the controverſy, which it occaſioned, laſted for ſome years, and produced a great number of publications. The third edition, corrected and much enlarged, was publiſhed in 1770; and to this edition has been added from the author's manuſcript, in the late collection of his works, an appendix, containing a ſhort hiſtory of the confeſſions eſtabliſhed in the church of Scotland at different periods. For a further account of the ſubject of this work, and of the arguments for and againſt ſubſcription, ſee SUBSCRIPTION. Soon after the publication of the third edition of the "Confeſſional," the author was induced by ſeveral of his friends to draw up and publiſh "Propoſals for an application to parliament for relief in the matter of ſubſcription to the liturgy and thirty-nine articles of the eſtabliſhed church of England, humbly ſubmitted to the conſideration of the learned and conſcientious clergy of the ſaid church." An aſſociation was formed for this purpoſe, for the reſult of which, ſee ASSOCIATION.

It was natural to imagine, that the author of ſuch a work as the "Confeſſional," written with a view of examining and refuting the ſeveral pleas that had been urged in favour of ſubſcription, and which had convinced many perſons of the inſufficiency of theſe pleas, would have wiſhed to withdraw himſelf from the eſtabliſhed church, which impoſed a ſubſcription that appeared to him to be unjuſtifiable; and accordingly, as the death of Dr. Chandler, in 1766, occaſioned a vacancy in the reſpectable congregation of diſſenters at the Old Jewry, in London, ſome individuals of that ſociety applied to Mr. Blackburne for information, whether ſuch a ſituation would be agreeable to his views, if it were offered to him. But, with the proſpect of a very conſiderable acceſſion to his income, he declined accepting the propoſal, for reaſons that were very ſatisfactory to thoſe who made it. The clear amount of all that he poſſeſſed, as a beneficed clergyman, never much exceeded the ſum of 150l. a year; whereas, if the removal that had been ſuggeſted to him had taken place, his income would have been nearly trebled. Some other circumſtances alſo afterwards occurred, which had a tendency to detach him from the eſtabliſhed church. Two very reſpectable clergymen, immediately connected with his own family, viz. the learned Mr. Theophilus Lindſey, whoſe excellent character thoſe who are moſt adverſe to his theological opinions concur in applauding, and his ſon-in-law, Dr. Diſney, no leſs eſteemed by all who know him, ſurrendered their preferments, becauſe they diſapproved the doctrines and forms of the eſtabliſhed church.

Mr. Blackburne, however, though he agreed with his valued relatives in many of their objections to the liturgy and articles of the church, differed from them with regard to several doctrinal points of importance; and without seeming to advert to his past subscription; in consequence of which he still held his church preferments, he satisfied himself with refusing any further preferment, which was actually offered to him, because he was determined not to renew his subscription. His continuance in the church cannot be justly ascribed to any selfish and interested motives, because he might have left it with advantage, and he remained in it with a fixed purpose of accepting no preferment; and he refused very considerable offers of this kind. But, in order to vindicate his consistency, he thought it right to avow his motives for continuing minister in the church, while he disapproved many things in her doctrine and discipline; and with this view he drew up a short paper containing "An Answer to the question, Why are you not a Socinian?" and also his reasons for officiating in a church, whose forms of faith, worship, and discipline, he thought to be in many things highly exceptionable. Those who wish for satisfaction on these points, are referred to the Appendix annexed to the Memoirs of his Life, p. 120. We shall content ourselves with observing, that Mr. Blackburne was a firm believer of the pre-existence of Christ, and that he also maintained his divinity, with limitations according to his own ideas, which he believed to be founded on the Scriptures; and with regard to the general sentiments of his creed, he is said to have more than once declared himself a moderate Calvinist. Whatever may be the inconsistency which some persons have charged upon his conduct, he manifested his esteem for the church, not only by continuing his own connection with it, but by educating a son for the clerical office, though the condition of performing any duties, or enjoying any emoluments in that church, was subscription, the imposition of which he had strongly reprobated and condemned. On this subject, the further discussion of which would lead us beyond our province as biographers, we shall only say, "Let every man be fully persuaded in his own mind; to his own master he standeth or falleth." See SUBSCRIPTION.

Having been accustomed from early life to regard the Roman Catholics as dangerous foes to the government and religion of his country, Mr. Blackburne, notwithstanding the enlarged and liberal sentiments avowed by him on all other occasions, wrote against them with a severity which the friends of freedom have generally condemned. But an alarm with regard to the spread of popery, and the evils to be apprehended from it, prevailed very much at the time; and this induced him, in 1768, to publish a caution against it, under the title of "Considerations on the present state of the controversy between the Protestants and Papists of Great Britain and Ireland, particularly on the question, how far the latter are entitled to toleration upon Protestant principles."

During the intervals of his other professional and literary engagements, he employed himself in collecting materials for the life of Martin Luther, which he proposed to write according to the pattern of Dr. Jortin's life of Erasmus; but he was diverted from accomplishing his design, first by the death of his friend Thomas Hollis, esq. of whom he published "Memoirs," in 2 volumes 4to. in 1780, and afterwards by the loss of his second son Thomas, in 1782, a physician of rising eminence in the city of Durham, which so affected him as to render him incapable of finishing several things which he had undertaken. Soon after his eye-sight failed him, and he was under the necessity of employing an amanuensis. His mind, however, was still enterprising and active; nor was he prevented by the increasing infirmities of age from prosecuting the object of ecclesiastical reformation, which seems to have occupied his thoughts to the latest period of his life, and from performing his professional duties. Having in the last year of his life prepared a charge for his 38th annual visitation in Cleveland, he caused it to be delivered by his eldest son, who stood by him, and then took leave of his clerical brethren, with an address equally pious and affectionate, that must have deeply impressed the minds of all who heard it. At the close of his visitation circuit, he was taken ill at the house of a friend, and apprehensive of approaching dissolution, hastened to his rectory at Richmond with all the expedition which the state of his health allowed. Within a few weeks after his return, on the morning of August 7th 1787, in his 83d year, he finished the protracted course of a studious and exemplary life, with the sentiment of the amiable Erasmus, and the benevolent Jortin, "I have had enough of every thing in this world." and expired, as he sat in his chair, without a groan. He left a widow, who died August 20th 1799, and four children; *viz.* Jane, married to the Rev. Dr. Disney, now minister of the Unitarian society in Essex-street, London: the Rev. Francis Blackburne, vicar of Brignal, near Greta-bridge, Yorkshire; Sarah, married to the Rev. John Hall, vicar of Chew Magna, and rector of Dundry in Somersetshire; and William Blackburne, M.D. of Cavendish-square, London.

Few persons have ever been more regular and assiduous in the performance of professional duties, whether we consider him as a parish priest, or as an archdeacon, than Mr. Blackburne. Possessing naturally a strong constitution of body, and great firmness of mind, which he preserved by temperance to a very advanced period, he was capable of intense and continued application. He was likewise animated in the discharge of his clerical functions by a conviction of their importance, and by an ardent desire of promoting the best interests of those with whom he was connected. In composing for many years new discourses, whenever he officiated, and also charges for his archidiaconal visitations, and in preparing for the press a variety of publications, a great part of his time must have been spent in study and retirement; and hence he is said to have acquired the appearance of austerity; nevertheless with his intimate friends and associates he was cheerful and unreserved. As a writer he was nervous and animated; and his public discourses were delivered with an unaffected earnestness, which proceeded from conviction of the importance of religious truth and duty, and which interested and impressed those who heard him. In his controversial writings, it must be acknowledged, and he himself lamented it towards the close of his life, that he was occasionally betrayed into precipitance of judgment and asperity of language: but it should be recollected, that he contended with a host of adversaries, whose mode of attack sometimes provoked and justified his resentment; and that his vehemence and ardour were always accompanied with a high sense of integrity and honour, and a laudable solicitude for serving what he conceived to be the cause of truth and liberty. The topics of his numerous publications, the principal of which we have above recited, were chiefly theological or controversial; nevertheless he was an occasional writer on political liberty, and he largely contributed to a collection of letters and essays on this subject, published in 3 vols. 8vo. 1774. A collection of his "Works, theological and miscellaneous, including some pieces not before printed, with some account of the life and writings of the author, by himself, completed by his son Francis Blackburne, L.L.B. and illustrated by an appendix of original papers," has this year (1804) been published in 7 vols. 8vo. The following re-

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ſpectful and juſt tribute to his memory cloſes his ſon's account of his life and writings: "Such was Francis Blackburne; a believer of Chriſtianity, from the deepeſt conviction of its truth; a Proteſtant on the genuine principles of the reformation from popery; a ſtrenuous adverſary of ſuperſtition and intolerance, and of every corruption of the ſimplicity or the ſpirit of the goſpel; a zealous promoter of civil liberty; a cloſe and perſpicacious reaſoner; a keen and energetic writer; an attentive, benevolent, and venerable archdeacon; an eloquent and perſuaſive preacher; a faithful paſtor and exemplary guide; of unblemiſhed purity of life, of ſimple dignity of manners; a ſincere and cordial friend; an affectionate huſband, and an indulgent father; in ſhort, a juſt, humane, pious, temperate, and independent man."

BLACKBURNIA, ſo named by Forſter, in honour of John Blackburne, eſq. and his daughter Anne, of Orford in Lancaſhire, in *Botany*. Lin. gen. Schreb. n. 199. Forſter gen. 6. Claſs and order, *Tetrandria Monogynia*. Gen. Char. *Cal.* perianth very ſhort, four-toothed, inferior; teeth ſhort, acute, horizontal. *Cor.* petals four, elliptic. *Stam.* filaments four, ſubulate, rather ſhorter than the petals; anthers heart-ſhaped, erect. *Piſt.* germ conic; ſtyle ſiliform, erect, length of the ſtamens; ſtigma ſimple. *Per.* berry. *Seed* ſingle.

Eſſ. Char. *Cal.* four-toothed; *pet.* four, elliptic; *anth.* heart-ſhaped; *germ* conic; *ſtigma* ſimple. *Per.* berry, with a ſingle ſeed.

Species 1. B. *pinnata*. Forſt. gen. 6. t. 6. fl. Auſtr. n. 53. Ptelea pinnata. Linn. ſuppl. 126. A native of Norfolk iſland; found there in 1774. Martyn.

BLACKBURNIÆ, in *Ornithology*, a ſpecies of MOTACILLA, deſcribed in the Arctic Zoology under the name of the blackburnian warbler. The crown is black, with a yellow line in the middle; band through or acroſs the eye black, as are alſo the leſſer wing coverts; greater wing-coverts, vent, and lateral tail-feathers white, the middle ones being duſky black; ſides of the neck, chin, and middle of the belly yellow. A native of New York.

BLACKHEAD, in *Geography*, a cape on the eaſt coaſt of Ireland, at the north entrance into Belfaſt Lough. N. lat. 54° [illegible]'. W. long. 5° [illegible]'.

BLACKHEAD, a cape on the weſtern coaſt of Ireland, in the county of Clare, on the ſouth ſide of the entrance into Galway bay. N. lat. 53° 7'. W. long. 9° 11'.

BLACKHEAD, a cape on the ſouth coaſt of Ireland, within the old head of Kinſale, and on the weſt ſide of Kinſale harbour. N. lat. 51° 38'. W. long. 8° 30'.

BLACKHEAD, a cape on the weſt coaſt of Scotland, in the county of Wigton; 6 miles W.S.W. of Stranraer.

BLACKHEAD, a point of land between Falmouth haven and the Lizard point.—Alſo, one of the peaks between Fermowe's harbour on the eaſt coaſt of Newfoundland, and Agua fort; Bald head being the other.—Alſo, a point on the ſouth coaſt of Newfoundland, weſt of cape Race, and half a league further weſt from cape Pine.—Alſo, a point on the eaſt coaſt of the northern iſland of New Zealand, N.N.E. of cape Turnagain, in about 40° 18' S. lat.

BLACKING, in the *Arts*, &c. is ſometimes uſed for a factitious black, as lamp-black, ſhoe-black, &c. A mixture of ivory or lamp-black with linſeed oil, makes the common oil-blacking. For a ſhining blacking, ſmall beer or water is uſed inſtead of oil, in the proportion of about a pint to an ounce of the ivory black, with the addition of half an ounce of brown ſugar, and as much gum Arabic. The white of an egg, ſubſtituted for the gum, makes the black more ſhining; but is ſuppoſed to hurt the leather, and make it apt to crack.

In 1771 a patent was granted to Mr. William Bayley for preparing a compoſition in cakes, rolls, or balls, which, with the addition of water only, makes an excellent ſhining liquid blacking for ſhoes, boots, &c. The recipe for this purpoſe is as follows: Take one part of the gummy juice that iſſues, in the months of June, July, and Auguſt, from the ſhrub called the goat's thorn, four parts of river water, two parts of neat's foot, or ſome other ſoftening lubricating oil, two parts of ſuperfine ivory-black, two parts of deep blue, prepared from iron and copper, and four parts of brown ſugar-candy. Evaporate the water; and, when the compoſition is of a proper conſiſtence, let it be formed into cakes of ſuch a ſize, that each cake may make a pint of liquid blacking.

BLACKLOCK, THOMAS, in *Biography*, was born in 1721, at Annan in Scotland, of parents, who were natives of Cumberland, and who occupied a humble ſtation. At the age of 6 months he was deprived of his ſight by the ſmall-pox; and thus becoming incapable of any mechanical employment, he was in the probable courſe of nature deſtined to be a perpetual charge to his parents. His diſpoſition, however, as he advanced towards maturity, engaged the moſt affectionate attention; and the kindneſs of his father was ſuch as to impreſs his youthful mind, and to engage expreſſions of ardent gratitude. The powers of his mind were no leſs diſtinguiſhed than the amiableneſs of his temper; and he improved the caſual opportunities of cultivating them, which were afforded him by the attention of his father and friends, who read to him ſeveral paſſages out of Engliſh authors, and particularly from the works of our moſt approved and popular poets. Theſe he heard with avidity and delight; and at the early period of his 12th year, he began to imitate what he admired. His performances, as he advanced towards maturity, became the ſubjects of general converſation; and having the misfortune to loſe his father in his 19th year, he was invited, at the age of 20, by Dr. Stephenſon, phyſician at Edinburgh, to remove thither and to purſue his ſtudies at the univerſity. Notwithſtanding the perſonal diſadvantages under which he laboured, he made very conſiderable progreſs in the Latin, Greek, and French languages; but upon the breaking out of the rebellion in 1745, his ſtudies were interrupted, and he retired into the country. On this occaſion he was ſolicited by his friends to publiſh a ſmall collection of his poems at Glaſgow. When the tumult of the rebellion ſubſided, he returned to Edinburgh, and to the proſecution of his ſtudies for 6 years more, during which period he not only perfected himſelf in the languages, but made conſiderable progreſs in all the ſciences, and particularly in polite literature. In 1754, he publiſhed a ſecond edition of his poems, much improved and enlarged; and thus gained the patronage of Mr. Spence, who, by an account of his life, character, and poems, brought him into general notice. By means of a ſubſcription to a 4to. edition of his poems, his circumſtances were rendered eaſy and comfortable; and applying himſelf to the ſtudy of theology, he paſſed the uſual trials, and was licenſed in 1759 to be a preacher by the preſbytery of Dumfries. From the diſcharge of the duties of his office he derived great ſatisfaction and reputation. On the alarm of a French invaſion in 1761, he publiſhed a diſcourſe "On the right improvement of time;" and in the ſame year he contributed ſome poems to the firſt volume of Donaldſon's collection of original poems. In 1762 he formed a matrimonial connection, which he regarded as the chief ſource of the felicity of his future life. About this time he was ordained miniſter of Kircudbright, on the preſentation of the earl of Selkirk; but in conſequence of ſome litigations that enſued, he

thought it moſt expedient, within two years, to reſign this preferment, and to retire upon a moderate annuity. With this ſlender proviſion he removed in 1764 to Edinburgh, and opened his houſe for the accommodation of young perſons as boarders and ſtudents. In 1766 the mariſchal college of Aberdeen conferred upon him the degree of doctor in divinity. From this time he continued to maintain his literary character by ſeveral publications, which it will be ſufficient to enumerate. Theſe were, "Paracleſis, or Conſolations deduced from natural and revealed religion," in two diſſertations, 8vo. 1767; "Two Diſcourſes on the evidences and ſpirit of Chriſtianity, tranſlated from the French of Mr. James Armand," 8vo. 1768; "A Panegyric on Great Britain," a ſatyrical piece, 8vo. 1773; "The Graham, an heroic ballad, in four cantos," 4to. 1774; "Remarks on the nature and extent of liberty, &c. and on the juſtice and policy of the American war, occaſioned by peruſing the obſervations of Dr. Price on theſe ſubjects," 8vo. 1776; and a valuable article, communicated to the editors of the Encyclopædia Britannica, "On the education of the blind," 1783. A 4to. edition of Dr. Blacklock's poems was printed in 1793. This edition contains an eſſay on the education of the blind, being a tranſlation of M. Haüy's celebrated eſſay on this ſubject; and prefixed to it we have a new account of the life and writings of the author by Mr. Mackenzie, author of the Man of Feeling, &c. Dr. Blacklock died at the age of 70, in July, 1791. With reſpect to his talents, Mr. Hume obſerves, "that he may be regarded as a prodigy;" and to his moral character he bears this honourable teſtimony, that "his modeſty was equal to the goodneſs of his diſpoſition, and the beauty of his genius." In the depreſſed circumſtances of his early life he was ſingularly contented and acquieſcing; but his loſs of ſight deeply affected his ſenſibility, and he deplores it in plaintive accents in one of his poems, written on occaſion of his eſcape from falling into a deep well. At the ſame time he was diſtreſſed by apprehenſions of ſinking into extreme indigence; however he expreſſes his truſt in Providence, and his hope that the clouds which were gathering over him would be diſſipated. Next to his religious principles, were letters, converſation, and muſic, from which he derived his principal ſolace. His poetry is eaſy, elegant, and harmonious; and abounds with images, deduced from viſible objects, and aptly applied. He is ſaid to have compoſed with rapidity, and hence it is owing that his vivacity and animation are often indulged at the expence of correctneſs and regularity. In ſentiment he diſplays much benevolence and tenderneſs of diſpoſition, as well as true piety and philoſophy. Spence, *ubi ſupra*. Gen. Biog

BLACKMORE, Sir Richard, M. D. an indefatigable writer, poet, and phyſician, was born at Corſham in Wiltſhire, about the year 1650. After ſome years ſpent at a grammar ſchool in the country, he was ſent to Weſtminſter ſchool, and in 1668 to Edmund-hall, Oxford. In 1676 he took his degree of maſter of arts, and continued to reſide at college three years after, but apparently without receiving much benefit from his long reſidence in this ſeat of the muſes, ſcarcely knowing the names or ſituations of places, which an intimacy with claſſical authors muſt have made familiar to him. At ſome time in his life, probably immediately on quitting college, he kept a ſchool, but does not ſeem to have remained long in that ſtation, as he ſoon after went to Paris, and to other places on the continent, with a view, it is probable, of acquiring or improving his knowledge in medicine, in which faculty he took his degree of doctor at Padua. Returning to England, after a ramble of eighteen months, he came to London, and ſettled at firſt in Cheapſide, where he acquired ſo much reputation, that in 1687, he was admitted a fellow of the college of phyſicians. In 1697, he received the honour of knighthood from king William, accompanied with a preſent of a gold chain and medal, which, he intimates, were given him as a reward for ſome ſervices performed at the revolution. The ſame year he was made phyſician in ordinary to the king; an office he held afterwards under his ſucceſſor, queen Anne. He was now in the zenith of his reputation, and having as yet but little expoſed himſelf to the ſcrutiny of the critics by writing, his merit was probably rated much beyond its real ſtandard. To his popularity as a phyſician, and his excellent and unimpeached moral character, it was probably owing that his firſt production, "Prince Arthur," an epic poem, in ten books, publiſhed a little before this time, acquired ſo much celebrity as to paſs through three editions in the ſpace of two years. Encouraged by this ſucceſs, in 1699 he publiſhed his "King Arthur," in twelve books, with paraphraſes on the book of Job, and on other parts of ſcripture; and in 1700, his "Satire on Wit," in which he took occaſion to retort the ſarcaſms which had been heaped with no ſparing hand on his laſt poems by Dennis, Dryden, Pope, and moſt of the wits of the time. Not deterred by their cenſures, in 1705 he publiſhed "Eliza," another heroic poem, in ten books. "This excited," Johnſon ſays, "neither praiſe nor blame, but ſeems to have dropped dead born from the preſs." In 1712, appeared "Creation," a philoſophical poem, certainly the beſt of his productions. It had the honour of being praiſed by Addiſon, in the Spectator, and Dr. Johnſon has ſince inſerted it in his collection of Engliſh poets, with commendation much beyond its merit. This for a time revived its credit, and gave it a degree of celebrity, which ſeems again to be declining apace. Pleaſed with the reputation procured by this poem, he ſoon after produced his fourth and laſt epic poem in twelve books, intended to commemorate the actions of king Alfred, whoſe name it bore, but like Eliza, it excited little notice; benevolence being aſhamed any longer to patronize, and malevolence weary of inſulting, ſuch frigid abortions. But as if it was to be the fate of this author to try every ſpecies of writing, and to fail in all, on the Spectator ceaſing, he produced, in conjunction with Mr. Hughes, the "Lay Monaſtery;" one paper of which was publiſhed three times in the week. This was only continued to the 40th number. Soon after he gave the world two volumes of eſſays. As theſe were intended to promote the cauſe of virtue and religion, they met with ſome favour. Beſides theſe works, Dr. Blackmore wrote ſeveral tracts on different branches of medicine; on the ſpleen, the gout, the rheumatiſm, the king's evil, the dropſy, the jaundice, the diabetes, the plague; and as inoculation for the ſmall-pox was making ſome progreſs in his time, he thought it incumbent on him to give his decided diſapprobation of the practice. But as by this time he began to be eſteemed ſcarcely a better phyſician than a poet, his opinion had fortunately very little weight with the public. The medical tracts are publiſhed together in an 8vo. volume, but are little known or noticed. He died on the 8th of October, 1729. Gen. Biog. Johnſon's Lives of the Poets.

BLACKNESS, the quality of a black body; or a colour ariſing from a texture and ſituation of the ſuperficial parts of the body, which, as it were, ſtifle, or rather abſorb, the light falling on it, without reflecting any, or very little of it, to the eye. In which ſenſe, blackneſs ſtands directly oppoſed to whiteneſs; which conſiſts in ſuch a texture of parts, as indifferently reflects all the rays thrown upon it, of whatſoever colour they be.

Deſcartes, ſays Dr. Prieſtley (Hiſt. of Viſion, p. 127 and 143, &c.), though miſtaken with reſpect to the nature of light and colours, yet diſtinguiſhes juſtly between black and white, obſerving, that black ſuffocates and extinguiſhes the

rays

rays that fall upon it; but that white reflects them. This, adds the hiſtorian of philoſophy, is the firſt diſtinct account I have met with of this ſenſible hypotheſis. Mr. Boyle alſo made ſeveral obſervations and experiments, which demonſtrate his theory in a very ſatisfactory manner. See Black.

Sir Iſaac Newton, in his Optics, ſhews, that for the production of black colours, the corpuſcles muſt be leſs than thoſe which exhibit any other colours; becauſe, where the ſizes of the component particles are greater, there is too much light reflected to conſtitute this colour: but, if they be a little leſs than is requiſite to reflect the white and very faint blue of the firſt order, they will reflect ſo little light, as to appear intenſely black; and yet may, perhaps, reflect it variouſly to and fro within them ſo long, till it happen to be ſtifled and loſt; by which means they will appear black in all poſitions of the eye, without any tranſparency.

And hence it appears, why fire and putrefaction, by dividing the particles of ſubſtances, turn them black: why ſmall quantities of black ſubſtances impart their colours very freely, and intenſely, to other ſubſtances, to which they are applied; the minute particles of theſe, by reaſon of their very great number, eaſily overſpreading the groſs particles of others. Hence alſo appears, why glaſs, ground very elaborately with ſand, on a copper plate, till it be well poliſhed, makes the ſand, together with what by rubbing is worn off from the glaſs and copper, become very black; and why black ſubſtances do, ſooneſt of all others, become hot in the ſun's light, and burn (which effect may proceed partly from the multitude of refractions in a little room, and partly from the eaſy commotion of ſuch very ſmall particles): alſo, why blacks are uſually a little inclined towards a blueiſh colour; for that they are ſo may be ſeen by illuminating white paper with light reflected from black ſubſtances, where the paper will uſually appear of a blueiſh white; and the reaſon is, that black borders on the obſcure blue of the firſt order of colours; and therefore reflects more rays of that colour than any other.

BLACKRIE, Alexander, in *Biography*, apothecary, a native of Scotland, publiſhed in 1766 a diſquiſition on medicines that diſſolve the ſtone, in which Dr. Chittick's ſecret is laid open, 12mo. It was reprinted in 1771, with additions. He found the ſolvent to be the lixivium ſaponarium, which may be given, he ſays, advantageouſly, mixed with lime water, even when blood is voided with the urine. When the bladder becomes ulcerated, wounded by the aſperities of the ſtone, he recommends the pareira brava and uva urſi. When pain in the loins or pubes is violent, he gives opium; and he has known, he ſays, perſons void ſtones in their ſleep, while taking that drug. Perſons who void red ſand or gravel with their urine, are never affected, he ſays, with the ſtone. Haller. Bib. Chirurg.

BLACKS, *Negroes*: a people ſo called from the colour of their ſkin. For the reaſon of their colour, and the commerce of them, ſee Negro.

Blacks, is alſo a name given to an aſſociation of diſorderly and ill-deſigning perſons, formerly herding chiefly about Waltham, in Eſſex, who deſtroyed deer, robbed fiſh-ponds, ruined timber, &c. See Black *act*.

BLACKSOD Bay, in ſome old maps erroneouſly called *Black harbour*, in *Geography*, a large bay lying between the peninſula of the Mullet, and the main land of the county of Mayo, Ireland, to the ſouth of the iſthmus. It is well ſheltered, the ground in moſt parts clean, and ſufficiently deep for large ſhips; but the ground being a hard ſand, it is not thought that it will hold well in hard gales from the weſt and ſouth-weſt, eſpecially in the winter time. It is 2½ miles wide at its entrance, and runs about 9 miles inland, with ſeveral creeks communicating with it, of which thoſe within Barnach iſle, and the point of Claggan, are the moſt remarkable. The ſouth-weſt point of this bay is in N. lat. 54° 6′. W. long. 9° 52′. M'Kenzie, &c.

Blacksod *Point*, the ſouthern point of the Muller, a peninſula in the weſtern part of the county of Mayo, Ireland, which forms the weſtern extremity of Blackſod bay. N. lat. 54° 6′. W. long. 9° 52′.

BLACKSTONE, J. in *Biography*, apothecary, of whom nothing is known, but that he publiſhed, in 1737, "Faſciculus Plantarum, circa Harefield, ſponté naſcentium, cum Appendice ad loci naturam ſpectante," 8vo. London. Among many common, ſome very rare plants were diſcovered by the author, and are deſcribed in this volume. He alſo publiſhed, in 1746, "Specimen botanicum, quo plantarum plurium Angliæ indigenarum, loci naturales illuſtrantur." 8vo. London, an intereſting and uſeful work. Haller. Bib. Botan.

Blackstone, William, Sir, knight and L.L.D. a celebrated Engliſh lawyer, was born in London, July 10th 1723, and received the firſt rudiments of learning at the Charter-houſe, where he was admitted upon the foundation in 1735, and whence he was removed, in 1738, to Pembroke college, Oxford. At ſchool and in the univerſity he was diſtinguiſhed by his application and proficiency; and the range of his ſtudies, even at an early period, was ſo extenſive, that he is ſaid to have compoſed a treatiſe on the "Elements of Architecture," for his own uſe at the age of 20. This treatiſe was never publiſhed. As he made choice of the profeſſion of the law, he was entered of the Middle Temple, and quitted Oxford in 1744 to purſue ſtudies, very different from thoſe to which his taſte inclined him at the univerſity. This change of his purſuits is feelingly commemorated in the "Lawyer's Farewel to the Muſe," compoſed about this time, and publiſhed in the fourth volume of Dodſley's Miſcellanies. From this period he aſſiduouſly applied to his profeſſional ſtudies, reſiding occaſionally in chambers in the Temple, for the convenience of attending the courts, and at other times in the univerſity, to which he was much attached. In 1743 he was elected a fellow of All-Souls college, and on the 24th of November 1746 he was called to the bar, and commenced the practice of the law. Deſtitute of a ready elocution, and of other talents requiſite for a popular advocate, his progreſs was ſlow; and he had leiſure to diſcharge the duties of burſar, or ſteward, of All-Souls, which he did with ſuch ſkill and diligence, as to improve the revenues of the college, and to aid in completing the magnificent ſtructure of the Codrington library. A treatiſe which he compoſed on this occaſion is ſtill uſeful in conducting the pecuniary concerns of this ſociety. In 1749, he was appointed recorder of Wallingford in Berkſhire; and deſirous of more conſtant reſidence at Oxford, he took in the following year the degree of doctor of laws. About this time he publiſhed an "Eſſay on collateral conſanguinity;" particularly referring to the claim made by the kindred of the founder of All-Souls to a preference in being elected fellows of that ſociety. It was written in defence of the college, which had lately rejected ſome of theſe claims; but the reaſoning, though ſupported by great learning and ingenuity, is deemed by ſome competent judges inconcluſive. In 1753, Mr. Blackſtone, perceiving, after a trial of ſeven years, that he had no proſpect of ſucceſs in the courts at Weſtminſter, determined to quit London, and to retire to his fellowſhip at Oxford. This reſolution was eventually very favourable both to himſelf and the public. As no public proviſion had been made either by the founders of the Engliſh univerſities, or at any ſubſequent

period, for teaching ſtudents the laws and conſtitution of their own country, Mr. Blackſtone undertook to ſupply this defect, and opened a courſe of public lectures upon this intereſting ſubject. With ſuch reputation and ſucceſs did he proſecute his plan, from Michaelmas term 1753, when his firſt courſe of lectures commenced, during a ſeries of ſucceſſive years, as probably to ſuggeſt the idea to Mr. Viner of founding by his will a very liberal eſtabliſhment in the univerſity of Oxford for the ſtudy of the common law. As ſoon as the plan of Mr. Viner's inſtitution could be arranged, Mr. Blackſtone was very properly elected, in October, 1758, the firſt Vinerian profeſſor; and he introduced the duties of his new office by a well-written lecture, adapted both to the ſubject and the audience, which was ſoon afterwards publiſhed, and which has been ſince prefixed to the firſt volume of his Commentaries.

With his engagements as a lecturer, Mr. Blackſtone combined the occaſional exerciſe of his profeſſion as a provincial barriſter; and, in 1754, he was employed as counſel in the great conteſted election for the county of Oxford. The ſubſtance of his pleadings on this occaſion was publiſhed in a pamphlet entitled "Conſiderations on Copyholders;" with a view to the legiſlative deciſion of the point controverted at this election. The argument of this treatiſe is founded on feudal principles, and excludes copyholders from the right of voting; this right being, by his reaſoning, reſtricted to thoſe who have a freehold or permanent intereſt in land, which does not belong to copyholders, whom the feudal ſyſtem conſiders as mere vaſſals, and dependent on the will of the lord. But it has been more liberally argued by others, that a ſeries of legal deciſions has given to this tenure all the permanence of freehold property, and that as the reaſon of the diſtinction between the two ſpecies of tenure has ceaſed, the diſtinction itſelf ought no longer to exiſt. However, in the parliamentary diſcuſſion of this queſtion, the technical arguments prevailed; and a declaratory act was ſoon afterwards paſſed, in conformity to the principles advanced by the profeſſor's treatiſe, excluding copyholders from the right of ſuffrage. In 1759, Blackſtone publiſhed, beſides two tracts of a local and temporary nature, a new edition of the "Great Charter, and Charter of the Foreſt," introduced by an hiſtorical preface, which evinced a conſiderable knowledge of antiquities. In the ſame year, the reputation gained by his lectures encouraged him to return to the Temple, and to reſume his attendance at Weſtminſter; where he ſoon acquired profeſſional eminence, and where he was employed for a conſiderable time in almoſt all caſes that required great learning and deep reſearch. In 1761, he was elected member of parliament for Hindon, and had a patent of precedence to rank as king's counſel, having before declined the office of chief juſtice of Ireland. In 1762, he collected and republiſhed ſeveral of his pieces under the title of "Law Tracts," in 2 vols. 8vo. In 1763, he was appointed ſolicitor-general to the queen, in the eſtabliſhment of her majeſty's houſehold, and barriſter of the Middle Temple. Having vacated his fellowſhip by his marriage, in 1761, he was immediately afterwards appointed principal of New Inn-hall, by lord Weſtmoreland, then chancellor of the univerſity. But in 1766, he reſigned both this office and his Vinerian profeſſorſhip.

The firſt volume of his lectures was publiſhed in 1765, under the title of "Commentaries on the Laws of England;" a work which ſir William Jones has characterized as "the moſt correct and beautiful outline that was ever exhibited of any human ſcience." In the execution of this undertaking, the author combines the humbler duty of an expoſitor with the higher character of a philoſophical writer on juriſprudence. Under the former character he is entitled to the higheſt praiſe. The ſtyle is correct, perſpicuous, and elegant; and the author has admirably contrived to connect amuſement with inſtruction, and to render the ſtudy of the law as agreeable as it is important and intereſting. Notwithſtanding the immenſe maſs of materials of which this comprehenſive work conſiſts, few errors have been detected in it, and it has been cited as a book of authority.

It has been objected, however, to theſe Commentaries, excellent as they are in a variety of reſpects, that in thoſe parts of them where the author examines the reaſons and principles of law, he does not inveſtigate them with a truly philoſophical ſpirit, and that he does not riſe above the ordinary level of thoſe writers who, in every country and age, have extolled their own municipal inſtitution as "the wiſdom of ages," and "the perfection of reaſon." In diſcuſſing the propriety of particular laws, it is ſaid that "his ingenuity is always occupied by the *forms* of juriſprudence; and inſtead of referring to public convenience and general utility, the ſole ſtandard of all rational legiſlation, he perpetually appeals to thoſe technical arguments which are dignified with the title of "legal reaſons." He is, in all caſes, the advocate and the apologiſt of exiſting inſtitutions; and it is the conſtant tendency of his work to juſtify whatever has been eſtabliſhed by antiquity, to diſcredit the improvements of modern times, and to expoſe to contempt or indignation all propoſals for further change. In his political principles he has been charged with being too much the advocate of prerogative; and his eccleſiaſtical opinions have been thought to incline towards intolerance. Notwithſtanding the undue deference to authority, with which this writer has been charged, there are many paſſages in his admirable work, in which he expreſſes a marked diſapprobation of ſtanding armies and military barracks, and in which he delineates the progreſs of the influence of the crown, and the probable effects of a further increaſe of the national debt. Theſe paſſages, however, have been attributed, by ſome of thoſe who have animadverted on his Commentaries, more to the ſpirit of the times, than to that of the writer. Several obnoxious paſſages in the eccleſiaſtical part of this work were pointed out by Dr. Furneaux and Dr. Prieſtley; but though the author had not magnanimity enough explicitly to acknowledge his errors, theſe paſſages were retrenched in ſubſequent editions. The political principles of the Commentaries were ſome years afterwards, viz. in 1776, more ſeverely noticed in a treatiſe entitled "A Fragment on Government," by Jeremy Bentham, eſq. To the honour of Mr. Blackſtone it ſhould be mentioned, that, notwithſtanding the ſeverity of this author's criticiſm, he afterwards became acquainted with him, and lived with him upon terms of regard and friendſhip.

Having given his opinion in parliament, on occaſion of the debates about the Middleſex election, that an expelled member was not eligible to the ſame parliament, and this opinion appearing to contradict the language of his Commentaries, he was violently attacked for this inconſiſtency by the celebrated Junius and others; but, though he defended himſelf with ingenuity, he inſerted the caſe of expulſion in the next edition of his work, of which he had before taken no notice, as one of the diſqualifications for a ſeat in parliament.

His diſtinguiſhed talents and meritorious ſervices entitled him, without doubt, to the notice and recompence of government. Accordingly, when he declined the offer of being ſolicitor-general, on the reſignation of Mr. Dunning, in 1770, he was appointed immediately afterwards one of the juſtices of the common pleas, which office he held, except for a ſhort interval, during which he accommodated Mr. Juſtice Yates by ſitting as one of the juſtices of the king's

king's bench, till his death. Towards the end of the year 1779, a dropsical disease, occasioned chiefly by early application, and by neglect of exercise, made rapid advances, and terminated in his death, Feb. 14th, 1780, in his 56th year. In private life, judge Blackstone was distinguished for mildness and benevolence, and for every domestic and social virtue. In studies and avocations that contributed to establish his own reputation, and to benefit both his contemporaries and posterity, he was eminently assiduous; and the intervals of leisure which he enjoyed in the later period of his life were devoted to schemes of local improvement in the neighbourhood where he resided, or to great public undertakings. The two volumes of Reports, which he left in MS. have been published since his death, in 2 vols. folio, with a preface containing Memoirs of his life; but their merit is said not to correspond with the fame of the author. He also left in MS. several small poetical pieces; and his notes on Shakespear inserted in Mr. Malone's Supplement, shew how well he understood, and how capable he was of appreciating, the excellence of that author. Life prefixed to Blackstone's Reports. Gen. Biog.

Blackstone, in *Geography*, a small river of America, which has its source in Ramshorn pond, in Sutton, Massachusetts; and, passing through Providence, discharges itself into Narraganset bay, at Bristol, receiving in its course several tributary streams.

BLACKSTONIA, in *Botany*. See Chlora.

BLACKWALL, Anthony, in *Biography*, a native of Derbyshire, was admitted a sizar of Emanuel college, in the university of Cambridge, in 1690. Having taken the degree of M. A. in 1698, he became head-master of the free-school at Derby, and lecturer of the parish of All-hallows in that town. In 1706, he excited notice by an edition of the "Moral Sentences of Theognis," with a new Latin version, together with notes and emendations. He also published, in 1718, "An Introduction to the Classics," 12mo. in which he displays their excellence, gives directions for studying them with advantage, and illustrates those rhetorical figures by which language is elevated and adorned. In 1722, he was appointed head-master of the free-school at Market Bosworth, in Leicestershire; and in this situation he prepared for the press his principal work, entitled "The Sacred Classics defended and illustrated; an essay humbly offered towards proving the purity, propriety, and eloquence of the writers of the N. T. in 2 parts 4to." This was published in 1725; and a second edition in 8vo. appeared in 1727. After his death, a second volume was published under the title of "The Sacred Classics defended and illustrated, the second and last volume, in 3 parts," 8vo. 1731. The design of the author, in this elaborate and learned work, was to vindicate the writers of the New Testament from the charge of barbarism in their language, and to shew that the words and phrases which they have used are to be found in the most approved classical writers. Many of the obscurities and seeming faults he attributes to transpositions and mistranslations, and he urges the necessity of a new version. See Bible. This book has been highly valued by biblical scholars; and a Latin translation of it was published at Leipsic, in 1736, by Christopher Wolfius. Nevertheless it has been thought by several very competent judges to be written with more zeal than solidity; and Dr. George Campbell, in his Preliminary Dissertation to his Version of the four Gospels, has attacked the fundamental principle of the work, and made several particular strictures upon it. Mr. Blackwall was eminently distinguished as a schoolmaster, and formed many good scholars, among whom was Richard Dawes, author of the Miscellanea Critica. In his school he used a Latin grammar composed by himself, and published in 1728 without his name. Sir Henry Atkins, bart., who had been one of his scholars, presented him, in 1726, with the valuable rectory of Clapham, in Surry; but he resigned it in 1729, and returned to Market Bosworth, where he died in 1730.

BLACKWATER, in *Geography*, the name of four rivers in England and Scotland. That of England rises near the middle of the county of Essex, and falls into the mouth of the Thames, where it forms a spacious bay called Blackwater bay. Those of Scotland are, 1st. in Bamfshire, 2d. in Berwickshire, and 3d. in Perthshire.

Blackwater, the name of several rivers in Ireland, one of which is very considerable. This rises in the mountains which separate the counties of Limerick and Kerry; and, taking a southern direction, divides the latter county from the county of Cork for about 12 miles. After passing at the foot of *Slieve-logher* mountain, from which it receives a large supply of water, it runs westerly across the northern part of the county of Cork, which is about 45 English miles. In this course it passes the flourishing towns of Mallow and Fermoy, to the former of which it was navigable in lord Orrery's time, and receives the rivers Allo, Awbeg, and Funcheon, besides many smaller streams. A few miles below Fermoy, it enters the county of Waterford, and continues in the same direction for 12 miles, when, having passed the ancient city of Lismore, it bends nearly at a right angle to the south at Cappoquin. At this town it becomes navigable, and in its course receiving the river Bride, and opening into two or three spacious loughs, it flows into the sea a little below the town of Youghal, which is situated on its western bank. This river passes for almost the whole of its course, which, without making any allowance for its great windings, is about 90 English miles, through a rich and well-wooded country, "equally remarkable," says Mr. Young, "for beauty of prospect and fertility of soil." The banks are crowded with a number of fine seats, some of which, as Dromana and Lismore castle, may vie with those in any country, and have furnished artists with beautiful landscapes. The cyder made in its neighbourhood is held in great estimation, being preferred to the best imported from England, and of course brings a very high price. The Irish name of this river was Auniduff, or *Awin-dubh*, the black river, and also *Awin-more*, the great river, to distinguish it from the *Awbeg*, or *Awin-beg*, which runs into it. The latter is the Mulla of the immortal Spenser, who had an estate on its banks, where he resided for a long time. In his marriage of the Thames, he has mentioned the Blackwater and several of its tributary streams, though not with geographical accuracy, as the Allo does not rise near Slievelogher, but has the Blackwater between it and that mountain.

"Swift Auniduff, which of the Englishman
Is called Blackwater, and the Lissar deep,
Sad Trowis that once his people overran,
Strong Allo tumbling from Slievelogher steep,
And Mulla mine, whose waves I whilom taught to weep."
Spenser's Fairy queen, b. iv. c. 11.

—2. Another river, called Blackwater, rises in the county of Tyrone, and, for the greater part of its course, divides that county from those of Monaghan and Armagh. The linen manufacture is extensively carried on in its neighbourhood, so that there are many bleach-greens. The flourishing little towns of Aughnacloy, Caledon, Blackwater town, Moy, &c. are on its banks; and its navigation to Lough Neagh, into the south-western angle of which it pours its waters, has been improved at a considerable national expence, on account of the collieries at Drumglass, in the county of Tyrone.—3. A river Blackwater rises in the

the county of Monaghan, and, having paſſed through Lough Ramor, unites its waters to thoſe of the Boyne at Navan. —There are alſo ſmall rivers of this name, one in the county of Longford, which joins the Shannon near Laneſborough, and one in the county of Wexford, which flows into St. George's channel at the place where Bannow formerly ſtood. Smith's Cork. Beaufort's Map. Holmes's Tour in the South, &c.

Blackwater *Town*, a ſmall town in the county of Armagh, in Ireland, on the river Blackwater, which has a linen market. Diſtance from Dublin 66 miles.

BLACKWELL, Thomas, in *Biography*, was the ſon of one of the miniſters at Aberdeen, and born in that city in the year 1701. He was educated at the grammar ſchool and mariſchal college of his native place, of which, in 1723, he was appointed Greek profeſſor, and in this office he contributed in no ſmall degree to promote Greek literature, and the ſtudy of the claſſics in general. In 1735, his "Enquiry into the Life and Writings of Homer," 8vo. was publiſhed without his name; and by its popularity ſerved to eſtabliſh his reputation for learning and ingenuity. Of this work, diſcuſſing a variety of topics without any very obvious connection, Dr. Bentley is ſaid to have remarked, "that when he had gone through half, he had forgotten the beginning; and that when he had finiſhed the peruſal of it, he had forgotten the whole." It is reckoned, however, the author's principal performance, and is both curious and entertaining. His "Letters concerning Mythology," 8vo. were publiſhed in 1748; and they were intended to eſtabliſh a regular ſyſtem of ancient fable, as an allegorical repreſentation of the religion, laws, and philoſophy of early times. The work is learned, fanciful, and deſultory. In this year Dr. Blackwell was appointed principal of the Mariſchal college, and allowed his office of Greek profeſſor. In 1751, he announced to the public his deſign of publiſhing a new edition of Plato's works; but this deſign was never executed. The firſt volume of "Memoirs of the Court of Auguſtus," 4to. was publiſhed in 1753; the ſecond in 1755; and the third, after the author's death, in 1764. The object of this work is to exhibit, in an elegant and popular form, the principal facts of Roman hiſtory, at the commencement and during the period of the public life and reign of Auguſtus. It is written with vivacity, and was at firſt well received; but the affected eaſe and familiarity of the ſtyle, united with a conſiderable degree of that pompous kind of pedantry, which diſplays not only erudition but a knowledge of the world, has contributed to lower its reputation. This work manifeſts alſo a republican ſpirit, not altogether free from party prejudice. The author's affected mode of writing increaſed as he advanced in years; and though it muſt be acknowledged, that he poſſeſſes genius and fancy, and had a relish for the beauties of ancient authors, he never acquired that ſimplicity of taſte, which leads to the true eaſe and elegance of compoſition. This peculiar ſtyle and manner of compoſition have been attributed to an injudicious imitation of lord Shaftesbury. Some years before his death Dr. Blackwell's health declined; and his diſorder being of the conſumptive kind, which he is thought to have increaſed by his abſtemious mode of living, he was under a neceſſity of remitting his ſtudies, and adviſed to travel: but with this view he could proceed no farther than Edinburgh, where he died in 1757, the 56th year of his age. His temper was ſingularly mild and equable; and he retained his natural vivacity and cheerfulneſs through the whole period of his illneſs, and till the hour of his death. In converſation he was inſtructive and entertaining; and he blended a conſiderable knowledge of the world and urbanity of manners with an extenſive acquaintance with ancient and modern authors. But it was his foible, that he was apt to aſſume the appearance of univerſal knowledge; and this weakneſs betrayed him into converſation on philoſophical and mathematical ſubjects, with which his acquaintance was very imperfect. Among his friends and correſpondents were many perſons of literary eminence; and it is ſaid, that his patrons propoſed to introduce him into the profeſſorſhip of modern hiſtory at Cambridge, if he had not died before a vacancy occurred. Biog. Brit.

Blackwell, Elizabeth, widow of Alexander Blackwell, M. D. author of "A New Method of improving cold, wet, and clayey ground," 1741, London, 8vo. Rejecting dung and other manures, he depended entirely on repeated ploughing and turning the ground. He died a miſerable death in Sweden. His widow, being left in indigence, undertook, by the advice of her friends, to publiſh an account of 500 medicinal plants, to be drawn, engraved, and the greater part of them coloured by herſelf. The plants were furniſhed by Rand and Miller, from the botanical garden, belonging to the company of apothecaries, at Chelſea. They are, in general, Haller ſays, faithfully delineated. In ſome parts, however, ſhe has failed. Not well inſtructed in the Linnæan ſyſtem, ſhe has not delineated the fibres or filaments of the flowers with the accuracy now required. A ſhort account is annexed of the medicinal virtues of each of the plants, ſome of which are extremely rare. The firſt volume of this work was firſt publiſhed in 1737, and the ſecond in 1739, when the whole was publiſhed in 2 vols. fol. under the title of "A curious Herbal, &c.;" and it is creditable to the authoreſs to ſay, that this bulky and expenſive work paſſed through ſeveral editions. The laſt, which came out in 1760, in 5 vols. folio, at Nuremburg, is furniſhed with a preface and conſiderable additions by James Trew. After his death, in 1769, a ſupplemental volume, conducted by Ludwig, Boſe, and Boehmer, was printed in 1773. This work has been in a great meaſure ſuperſeded by Dr. Woodville's SS. Medical Botany, in 4 vols. 4to. Haller. Bib. Bot. Pulteney's Hiſt. and Biog. Sketches of the Progreſs of Botany in England, vol. ii. p. 254.

BLACKWOOD, Adam, was born at Dumferline, in Scotland, in 1539, and educated at Paris under Turnebus and Dorat. He was particularly patronized by Mary queen of Scots; and when he had finiſhed his law ſtudies at Toulouſe, he obtained the office of counſellor to the preſidial of Poictiers, which was Mary's dowry-town. In this place he ſettled and married; and, during the impriſonment of Mary, took ſeveral journies to England with a view of ſerving her. He died in 1613. His religious and political ſentiments may be deduced from the titles of his works, which were written both in verſe and proſe. Of theſe the principal were, "Caroli IX. pompa funebris verſibus expreſſa," Paris, 1754; "De vinculo religionis et imperii, et de conjunctionum inſidiis, religionis fuco adumbratis," 1575; "Adverſus G. Buchanani dialogum de jure regni apud Scotos, &c." Poitiers, 1581; "Martyre de Marie Stuart, reine d'Ecoſſe," &c. &c. His account of the execution of Mary Stuart is a virulent invective againſt queen Elizabeth, her parentage, her right to the crown, her government, &c. His works were collected and publiſhed in a 4to. volume by Gabriel Naudé, in 1644, with an eulogy of the author prefixed. Moreri. Gen. Biog.

BLADDER, in *Anatomy*, is a membranous bag, ſerving as a reſervoir for ſome ſecreted fluid. That which is conſidered as the chief receptacle of this kind, is the urinary bladder. As the anatomy of theſe parts, in general, will be deſcribed with that of the organ which prepares the fluid which they are intended to contain; therefore, for the ſake of uniformity of method, the deſcription of the urinary bladder

bladder is given with that of the kidnies and other urinary organs. See KIDNEY.

BLADDER, *Diſeaſes of the*, in *Surgery*. This *viſcus* being ſupplied with nerves, blood-veſſels, abſorbents, and muſcular fibres, will be neceſſarily liable to all the common diſorders of ſoft parts; ſuch as *wounds*, *inflammation*, *ulceration*, *gangrene*, *palſy*, *contraction*, *dilatation*, *rupture*, &c. But, beſides theſe affections, the bladder is ſubject to other morbid changes, which occur very rarely or not at all in moſt other parts of the body. It is ſometimes included among the contents of a herniary ſac. See HERNIA. Partial bags, or ſacculi, may likewiſe form in the coats of the bladder, ſo as to retain one or more calculous bodies generated in the urine. See CALCULUS, CYSTOTOMY, LITHOTOMY, and STONE. Fungous, painful, and dangerous excreſcences ariſe alſo on the inner ſurface of this organ, which are frequently denominated *cancers*, and are perhaps equally fatal in their conſequences. Theſe diſorders will, in general, produce either a retention or a preternatural evacuation of urine, and require a peculiar plan of treatment adapted to the diverſity of ſymptoms. See URINE, *Retention of*, &c. &c.

BLADDERS, *veſiculæ*, in *Botany*, a kind of air-bags found in ſome ſpecies of fucus.

Vegetable bladders are found every where, in the ſtructure of the bark, the fruit, pith, and parenchyma, or pulp; beſides thoſe morbid ones raiſed on the ſurface of leaves by the puncture of inſects.

BLADDER, *ſwimming*. See AIR *bladder*.

BLADDERS, *oil*, in the *Anatomy of Plants*. See OIL-*bladders*.

BLADDER, *puceron*, in *Entomology*. See CHERMES.

BLADDER-*nut*, in *Botany*. See STAPHYLÆA.

BLADDER-*nut*, *African*. See ROYENA.

BLADDER-*nut*, *laurel-leaved*. See HOLLY.

BLADDER *ſena*. See COLUTEA.

BLADDER-*ſhaped*, *inflatus*, denotes inflated or diſtended like a blown bladder; ſuch are the cup of the bladder campion, and the bloſſom of the fig-wort.

BLADDER-*ſpout*. See UTRICULARIA.

BLADDER-*wort*, *common*. See UTRICULARIA.

BLADE, in *Agriculture*, a ſpire of graſs, or green ſhoot of corn.

BLADE, in *Anatomy*. See SHOULDER-*blade*.

BLADE *of an Anchor*, denotes that part of the arm on which the palm is ſhut.

BLADE, in *Commerce*, a thin ſlender piece of metal, either forged by the hammer, or run and caſt in moulds, to be afterwards ſharpened to a point, edge, or the like. Sword-blades are made by the armourers, knife-blades by the cutlers, &c. The Engliſh and Damaſcus blades are moſt eſteemed. Among the French, thoſe of Vienne and Dauphiny have the preference. The conditions of a good blade of a ſmall ſword are, that it be light and tough, apter to bend than break. When it will ſtand in the bend, it is called a *poor man's blade*.

BLADE *of a Chiſſel*, is the iron or ſteel part, as diſtinguiſhed from the wooden handle.

BLADE *of Mace*, or cinnamon, among apothecaries, are little ſlips or ſlices of thoſe barks.

BLADE *of an Oar*, is that part which is plunged into the water in rowing. On the length of this do the force and effect of the oar, in a great meaſure, depend.

BLADE *of a Saw*, the thin part wherein the teeth are cut, which, to be good, muſt be ſtiff, yet bend equally into a regular bow all the way, without yielding more in one place than another.

BLADE-*mill*, is that contrived for grinding iron tools, as ſcythes, reaping hooks, axes, chiſſels, and the like, to a bright edge.

BLADED, in *Heraldry*, is a term uſed when the ſtalk or blade of any kind of grain or corn is borne of a colour different from that of the ear or fruit: thus, *argent an ear of wheat or* BLADED *vert*.

BLADEN, in *Geography*, a county of North Carolina, in the diſtrict of Wilmington; having 6963 inhabitants, including 2278 ſlaves.

BLADENSBURG, a poſt town of America, in Prince George county, Maryland, on the eaſtern bank of the eaſtern branch of Patowmack river, at the confluence of the N. W. and N.E. branches, 9 miles from its mouth at the Federal city, 38 S.W. from Baltimore, and 12 N.E. from Alexandria, in Virginia. It contains about 160 houſes.

BLADHIA, in *Botany*, ſo named by Thunberg, from Peter John Bladh, a Swede, reſident at Canton. Lin. gen. Schreb. n. 370. Thunb. nov. gen. 6. fl. jap. 7. Claſs and order, *Pentandria Monogynia*. Gen. Char. *Cal.* perianth one-leafed, very ſhort, permanent, five-parted; parts ovate, concave, ſpreading, torn-ſubſerrate. *Cor.* one-petalled, wheel-ſhaped, five-parted; parts ovate, obtuſe, ſpreading. *Stam.* filaments five, very ſhort; anthers heart-ſhaped, acute, converging into a cone; ſhorter than the corolla. *Piſt.* germ ſuperior; ſtyle filiform, longer than the corolla; ſtigma ſimple, acute. *Per.* berry globoſe, crowned by the permanent ſtyle, one-celled. *Seed* ſingle, globoſe, involved in a membrane.

Eſſ. Char. *Cor.* wheel-ſhaped, deciduous. *Berry* containing one arilled ſeed.

Species, 1. B. *japonica*. Lin. Syſt. 236. Thunb. jap. 95. t. 18. Kœmpf. Amœn. 5. 776. (Quackitz.) "Leaves ſerrate ſmooth." 2. B. *villoſa*. Lin. Syſt. 237. Thunb. jap. 96. t. 19. "Leaves ſerrate, villoſe." 3. B. *criſpa*. Lin. Syſt. 237. Thunb. jap. 97. Kœmpf. Amœn. 5. 776. 2. ic. ſelect. t. 7. "Leaves oblong, curled, ſmooth." All theſe are natives of Japan. Thunberg has another ſpecies among his obſcure plants, jap. p. 350. Martyn.

BLADUM, in *Middle Age Writers*, is taken for all ſorts of ſtanding corn in the blade and ear. The word is alſo written *blatum*, *blava*, and *blavium*. In our old charters, the word bladum included the whole product of the ground, fruit, corn, flax, graſs, &c. and whatever was oppoſed to living creatures. The word bladum was ſometimes alſo applied to all ſorts of grain or corn threſhed on the floor: *tria quarteria frumenti, tria quarteria avenarum & unum quarterium fabarum, erunt quieti de ſolutione prædicti bladi in perpetuum*. But the word was more peculiarly appropriated to bread-corn, or wheat, called in French *bié*. Thus the Knights Templars are ſaid to have granted to ſir Wido de Meriton's wife *duas ſummas bladi*. Kennet's Paroch. Ant. and Du Cange.

Hence *bladarius* denotes a corn-monger, meal-man, or corn-chandler; and it is uſed in our records for ſuch a retailer of corn. Pat. 1 Ed. III. par. 3. m. 13. And *bladius* ſignifies an ingroſſer of corn or grain.

BLAE, in *Ornithology*, among French writers, an African bird of the falcon tribe deſcribed by Latham under the name of *falco melanopterus*, which ſee.

BLÆRIA, in *Botany*, ſo denominated from Patrick Blair, M.D. Lin. gen. n. 139. Reich. 145. Schreb. 183. Juſſ. 160. Claſs and order, *Tetrandria Monogynia*. Nat. Ord. *Bicornes*. *Ericæ*. Juſſ. Gen. Char. *Cal.* perianth four-parted; leaflets linear, erect, a little ſhorter than the corolla, permanent. *Cor.* monopetalous, campanulate; tube cylindric, the length of the calyx, pervious; border ſmall, four-cleft;

diviſions

divisions ovate, reflex. *Stam.* filaments four, setaceous, the length of the tube, inserted into the receptacle; anthers oblong, compressed, erect, obtuse, emarginate. *Pist.* germ. four-cornered, short; style setaceous, much longer than the corolla; stigma obtuse. *Per.* capsule obtuse, quadrangular, four-celled, gaping at the angles. *Seeds*, some roundish. *Obs.* The anthers are emarginate, but not horned, as in *erica*, allied to this.

Ess. Char. *Cal.* four-parted. *Cor.* four-cleft. *Stam.* inserted into the receptacle. *Caps.* four-celled, many-seeded.

Species, 1. B. *ericoides*, heath-leaved B. "Anthers awnless, standing out; calyxes four-leaved; bractes the length of the calyx; leaves in fours, oblong-acerose, hairy, imbricate." This has the stature of the common heath. Flowers terminating, white with a tinge of purple; corollas tubulous, erect; anthers two-parted, scabrous; style capillary, longer than the anthers. Introduced into Kew garden in 1774 by Mr. F. Masson. 2. B. *ciliaris*, ciliated B. "Flowers in a head, calyxes ciliate." Resembling the preceding, and readily known by its white calyxes, most distinctly ciliate. 3. B. *articulata*, jointed-leaved B. Penæa Sarcocolla. Berg. cap. 25. "Stamens protruded, two-parted; corollas cylindric." A distorted shrub, of the stature of common heath. Leaves in fours, pressed to the branches; heads of flowers terminating, with white-villose calyxes; corollas flesh-coloured; anthers very narrow, black; differing from the first in having equal stamens, and leaves more imbricated. 4. B. *purpurea*, purple-flowered B. "Stamens included, two-parted; corollas oblong, straight; flowers terminating, aggregate; peduncles erect." Like the third; but the heads are nodding. 5. B. *pusilla*, dwarf B. "Flowers scattered; corollas funnel-form." This has the stature of small heath. Branches pubescent; leaves in fours, rugged, petioled, scored underneath with a line; flowers minute, scattered, shorter than the leaves. 6. B. *muscosa*, moss-leaved B. Ait. Hort. Kew. 1. 150. "Anthers awnless, almost standing out; calyxes one-leafed, hairy; corollas bell-shaped, hairy in the upper part; flowers axillary; stigmas peltate." Found at the Cape of Good Hope by Mr. F. Masson, and introduced in 1774; flowering from June to August.

Propagation and Culture.—These are all shrubs, inhabitants of the Cape of Good Hope, require the same treatment and shelter with other Cape plants in the dry stove, and may be increased by cuttings, like the ericas, or heaths, which they much resemble. Martyn.

BLÆSLING, in *Ornithology*, one of the synonymous names of the *greater coot* of English writers, and *fulica aterrima* of Linnæus. Vide *Günther Nest. und. Eyer.* The common coot, *fulica atra* of Linnæus, is also named by this author *kleiner blæsling*.

BLÆSUS, in *Medicine*. See STAMMERING.

BLAGAITZKI, in *Geography*, a town of Croatia; 10 miles N.N.W. of Sluin.

BLAGNAC, a town of France, in the department of the Upper Garonne, and chief place of a canton, in the district of Toulouse, on the Garonne; 3 miles N.W. of Toulouse.

BLAGOVETSCHENSKOI, a town of Russia, in the government of Archangel, near the south-east coast of the White sea; 70 miles S.W. of Archangel.

BLAGRAVE, JOHN, in *Biography*, an English mathematician, was born of an ancient and honourable family at Bulmarsh court near Sunning in Berkshire, towards the middle or close of the 16th century, and educated, first at a school in Reading, and afterwards at St. John's college, Oxford. Before he took any degree he retired from the university to his patrimonial seat at South-cote lodge, near Reading, where he diligently pursued his studies, particularly mathematics. His works, of which we have any account, are, "A Mathematical Jewel," shewing the construction and use of an instrument so called, and its application to astronomy, cosmography, geography, &c. Lond. 1585, fol.; "The Construction and Use of the Familiar Staff, &c.," performing the geometrical mensuration of all altitudes, Lond. 1590, 4to.; "Astrolabium Uranicum generale," containing the use of an instrument, or astrolabe, Lond. 1596, 4to.; and "The Art of Dialling, in two parts," Lond. 1609, 4to. Mr. Blagrave was distinguished by his benevolence, both during his life, and at his death. Having never been married, he bequeathed 50l. to each of the children of his three brothers, or their posterity, payable at the age of 26; and his bequests in this way were so well adjusted, that near 80 of his nephews and their descendants were thus benefited out of his leasehold estate. He also bequeathed lands for producing an annual donation of 10l. to a maid-servant in the town of Reading, according to the directions of his will. These directions required, that the church-wardens of each of the three parishes should on Good Friday send one virtuous maid, who had lived five years with her master. The three maids were to appear in the town-hall before the mayor and aldermen, and to cast dice. She, whose throw was the greatest, received the ten pounds. The two maids who had lost were to appear the next year, together with a third added to them. Accordingly each maid was to have by his will the chance of three annual throws; but if any failed in three successive years, he orders new persons to be presented. On the same Good Friday, money is distributed to 80 widows in pursuance of his will, who attend a sermon, for which the preacher is to receive ten shillings. Mr. Blagrave died Aug. 9th, 1611, and was buried in the church of St. Lawrence, Reading, where a sumptuous monument is erected to his memory. Biog. Brit.

BLAGRE, in *Ornithology*. Under this name Levaillant describes the African species of eagle called by Latham *falco blagrus*, which see.

BLAIN, a distemper incident to beasts, consisting in a bladder growing on the root of the tongue against the windpipe, which at length swelling stops the breath.

It comes by great chafing and heating of the stomach; whereby, as some judge, it still grows and increases by more heat.

It is perceived by the beast's gaping, holding out his tongue, and foaming at the mouth: to cure it, cast the beast, take forth his tongue, and then slitting the bladder, wash it gently with vinegar and a little salt.

BLAIN, in *Geography*, a town of France, and principal place of a district in the Lower Loire. The population of the place consists of 1897 persons, and of the canton of 10,274; its territorial extent is 342½ kiliometres, and it includes 4 communes; 18 miles N.N.W. of Nantes, and 40 S. of Rennes.

BLAINVILLE, in *Biography*, a learned musician of Paris, who proposed, in 1751, a third mode or key, which he called *a mixed mode*, because it participates of the modulations of the two other, or rather from its being compounded of both, a mixture which the author does not regard as an inconvenience, but rather as an advantage and source of variety both in the melody and harmony. Rousseau. Dict. de Musique, published 1768.

BLAINVILLE, a performer on the violoncello, and music-master at Paris, who had many symphonies and motets performed at the Concert Spirituel, in the middle of the last century,

century, without ſucceſs; but abandoning the *practice* of harmony or compoſition, in order to try his force in the *theory*, in 1751, he produced "L'Harmonie theorico-practico;" in 1754, "L'Eſprit de l'Art Muſical;" in 1765, "L'Hiſtoire générale, critique, et philologique de la Muſique." Theſe works are no better than his ſymphonies. They are compilations without taſte, which teach nothing new to thoſe who know any thing about muſic already; and not enough to thoſe who know nothing. In 1751, he had the courage to publiſh as a diſcovery a pretended *new mode*, a key different from the major and minor, which, he ſaid, was neither major nor minor, but *mixed* of both. He compoſed a ſymphony in this new mode, and had it performed at the Concert Spirituel, which gave birth to many diſſertations and diſcuſſions, &c. Laborde, Eſſai ſur la Muſique, tom. iii. p. 577.

"Who ſhall decide, when doctors diſagree?"

The *new mode*, as it was called, was attacked by the ingenious and ſpeculative writer on muſic, M. Serre, of Geneva, and defended by Rouſſeau in his Dictionary. Thirty years after, it became the ſubject of a very long article in M. Laborde's Eſſai ſur la Muſique, merely to attack Rouſſeau for having defended it. In this attack of the dead lion, the abbé Rouſſier was *bottle-holder* to his friend Laborde.

All theſe gentlemen ſeem utterly ignorant of the church muſic of the 15th and 16th century, built on the ancient eccleſiaſtical modes, in which nothing was more common in the maſſes of the old maſters, than for a movement beginning in A minor to end on the fifth of that key, with a ſharp third, which would be called now a *ſemi-cadence*. The melody of the ſeveral parts is equally in the ſcale of C and A natural, which, without accidental flats or ſharps, produces nothing but different ſpecies of octaves in the key of C natural. But calling E the key note inſtead of A, it has a peculiarity in the ſecond, which, inſtead of being a tone major above the key note, is only a major ſemitone.

Now Dr. Pepuſch, who rigidly adhered to the laws of the eccleſiaſtical modes in his "Treatiſe on Harmony," ſo late as 1731, in ſpeaking of the key of E as formed of one of the ſpecies of octave in the ſcale of C natural, has explained the properties of this key with only a major ſemitone for its ſecond, much better than Blainville, or any of his defenders or opponents, and terminates his remarks on this key, by ſaying that "it differs from all others; for *they* are introduced by the ſemitone major *below* them, but this is by the ſemitone major *above* it; *they* by their *ſeventh* major, but *this* by its *ſecond*, which happens to be *minor; that is* from F downwards to E. It is becauſe of this difference and peculiarity in its modulation, which makes what is compoſed in it to be very *ſolemn*, that this key is as it were appropriated to church-muſic, and called by the Italians *tuono di chieſa*." p. 65.

But the doctor does not call it a *new key*, for it is as old as counterpoint; and we ſhould ſuppoſe that Blainville had either ſeen Dr. Pepuſch's treatiſe, or found in ſome old maſs a movement that ended on the fifth, inſtead of the key note, and wiſhed to paſs for an *inventor*. But it is plain that all the French gentlemen, who took a part in this controverſy, were diſputing about the *dent d'or*, before they had aſcertained its exiſtence. In examining the maſſes of Joſquin, Paleſtrina, and the cantiones of Tallis and Bird, we find movements of the deſcription of Dr. Pepuſch's *tuono di chieſa*. And in Padre Martini's "Saggio di Contrepunto," tom. i. p. 42. he calls this mode *il terzo tuono autentico*, the third authentic mode, which Blainville calls the *new* or *mixed* mode; and P. Martini even calls it *terzo tuono* miſto *del quarto ſuo plagale*, p. 44. He gives the ſame natural ſcale for its intervals as Rouſſeau and Blainville, EFGABCDe, p. 51. An example of this *mixed* mode is given from Paleſtrina, in which no accidental ſharps are marked, though it modulates into G major, A minor, C ♮, and G, a ſecond time. A ſharp only is given to G upon the cloſe note, as ſharp third to the final E.

In 1756, Blainville publiſhed what he called "A general, critical, and philological Hiſtory of Muſic;" a work for which the author's materials ſeem to have been ſo ſcanty, that he was reduced to fill two-thirds of his thin quarto with an indigeſted treatiſe on compoſition. See Pepuſch, p. 65, and examples 151 and 176.

Blainville, in *Geography*, a town of France, in the department of La Manche, or the Channel, and chief place of a canton, in the diſtrict of Coutances, five miles weſt of Coutances, and 13 north of Granville.

Blainville *ſur l'Eau*, a town of France, in the department of the Meurte, and chief place of a canton, in the diſtrict of Luneville, four miles S. W. of Luneville, and 12 S. E. of Nancy.

BLAIR, John, in *Biography*, a chronologer and geographer, was born in Scotland, and educated at Edinburgh. Upon his firſt arrival in England, he was uſher at a private ſchool; and firſt appeared with ſingular advantage before the public by publiſhing, in 1754, a work intitled "The Chronology and Hiſtory of the World, from the Creation to the year of Chriſt 1753, illuſtrated in 56 tables, of which four are introductory, and contain the centuries prior to the firſt olympiad; and each of the remaining 52 contains in one expanded view 50 years, or half a century; by the Rev. John Blair, L.L.D." This comprehenſive work, on which the author muſt have beſtowed a very great degree of attention and labour, was publiſhed by ſubſcription, and dedicated to lord Hardwicke; and the author acknowledges great obligations to the earl of Bath. Dr. Blair appears at this time to have taken orders in the Engliſh church; in 1755, he was elected fellow of the Royal Society, as he was of the Antiquarian Society, in 1761. In 1756, he publiſhed a ſecond edition of his Tables, and in 1757, he was appointed chaplain to the princeſs-dowager of Wales, and mathematical tutor to the duke of York. In 1761, he obtained a prebendal ſtall at Weſtminſter, and ſeveral church preferments in very quick ſucceſſion. From the vicarage of Hinckley, in Leiceſterſhire, which he held, by diſpenſation, with the rectory of Burton Coggles, in Lincolnſhire, he was promoted firſt to the vicarage of St. Bride's, in London, in 1771, and in 1776, to the rectory of St. John the Evangeliſt in Weſtminſter, with which he held that of Horton near Colebrooke, in Buckinghamſhire. During the years 1763 and 1764, he accompanied the duke of York in his travels on the continent. In 1768, he publiſhed an improved edition of his "Chronological Tables," which he dedicated to the princeſs-dowager; and to this edition he annexed 14 maps of ancient and modern geography, and prefixed a diſſertation on the riſe and progreſs of this ſcience, which was alſo printed ſeparately in 12mo. His death, which happened June 24th 1782, was probably accelerated by the ſhock that attended the news of his brother, captain Blair's death in the memorable ſea-fight of April 12, 1782; more eſpecially as he then was ſeverely afflicted with an epidemic influenza. After his death, in 1785, his "Lectures on the canon of the Scriptures, comprehending a diſſertation on the Septuagint verſion," were publiſhed; and a new edition of his "Chronological Tables," extended to the year 1790, appeared in that year. Biog. Dict.

Blair, Patrick, practiſed phyſic and ſurgery at Dundee, in Scotland, where he was probably born. He firſt became known, in 1706, by his account of the anatomy of an elephant, which he had the opportunity of diſſecting there. It was publiſhed in the Philoſophical Tranſactions, Nos. 326 and

and 327, in the year 1710. It contains an accurate description of the proboscis and its muscles, and confirms, Haller says, the opinion formerly given, that the elephant has no gall bladder. In a subsequent number of the Transactions, he gives a description of the osficula auditus, accompanied with engravings. In the rebellion, in 1715, being suspected, on account of his religious principles, of hostility to government, he was for a small time confined. He came afterwards to London, where he re-published his "Anatomy of the Elephant," in 4to.; and, in 1718, published a volume of "Miscellaneous observations on the practice of physic, anatomy, surgery, and botany," in 8vo. This was followed, in 1720, with "Botanical Essays," in two parts, also 8vo. with figures, in which he treats of the sexes of plants, confirming the arguments adduced in proof of them by sound reasoning, and some new experiments of the manner of fecundation, of the circulation of the sap, &c. This work still retains its credit among botanists, although some of the author's opinions are abandoned. About the same time, he gave an account of the asbestus, found in the county of Angus, in Scotland, printed in the Phil. Trans. N° 333; and of the dissection of an emaciated child, in which he could find no vestige of the omentum, Id. N° 353; and also of a boy, who lived a considerable time without food, Id. N° 364; and in the same number is also a dissertation on the means of discovering the medicinal properties of plants from their external figure. He soon after settled at Boston, and published "Pharmaco-botanologia," or an alphabetical and classical dissertation on all the British indigenous and garden plants of the London Dispensatory, in seven decades, 4to. 1723 and 1728, introducing some plants which he had first discovered growing near Boston. The work only proceeded to the letter H. The time of his death is not known. Haller Bib. Anat. et Botan. Pulteney's Sketches, vol. ii. p. 134, &c.

Blair, James, an episcopalian divine, was born and educated in Scotland, where he was ordained and beneficed; but meeting with some discouragements in that country, he quitted his preferments, and removed to England, about the latter end of the reign of king Charles II. Being introduced to Dr. Compton, then bishop of London, he prevailed on him to go, about the year 1685, as a missionary to Virginia, where by his conduct and ministerial labours he was eminently serviceable in promoting the cause of religion. In 1689, he was appointed by the same prelate as his commissary for the province. Intent upon doing good in the office with which he was entrusted, he observed with concern, that the want of proper seminaries for religion and learning obstructed every attempt for propagating the gospel in this colony: and he therefore formed the benevolent design of erecting and endowing a college at Williamsburg, the capital of Virginia, for professors and students in academical learning. With this view he raised a considerable sum of money by voluntary subscription; and, in order the more effectually to accomplish his purpose, he came over into England in 1693, to solicit the concurring aid of government. King William and queen Mary very much approved the design, and accordingly a patent was issued for erecting and endowing a college, which was to be denominated from its founders, "the college of William and Mary." Mr. Blair, who first projected the scheme, was appointed president of the college. (See Williamsburg.) He was also rector of Williamsburg and president of the council in that colony. Having faithfully and honourably discharged the duties of his office as president of the college for about 50 years, and those of his ministerial function for above 60 years, he finished his course of laborious and useful service in the year 1743. His works, comprising "Our Saviour's divine Sermon on the Mount explained, and the practice of it recommended, in divers sermons and discourses, with a recommendatory preface, by the Rev. Dr. Waterland," were published in 1740, 4 vols. 8vo. Waterland's Preface. Burnet's Hist. of his own Times, vol. iii. p. 165. 8vo.

Blair, Hugh, a distinguished preacher and writer, the descendant of an ancient family of Ayrshire, in Scotland, and the son of a respectable merchant at Edinburgh, was born in that city, April 7th, 1718. As his views were at an early period directed towards the church, he entered the university of his native place in 1730, and spent eleven years in the assiduous prosecution of those literary and scientific studies which the church of Scotland prescribes to such as profess themselves candidates for the ministerial office. During this period his application and proficiency gained repeated testimonies of approbation from the professors under whom he studied. One of his performances at this time, indicating the bent of his genius towards polite literature, was an essay Περὶ τοῦ καλοῦ, or "On the Beautiful," which afforded such satisfaction to professor Stevenson, that it was appointed to be publicly read at the conclusion of the session. This honour, without doubt, stimulated his emulation, and proved the earnest of his future fame. The method of study, which he commenced at college, and which he occasionally practised in his maturer years, contributed in a considerable degree to the accuracy and extent of his knowledge. It consisted in making abstracts of the most important works which he read, and in digesting them according to the train of his own thoughts. This was the method in which he studied history in particular; and with this view, aided by some of his youthful associates, he constructed a comprehensive series of chronological tables, in which was inserted every important fact that occurred. In conformity to this plan, his learned friend, Dr. John Blair, formed his valuable work, already noticed under his article. In 1739, Mr. Blair took his degree of master of arts; and on this occasion he printed and defended, in elegant Latin, a thesis, "De Fundamentis et Obligatione Legis Naturæ." Having completed his academical course, he passed through the customary trials before the presbytery of Edinburgh, and was licensed as a preacher, October 21st, 1741; and in the following year he was presented to the parish of Coleffie, in Fife, where he was ordained Sept. 23d, 1742. Such at this time was his established reputation as an eloquent preacher, that when a vacancy occurred in the Canongate church of Edinburgh, he was chosen at a contested election to supply it; and accordingly he returned to his native city in July 1743. In this situation he continued for eleven years, exhibiting specimens of those talents for pulpit compositions, which have since obtained distinguished testimonies of public approbation. In 1754, he was translated from the Canongate to lady Yester's, one of the city churches; and in 1758, he was promoted to the High Church of Edinburgh, the most important ecclesiastical charge in North Britain. To this honourable rank he was advanced at the request of the lords of council and session, and of other distinguished persons holding public offices, who attend that church; and the wisdom of their choice was amply justified by the prudence, ability, and success, with which his ministerial labours were conducted for a period of more than 40 years. Previously to his advancement to this station of public service, Mr. Blair's attention seems to have been almost wholly devoted to the attainment of professional excellence, and to the regular discharge of his parochial duties. Of the productions of his pen, we have only two sermons, preached on particular occasions; some translations, in verse, of passages of Scripture for the psalmody

pſalmody of the church; and a few articles in a periodical publication intitled the "Edinburgh Review." See JOURNAL. From this time he enjoyed greater leiſure for directing his views to other important literary objects, beſides his weekly preparations for the pulpit; and, accordingly, he commenced, Dec. 11, 1759, with the approbation of the univerſity, a ſeries of lectures on compoſition. Of his qualifications for an office of this kind, none could entertain the leaſt doubt; they had been in ſome meaſure ſanctioned by the univerſity of St. Andrew's, which, in June 1757, had conferred on him the degree of doctor in divinity, then very rarely beſtowed; and the ſucceſs that attended his firſt courſe, afforded ample evidence of the able manner in which it had been conducted. The patrons of the univerſity determined in the following ſummer to inſtitute a rhetorical claſs, under the direction of Dr. Blair, as a permanent part of their eccleſiaſtical eſtabliſhment; and on the 7th of April 1762, his majeſty was graciouſly pleaſed "to erect and endow a profeſſorſhip of rhetoric and belles lettres in the univerſity of Edinburgh, and to appoint Dr. Blair, in conſideration of his approved qualifications, regius profeſſor thereof, with a ſalary of 70l." The lectures which he delivered on this occaſion, were publiſhed in 1783, under the title of "Lectures on Rhetoric and Belles Lettres," in two volumes, 4to.; and they have been ſince frequently re-publiſhed in 3 vols. 8vo. Of theſe lectures it will be ſufficient to obſerve, that the general voice of the public not only in our own country, but in other nations on the continent into whoſe languages they have been tranſlated, has pronounced them to be a moſt judicious, elegant, and comprehenſive ſyſtem of rules for forming the ſtyle, and cultivating the taſte of youth. By a happy and ſingular union of taſte and philoſophy, the author has ſupplied a great defect in the ſcience of criticiſm, and has made a valuable addition to the polite literature of the preſent age. In the courſe of this Dictionary we ſhall have frequent occaſions for referring to this excellent work, and availing ourſelves of its intereſting and uſeful contents. In 1763, Dr. Blair publiſhed "A Critical Diſſertation on the poems of Oſſian," which for beauty of language, delicacy of taſte, and acuteneſs of critical inveſtigation, has few parallels. As it was partly by his ſolicitation, that Mr. Macpherſon was induced to publiſh his "Fragments of Ancient Poetry," it is no wonder, that, independently of the teſt of criticiſm, he ſhould be a zealous advocate in favour of their authenticity and antiquity; but, notwithſtanding his able defence, a degree of ſcepticiſm has prevailed on this ſubject.

Dr. Blair's reputation as a preacher, or rather as a compoſer of ſermons, had been for a long time acknowledged by thoſe who had the pleaſure of attending on his miniſtry; but it was not till the year 1777, that he could be induced to favour the world with a volume of the diſcourſes which had ſo long furniſhed inſtruction and delight to his own congregation. The MS. of this volume, it is ſaid, was received by the bookſeller with ſome heſitation; but it was no ſooner publiſhed, than he found it his intereſt to engage the author to furniſh him with other volumes. Accordingly five volumes, in the whole, have been publiſhed at different intervals; and we may venture to affirm, that liberally as the author was recompenſed, no collection of ſermons has ever been more profitable to the bookſeller, or more acceptable to the public, than Dr. Blair's. The circulation of them was rapid and extenſive. They were tranſlated into ſeveral foreign languages; and they received a royal reward. A penſion of 200l. a year, iſſuing out of the exchequer in Scotland, was conferred, in 1780, on the author, and it was continued without any alteration till his death. Theſe ſermons, though they poſſeſs various degrees of comparative excellence, and ſome muſt be allowed to be much ſuperior to others, are upon the whole models in their kind; and they will long remain as monuments of the piety, the genius, and ſound judgment of the author. Occupying a middle place between the dry metaphyſical diſcuſſions or controverſial ſpeculations of one claſs of preachers, and the looſe incoherent declamations of another, they blend the light of argument with the warmth of exhortation, the elegance of compoſition with judicious obſervations on human life, and practical knowledge with important principles of religion and virtue. The laſt volume was prepared for the preſs by the author after he had completed his eighty-ſecond year, and delivered to the publiſhers about ſix weeks before his death. Although he left many other diſcourſes in manuſcript, he explicitly enjoined that they ſhould be deſtroyed, and thus wiſely prevented that injury to his reputation which has ſometimes been the reſult of poſthumous publications. The author's fame, as a preacher, depended principally, if not wholly, on the intrinſic excellence of his diſcourſes, with reſpect to matter and compoſition; for we are informed, that his delivery, though diſtinct, ſerious, and impreſſive, was not remarkably diſtinguiſhed by that magic charm of voice and action, which captivates the ſenſes and imagination, and which, in the eſtimation of ſuperficial hearers, conſtitutes the chief merit of a preacher. Dr. Blair, in the exerciſe of his profeſſional duties, as far as they regarded the government of the church, was ſteadily attached to the cauſe of moderation. Diffident and unaccuſtomed to extemporary ſpeaking, he declined interfering in eccleſiaſtical politics, and never would conſent to become moderator of the general aſſembly of the church of Scotland; nevertheleſs, his opinion, which was always guided by ſound judgment, uniformly commanded deference and reſpect. Whilſt he was anxious to preſerve the church from a ſervile corrupting dependence on the civil power, on the one hand; it was his wiſh, on the other, to prevent a greater infuſion of democratical influence than he thought to be compatible with good order, and the eſtabliſhed conſtitution of the country. His reputation in public life was well ſuſtained by the great reſpectability of his private character; and he was eminently diſtinguiſhed through life by the prudence, purity, and dignified propriety of his conduct. With a mind free from envy, and yet not inſenſible to the eſtimation in which he himſelf was held; inflexibly upright, and yet condeſcending to his friends, and diſpoſed to enjoy the pleaſures of ſocial intercourſe; few men have paſſed through life more univerſally reſpected by thoſe who knew him, more ſincerely eſteemed in the circle of his acquaintance, or more tenderly beloved by thoſe who enjoyed the benefit of his private and domeſtic connection. His wife, to whom he was married in 1748, contributed for almoſt half a century to his felicity, and was taken from him a few years before his death; and his two children, a ſon and a daughter, died, the former in infancy, and the latter in her 21ſt year. His conſtitution was naturally delicate and feeble; but he enjoyed, upon the whole, a ſtate of good health; and by habitual cheerfulneſs, temperance, and care, ſurvived the uſual term of human life. He retained his faculties to the laſt ſtage; and after a ſhort illneſs of three days, expired on the 27th of December, 1800, with the compoſure and hope of a Chriſtian paſtor; and his funeral ſermon was preached by Dr. Finlayſon, who has annexed to the fifth volume of his Sermons a ſhort account of the life and character of the author, from which the preceding article is chiefly compiled.

BLAIR, in *Geography*. See ATHOL.

BLAIREAU, in *Zoology*, the common French name of

of *ursus meles*, or badger. A variety of a white colour found in New York is also called in France *blaireau blanc*.

Blaireau *puant du Cap de Bonne Esperance*. Kolbe, and after him Abbé de la Caille, have described under this title a little quadruped found in the interior of Africa, which exhales a most insupportable odour. Whether it be of the badger kind in reality, or not, is uncertain. Sonnini believes it to be of the civet kind, *viverra Capensis*; and on the contrary, Gmelin supposes it to be of the glutton kind, perhaps a variety of *ursus gulo*.

BLAIRIA, in *Botany*. See Verbena.

BLAISE, St., *Order of*, was founded in Armenia, about the commencement of the twelfth century. The habit of the knights of this order was a sky-blue; and on the breast thereof was embroidered their badge, being a *cross of gold*.

Blaise. *St. Blaise and the Virgin Mary* was an order ecclesiastical and military. The particular time of its institution is not absolutely ascertained; but it is universally agreed that it took place soon after that of the Knights Templars. The badge of the order was a *red cross, on the centre of which was a medallion with the image of St. Blaise enamelled thereon*. When the knights assembled in chapter, or set out on any military expedition, they wore on their breast the same badge embroidered on a white habit.

Blaise, in *Geography*, a town of France, in the department of the Upper Marne, and chief place of a canton, in the district of Chaumont, 12 miles N.N.W. of Chaumont. —Also, a river of France, which runs into the Marne near Larzicour, in the department of the Marne.

Blaise, or Blas, St., a cape on the coast of West Florida, in the gulf of Mexico. It is a promontory, which separates the bay of Apalache on the east from that of St. Joseph, forming a kind of shepherd's crook. N. lat. 29° 40′. W. long. 86°.

BLAISOIS, a province of France before the revolution, bounded on the east by Orleannois, on the south by Berry, on the west by Touraine, and on the north by Vendomois and Dunois. The capital was Blois, which see.

BLAISON, a town of France, in the department of the Mayne and Loire, and chief place of a canton, in the district of Angers; 8 miles S.E. of Angers.

BLAKE, Robert, in *Biography*, a celebrated English admiral, was a descendant of an ancient family of the name in the parish of Spaxton and county of Somerset, and born at Bridgwater, in August, 1589. Having received the rudiments of grammar learning at a free school in his native town, he became a member of St. Alban's hall, Oxford, in 1615, and translated himself from thence to Wadham college, where, in 1617, he took the degree of bachelor of arts. In 1619, he lost a fellowship of Merton college, for which he was a candidate, on account of his low stature; sir Henry Savile, the warden, paying particular respect to personal comeliness. Soon after the year 1623, in which he wrote a copy of verses on the death of Mr. Camden, he left the university, where he had been noticed for his early rising and application to study, and lived privately at Bridgwater. Adopting at an early period republican principles, and prejudiced against the ecclesiastical establishment, by the severity with which Dr. Laud, then bishop of Bath and Wells, enforced uniformity in his diocese, he inclined also to those opinions that were deemed puritanical. Accordingly the puritan party prevailed in procuring his return as a member for his native town, to the parliament of 1640, but for the Long Parliament he lost his election. Upon the breaking out of the war between the king and parliament, he declared for the latter, and entering into military service, was soon appointed captain of dragoons. In this capacity he exhibited proofs of his talents by an obstinate defence of Bristol against the attack of prince Rupert, which he was at length obliged to surrender. In 1644 he was appointed governor of Taunton, which he had surprised and taken possession of for the parliament, and which he defended with a small but well-disciplined garrison, during a vigorous siege by the king's forces, till he obtained relief. For this service the parliament voted Blake, who was then colonel, a present of 500 pounds. After the murder of the king, which he is said to have disapproved, he cordially joined the republican party, and was reckoned, next to Cromwell, the ablest and most successful officer in the service of the parliament. Without affecting the character of a politician, he thought it his duty to serve his country to the utmost of his power, and to execute any measures that were adopted by the party to which he was attached, and by the existing government for this purpose. Early in the year 1649, he was appointed, in conjunction with Col. Deane and Col. Popham, to the command of the fleet; and his first naval expedition was directed, in 1649, against prince Rupert and prince Maurice, to the harbour of Kingsale in Ireland; where he blocked them up for some time, and whence he pursued them to Lisbon, whither they had fled for the protection of the king of Portugal. War being declared on this account against the Portuguese, Blake annoyed their trade, and took several rich prizes; and he afterwards proceeded, first to Carthagena and then to Malaga, in pursuit of prince Rupert. At the latter place he burnt and destroyed his whole fleet, two ships excepted; and in the beginning of the year 1651, he returned with his squadron to Plymouth, where he received the thanks of the parliament, and was appointed warden of the cinque ports. In the following year he was constituted one of the admirals and generals of the fleet, and employed in reducing the isles of Scilly and the island of Guernsey. Having accomplished this service, he was elected one of the council of state; and in 1652, promoted to the rank of sole admiral for nine months, in the prospect of a Dutch war. The States, jealous of the naval power of England, determined to reduce it by a very vigorous effort. With this view they dispatched Van Tromp with 45 sail of men of war into the Downs, who was met by Blake with a much inferior force of 23 ships, and, after a very severe action, which took place May 19th 1652, obliged to retreat. After several skirmishes with the Dutch ships, and the capture of many prizes, during the progress of the summer, Van Tromp appeared again in the Downs, towards the close of the year, with 80 ships, for the purpose of renewing his attack upon Blake. The English admiral, whose force was much inferior, and who had the disadvantage of an unfavourable wind, disdained however to retreat, and engaged the enemy on the 29th of November. Notwithstanding every possible exertion, he lost six ships, and was compelled to retreat into the Thames with his shattered fleet; and Van Tromp was left in triumphant possession of the channel. Blake lost no time in repairing and recruiting his fleet; and in February 1653, he set sail in pursuit of his antagonist. On the 18th day of the month the English admiral, with 80 ships of war, came up off Portland with Van Tromp, who had 70, and a fleet of 300 merchant ships under his convoy. The engagement was such as seldom occurs in the history of naval combats; it lasted three days, and on both sides equal valour was displayed; at length, however, after a running fight up the channel, the Dutch anchored safely in the sands of Calais, having lost 11 men of war, 30 merchant-ships, and 1500 men who fell in the action, whilst the English lost only one ship, but as many lives as the enemy. In this action Blake was wounded in the thigh.

At this time Cromwell dismissed the parliament, and assumed the supreme power; nevertheless, Blake and his colleagues declared their fixed purpose to serve their country faithfully, and to guard it, by every effort in their power, against foreign injury and insult. "It is not for us," said Blake, "to mind state affairs, but to keep foreigners from fooling us." Accordingly, when generals Monk and Deane, on the 23d day of June, had engaged Van Tromp with a fleet of 120 men of war, with dubious success, and with the loss of several men, among whom was Deane, Blake on the next day came up to their assistance with 18 fresh ships, and gained a victory so complete, that if the Dutch had not again saved themselves on the sands of Calais, their whole fleet must have been sunk or taken. After this engagement, his health being much impaired, he took his seat in the new parliament, summoned by the protector Oliver, as a representative of his native town, and he was constituted one of the commissioners of the admiralty. Cromwell indeed treated him with great respect; but he was not unapprized of the admiral's strong inclination to a commonwealth; and he was therefore the more disposed to send him, in November 1654, with a strong fleet into the Mediterranean, for the purpose of supporting the honours of the English flag, and procuring satisfaction for any injury which the British merchants had suffered. Whilst he lay in the road of Cadiz, he was treated with great respect by the Dutch and French, and even by the Algerines. However on the 10th of March in the following year he appeared before Algiers, and demanded satisfaction for the piracies committed on the English, and a release of all English captives. He then sailed to Tunis on the same errand; but the dey, confiding in the strength of the place, treated Blake's message with contempt; "Here," said he, "are our castles of Goletta and Porto Ferino, do your worst; do you think we fear your fleet?" Blake curling his whiskers, as he was accustomed to do when in a passion, consulted his officers, and then bore into the bay with his heavy ships; demolished the castles, burnt all the shipping in the haven of Tunis, and forced the haughty and obstinate dey to an humble submission, and an advantageous peace. This daring action spread the same terror of his name through Africa and Asia, which had for a long time prevailed in Europe. He also awed the piratical state of Tripoly into a peace with England, and the knights of Malta into a composition for the injuries which they had committed. Such was the effect of these exploits on the princes and states of Italy, that most of them thought fit to pay their compliments to the protector; and the grand duke of Tuscany, and the free state of Venice, in particular, sent magnificent embassies for that purpose. During the war with Spain, which was carried on with great spirit at this time, Blake, in pursuance of the protector's order, exerted himself in ruining their maritime force in Europe, and Montague being joined with him, on account of his declining state of health, blocked up for several months a Spanish squadron in the bay of Cadiz, and detached a part of their fleet to capture the Spanish plate fleet. Montague returned to England with the prizes; but Blake, whose constitution was broken by the dropsy and scurvy, staid behind; and in April 1657 sailed with 25 men of war in pursuit of another plate fleet which had put into Santa Cruz in the island of Teneriffe. Upon his arrival, he found that the governor had used every possible precaution for the defence of the harbour; 16 Spanish ships were disposed in a circular form within the bay, and strongly barricadoed; and the entrance was guarded by a castle and 7 forts, connected with one another, and furnished with large cannon. Blake steered boldly into the bay, leaving some of his ships to silence the batteries, while with the rest he attacked the Spanish vessels. Having driven the enemy from all their fortified posts, he set fire to the shipping, which it was impossible for him to remove, and destroyed the whole, to an immense amount. Having accomplished his object, the wind veered about in his favour and brought him out again without the loss of a single ship. This exploit has been censured by some cool politicians as an act of rashness; but such timid reasoners should consider that by such acts of valour the British navy has made the world to tremble. On this occasion the brother of the admiral was found deficient in some service which was expected from him; upon which he was degraded from his command, and sent home to his own country, though afterwards he shared the fraternal regard of Blake, in whose mind genuine patriotism absorbed every selfish and partial interest. This great enterprise was the last act of Blake's public life; the news of it at home was honoured with a public thanksgiving, with a vote of thanks to all the officers and seamen, and with a diamond ring, of the value of 500 *l.* to Blake himself. He lived to receive this welcome tribute of the gratitude and respect of his country, to the prosperity and glory of which he was invariably devoted. As his end approached, he wished to return to his native land; as he drew near, he often anxiously inquired for land; but before he could see it, he died as he was entering Plymouth sound, on board his ship the St. George, August the 17th 1657, at the age of about 59 years. His body was embalmed, and interred with singular honours in Henry the Seventh's chapel, Westminster; but after the restoration in 1661, it was removed and interred in St. Margaret's church yard. Blake was, with regard to his person, of low stature, of a quick, lively eye, and martial aspect, he was singularly brave, cool in action, and wise in the disposition of those desperate attacks, which men of a colder temperament have judged rather fortunate than expedient. He loved his country, and whatever was the established government, he was solicitous to do his duty; and this duty he performed with the most upright and disinterested views; for notwithstanding the high and lucrative posts which he occupied, and the many rich prizes which he captured, he only added to his own original patrimony about 500 pounds. He was pious without affectation, strictly just, and liberal to the extent of his fortune. His officers he treated with the familiarity of friends, and he was truly a parent to his sailors. Although no epitaph or sculptured monument records his great and good qualities, all parties have been eager to do justice to his memory. Dr. Bates, physician to king Charles I., the protector Oliver, and king Charles II., sums up his character in the following words: "He humbled the pride of France, reduced the Portuguese to submission, broke the strength of the Dutch, and drove their fleets out of the sea, subdued the pirates in the Mediterranean, and twice triumphed over the Spaniards, blameable only in this, that he joined himself with the parricides." Lord Clarendon says of him, that he was the first man that declined the old track, and disregarded anciently established rules, which served merely to keep his ship and his men out of danger; he first taught ships to contemn castles on shore; he first infused that courage into seamen, which made them learn by experience what mighty things they could do if they were resolved, and taught them to fight in fire as well as upon water; and though he hath been very well imitated, he was the first that gave the example of that kind of naval courage, and bold, resolute atchievements. Bishop Burnet mentions a story that is related of him, well known, but worth again recording. Whilst he lay in the road of Malaga, some of his seamen being on shore, met the host, and treated the procession with neglect and indignity. One of the

the Spanish priests resented this insult, fell upon them, and beat them severely. When they returned to their ship, they complained of this usage; upon which Blake sent to the viceroy demanding the surrender of the offending priest. The viceroy replied that he had no power over the priests; to which Blake returned for answer, that he would not enquire who had the power to deliver up the priest, but if he were not sent within three hours, he would burn their town. The viceroy sent the priest to Blake, who justified himself on account of the petulant behaviour of the seamen. Blake answered, that if complaint had been made to him, he would have inflicted just punishment, for he would not suffer his men to affront the established religion of any place, at which he touched; but he wished to have it known to the whole world, that an Englishman was only to be punished by an Englishman. He then treated the priest civilly, and sent him back. When Cromwell received this intelligence, he was highly delighted, and said he hoped that he should make the name of an Englishman as great as ever that of a Roman had been. It is said, that when Blake was cruising in the Mediterranean he met with a French ship of considerable force, and commanded the captain to come on board, no war having been declared between the French and English. The captain, being asked whether "he was willing to lay down his sword and yield," gallantly refused, though in his enemy's power. Blake, scorning to take the advantage of an artifice, and detesting the appearance of treachery, told him, "that he was at liberty to go back to his ship, and defend it as long as he could." The captain did so, and after an engagement of two hours, confessed himself conquered, kissed his sword and surrendered it. Mr. Granger, speaking of Blake's naval exploits, says, "that the very temerity of his enterprises struck terror into his enemies, and greatly contributed to his success. He not only improved the method of attack, but carried the naval power of Cromwell to a greater height than had been known in any age or nation." "Never man," says Mr. Hume, "so zealous for a faction, was so much respected and esteemed by the opposite factions." He was by principle an inflexible republican; and the late usurpations, amidst all the trust and caresses which he received from the ruling powers, were thought to be very little grateful to him. "It is still our duty," he said to the seamen, "to fight for our country, into whatever hands the government may fall." Disinterested, generous, liberal; ambitious only of true glory, dreadful only to his avowed enemies; he forms one of the most perfect characters of that age, and the least stained with those errors and violences, which were then so predominant. The Protector ordered him a pompous funeral at the public charge; but the tears of his countrymen were the most honourable panegyric on his memory. To the above testimonies we shall add the following lines from Mr. Glover's poem entitled "London."

——"Thy name
Was heard in thunder through th' affrighted shores
Of pale Iberia, of submissive Gaul,
And Tagus trembling to his utmost source.
O! ever faithful, vigilant, and brave,
Thou bold asserter of Britannia's fame,
Unconquerable Blake!"

Biog. Brit.

BLAKEA, in *Botany*, so named by Dr. Patrick Browne, from Mr. Martin Blake of Antigua, a great promoter of natural knowledge, and patron of the doctor's natural history of Jamaica. Lin. gen. 593. Reich. 647. Schreb. 810. Brown. t. 35. Juss. 328. Class and order, *Dodecandria Monogynia*. Gen. Char. *Cal.* perianth of the fruit inferior, six-leaved; leaflets ovate, concave, expanding, the size of the flower:—perianth of the flower superior; margin quite entire, hexangular, membranaceous. *Cor.* petals six, ovate, expanding, equal. *Stam.* filaments twelve, subulate, erect; anthers triangular, depressed, concatenated into a ring. *Pist.* germ inferior, obovate, crowned with the margin of the calyx, style subulate, the length of the flower; stigma acute. *Per.* capsule obovate, six-celled. *Seeds* very many.

Ess. Char. *Cal.* inferior, six-leaved; superior entire. *Pet.* six. *Caps.* six-celled, many-seeded.

Species, 1. B. *trinervia*. "Two-calycled; leaves nerveless, very finely striated acoss." Leaves oblong-ovate, petioled, quite entire, coriaceous, opposite; the three nerves underneath protuberant, blackish; flowers opposite, solitary. Generally rising to the height of 10 or 14 feet; one of the most beautiful productions of America; at first a climber, but gradually acquiring a more robust stem, which divides into many weak declining branches, well supplied on all sides with beautiful rosy blossoms. A native of Jamaica, in cool, moist, shady places. 2. B. *triplinervia*. "Uncalycled; leaves triple nerved." A tree growing to the height of 16 feet; leaves opposite, petioled, six or seven inches long, ribbed underneath, and having a nerve running along the edge; peduncles three-flowered; flowers distinct, without any lower perianth; upper perianth three or five-cleft, coriaceous, permanent; petals about seven; filaments twelve or fifteen; anthers ovate, parallel, flattish at the back, shorter than the corolla, truncated, not concatenated; style club-shaped; stigma capitate, streaked; fruit a roundish, many-celled berry, crowned with the calyx; seeds minute; fruit of a yellow colour, and sapid. A native of Surinam, where it was observed by Dalberg; also of Guiana, where it flowers and fruits in May.

Propagation and Culture.—These trees have not been yet cultivated in Europe. In the West Indies the first species thrives best on the sides of ponds or rivulets; and when planted in gardens, where its appearance is elegant, it ought to be supplied with some supports, whilst it continues young and weakly.

BLAKENEY, in *Geography*, a harbour on the coast of Norfolk, between Cromer at east by south, and Wells at west by north nearly, distant from the former 2 leagues, and from the latter 3 leagues.

BLAMONT, a town of France, and principal place of a district in the department of the Meurthe; containing 1863 inhabitants, and the population of the canton is 10,695. The territory comprehends 212½ kiliometres and 30 communes; 4½ leagues east of Luneville. N. lat. 48° 35′. E. long. 6° 44′.—Also, a town of France, in the department of the Doubs, and chief place of a canton; containing 400 persons, and the canton contains 3589; the territory comprehends 107½ kiliometres and 14 communes; 1½ league north of St. Hippolyte.

BLAMPIN, Thomas, in *Biography*, a Benedictine of St. Maur, was born at Noyon in Picardy in 1640, and taught philosophy and theology in his own congregation. He is chiefly known as editor of the works of St. Augustin, in which he displayed much critical erudition and sagacity, and great accuracy in his collation of MSS. Besides other preferments in the church, he was appointed in 1708 visitor of the province of Burgundy, and in consequence of the austerities exercised in this office, he died in 1710. Moreri.

BLANC. See Blank.

Blanc, Francis Le, in *Biography*, distinguished himself by the study of belles-lettres, history and medals, and was appointed by Louis XIV. to draw up an account of the monies

monies of France from the eſtabliſhment of the monarchy. Accordingly he publiſhed "A Treatiſe on the Monies of France," Paris, 1698. 4to. with figures; reprinted at Amſterdam, 4to. 1692. To this is uſually annexed his diſſertation, publiſhed the preceding year, "On the coins of Charlemagne and his ſucceſſors ſtruck at Rome." He was choſen hiſtorical tutor to the royal children; but died before he entered on his office, at Verſailles in 1698. Nouv. Dict. Hiſt.

Blanc, John Bernard Le, Abbe, hiſtoriographer of the public buildings, and member of the academies of La Cruſca, and of the Arcadi at Rome, was born at Dijon in 1707, and engaging in the literary career, wrote a tragedy entitled "Abenſaid," which, notwithſtanding the harſhneſs of its verification, was at firſt well received. At Paris, where he ſettled, he obtained friends and patrons; and in 1746 Maupertuis was empowered by the king of Pruſſia to offer him a reſidence, as a man of letters, at his court, which he declined accepting. His "Letters on the Engliſh nation," in 3 vols. 12mo. 1758, are the moſt known of his works, and were occaſioned by his viſit to England. The ſtyle is heavy, and the thoughts trite and vulgar, ſo that they are now little read. He died in 1781. Nouv. Dict. Hiſt.

Blanc, Lewis Le, *Sieur de Beaulieu*, a profeſſor of divinity at Sedan in the 17th century, was born at Pleſſis-Marli, where his father was miniſter, and in the progreſs of his life, of which few particulars are recorded, was diſtinguiſhed by his learning and virtue. He died in 1675, at the age of 60 years and 6 months. His "Theſes Theologicæ" were collected into one volume after his death, paſſed through ſeveral editions, and are highly worthy of an attentive peruſal. The firſt edition was printed at Sedan in 4to, and two other editions were printed in England; the third in 1683. He was eminent for the perſuaſive power of his eloquence, and diſcovered an uncommon degree of penetration and ſagacity in his writings and negociations. Anxious for a reconciliation and union between the Reformed and Romiſh churches, he paſſed in review many of the controverſies that divided them, and ſeemed to prove, with the utmoſt perſpicuity, that ſome of them were merely diſputes about words, and that the others were of much leſs conſequence than was generally imagined. This manner of ſtating the differences between the two churches drew upon him the indignation of thoſe who regarded all attempts to ſoften and modify controverted doctrines as dangerous and detrimental to the cauſe of truth. Among theſe we may reckon Arnauld, Saurin, and Jurieu. On the other hand, the acuteneſs and dexterity with which he treated this delicate ſubject, made a conſiderable impreſſion upon ſeveral perſons, and procured him diſciples who entertained his reconciling ſentiments, but either entirely concealed them, or diſcovered them with caution, as they were known to be diſpleaſing to the greateſt part of the members of both communions. Some of Le Blanc's ſermons were printed at Sedan in 1675. Gen. Dict art. *Beaulieu*. Moſh. Eccl. Hiſt. vol. v. p. 379.

Blanc, Lewis Le, a ſkilful ſurgeon and lithotomiſt of Orleans, publiſhed in 1764 "A Diſcourſe on the utility of Anatomy;" and in 1768, "Nouvelle Methode d'operer des Hernies," 8vo. He recommends dilating the ring with the finger, if practicable, which it uſually is, he ſays, in recent caſes; in thoſe of long ſtanding, with a pair of forceps he invented for the purpoſe, inſtead of uſing the knife. This doctrine having been oppoſed by Ant. Louis, he was anſwered by Le Blanc in a diſſertation on the ſubject, publiſhed in the fourth volume of the Memoirs of the Academy of Surgery. After reducing the inteſtine, by his method, no truſs is wanted, as is invariably the caſe when the ring is opened by inciſion. The forceps are introduced into the ring, cloſed, and open themſelves by the force of an elaſtic ſpring. He alſo wrote on the operation for the ſtone, on the method of extracting ſmall portions of the placenta left in the uterus, and further obſervations on the cure of hernia. Theſe papers were publiſhed in the 30th, 35th, and 39th volumes of the Journal de Medicine. In 1775 he publiſhed "Precis d'operations de Chirurgie," 2 vols. 8vo., containing the ſubſtance of the above, with ſome additional obſervations. Haller. Bib. Anat. de Chirurg.

Blanc-*manger*, Fr. q. d. *white food*, in *Domeſtic Economy*, is a preparation of diſſolved iſinglaſs, milk, ſugar, cinnamon, &c., boiled into a thick conſiſtence, and garniſhed for the table with blanched almonds. It is cooling and ſtrengthening.

Blancs *manteaux*, in *Eccleſiaſtical Hiſtory*, a name originally given to the *Servites*, or ſervants of the Bleſſed Virgin, on account of their white cloaks; but ſince applied to divers ſorts of religious, who have ſucceſſively inhabited the houſe of the *Servites*, and now to the Benedictines at Paris, though habited in black.

Blanc, *Mont*, in *Geography*, a lofty mountain of Savoy, in the duchy of Faucigny, being part of the ancient "Alpes Penninæ." See Alps. This is reckoned the moſt elevated mountain of the ancient continent, its height above the level of the ſea being, according to the calculations of M. de Luc, 15,304, Engliſh feet; or, according to the meaſurement of ſir George Shuckburgh, 15,662 feet. This accurate obſerver informs us (Phil. Tranſ. vol. lxvii. p. 595), that the height of Veſuvius, eſtimated by Sauſſure at 3900 feet, placed upon mount Ætna, elevated, according to ſir George, 10,954 feet, would not be equal to the height of Mont Blanc, which he ſuppoſes to be the moſt elevated point of Europe, Aſia, and Africa. This mountain, obſerved from the "Col de Balme," and the vale of "Chamouny," is particularly diſtinguiſhed from other mountains by a mantle of ſnow, which clothes its ſummit and ſides, almoſt without the intervention of the leaſt rock to break the glare of the "white" appearance, from which its name is derived. Thoſe who have ſeen it from the valley of Aoſt obſerve, that on that ſide it does not appear to be covered with a mantle of ſnow, and that it exceeds the Schreckhorn in ruggedneſs and horror. See Schreckhorn. "Thoſe who are totally unacquainted with Alpine ſcenes," ſays Mr. Coxe, (Swiſſ. vol. ii. p. 5.) "may, perhaps, conceive a faint idea of this gigantic mountain, on being informed, that the mantle of ſnow, which appears to cover its top and ſides, exceeds an altitude of 4000 feet perpendicular, and 9000 feet in an horizontal direction from the dôme of Gouté, to the ſummit; and that the height of the ſnow and ice, eſtimated from the ſource of the Arveron, at the bottom of the glacier of Montanvert, to the ſummit of Mont Blanc, cannot be leſs than 12,000 perpendicular feet, or near three times as high as Snowdon in North Wales. The higheſt point of this mountain appears like a compreſſed hemiſphere, and is called from its form "La Boſſe du Dromedaire;" from that point it gradually ſinks, preſenting a kind of concave ſurface of ſnow, in the midſt of which is a ſmall pyramid of ice; it then riſes into a ſecond hemiſphere, called by ſome "Little Mont Blanc," but, more properly, by others "Le Dôme du Milieu," or the "Middle Dôme;" thence it deſcends into another concave ſurface terminating in a point, indiſcriminately ſtyled by the natives "Aiguille de Gouté," "Point de Gouté," and "Dôme de Gouté;" from this dome it ends abruptly, and loſes itſelf amid the mountains that bound the vale of Chamouny. Five glaciers extend into this vale, and are ſeparated from one another by foreſts, corn-fields, and meadows; ſo that large tracts of ice are blended with cultivation, and perpetually ſucceed each other

other in the moſt ſingular and ſtriking viciſſitude. Theſe glaciers, which lie chiefly in the hollows of the mountains, and are ſome leagues in length, unite at the foot of Mont Blanc.

Of the various attempts that have been made to reach the ſummit of Mont Blanc, the firſt was that of M. Couteran, and three guides of Chamouny, Michael Paccard, Victor Taſſay, and Maria Coutet. On the 13th of July, 1776, they ſet off from the priory, about 11 in the evening; paſſed between the glaciers of Boſſon and Tacona; and after ſpending above 14 hours in mounting rugged and dangerous aſcents, and in croſſing ſeveral vallies of ice, and large plains of ſnow, found themſelves on the top next to Mont Blanc. But though at firſt ſight it appeared to be ſcarcely a league diſtant, they ſoon perceived that it ſeemed, on account of the clearneſs of the air, the whiteneſs of the ſnow, and its great height, to be much nearer than it really was, and that it would require at leaſt four hours more to reach the ſummit, even if it were practicable. As the day was far advanced, and the vapours near the ſummit of the mountain began to gather into clouds, they relinquiſhed their enterprize; and returned to Chamouny, not without perſonal danger in leaping over chaſms of ice, after a journey of 22 hours, with this ſatisfaction, that they had approached nearer to Mont Blanc than any former adventurers. The ſummit which they had attained is, according to ſir George Shuckburgh, more than 13,000 feet above the Mediterranean. After ſome ſubſequent but unſucceſsful attempts, M. Bourrit, accompanied by ſix guides, departed from Bionaſay, and began to "ſcale (as he terms it) the rampart" of Mont Blanc, when he ſuddenly found himſelf ſo exceedingly affected by the intenſe cold that he was unable to proceed. Maria Coutet, and Francis Guidet, two of his guides, proceeded to the dome of Gouté, which is about 9400 feet in an horizontal direction from the ſummit; but the approach of night obliged them to return. On the 4th of September 1785, Maria Coutet and James Balmat advanced beyond the dome of Gouté, towards the ſummit, but a violent ſtorm of hail and wind compelled them to abandon the enterprize. On the 13th of this month Meſſrs. Sauſſure and Bourrit, attended by twelve guides, well provided with barometers, thermometers, and other neceſſary inſtruments, left Bionaſay, and arrived at a hut, which was conſtructed by their orders, at "Pierre Ronde," 7808 feet above the level of the ſea; and on the next morning they purſued their journey to the dome of Gouté; but a heavy fall of ſnow prevented their progreſs. Sauſſure ſays, that the mercury in the barometer ſunk 18½ inches, and that he reached an elevation of 8256 Engliſh feet. In July 1786, James Balmat, one of ſix guides of Chamouny, being ſeparated from his companions, who failed in another attempt, paſſed the night on a ſpot above the "Dome of Gouté," elevated more than 12,000 feet above the level of the ſea. On his return, however, to Chamouny, he was ſeized with a very ſevere indiſpoſition, the effect of extreme fatigue, and of the intenſe cold; but being attended by Dr. Paccard, a phyſician of the place, he offered, as an expreſſion of gratitude for his attendance, to conduct him to the ſummit of Mont Blanc. Accordingly, on the 7th of Auguſt, theſe two daring adventurers ſallied forth from Chamouny, and reached the mountain of "La Côte," which overhangs the upper part of the glacier of Boſſon. Here they paſſed the night, and at three on the next morning they purſued their route over the ice, aſcended the "Dôme of Gouté," paſſed under the "Middle-Dôme," and turning to the eaſt, at the laſt pyramid of rock, continued along the ridge which is ſeen from Geneva, and which lies on the left of the ſummit. Here cold and fatigue diſcouraged Dr. Paccard; but being animated by his companion, he determined to advance, ſtruggling with a very violent and piercing wind, till at length they attained the ſummit which no one had viſited before. Here they remained about half an hour, when they found the cold ſo intenſe, that their proviſion was frozen in their pockets, the ink congealed in their inkhorns, and the mercury in Fahrenheit's thermometer ſunk to 18½ degrees. They ſpent 15 hours in aſcending; but found great difficulty in their deſcent, their ſight being much debilitated by the reflection of the ſnow. On their return to Chamouny at eight in the morning, their faces were excoriated, their lips much ſwelled, and Dr. Paccard was almoſt blind. Theſe adventurers prepared the way for the obſervations and diſcoveries of future naturaliſts, and particularly of Sauſſure, whoſe indefatigable zeal would not allow him to reſt, till he had reached the top of Mont Blanc, and made thoſe experiments, which have ſerved in a very conſiderable degree to elucidate the theory of the atmoſphere.

Having arrived at Chamouny, a village at the baſe of the mountain, M. de Sauſſure was detained by continual rains for four weeks; after which, he ſet out on the 1ſt of Auguſt 1787, accompanied by a ſervant and 18 guides, who carried the philoſophical inſtruments and the tents, and other apparatus neceſſary for the intended experiments. Although the diſtance from the priory of Chamouny to the ſummit of the mountain is little more than two leagues, or about 6¾ miles, in a ſtraight line, it requires nevertheleſs 18 hours to gain the ſummit, on account of the difficulties of the road, as well as the neceſſary circuits. In the evening, they arrived at a hut conſtructed for them on the top of the mountain of "La Côte," about a mile perpendicularly above the village. Their ſecond day's journey was attended with many difficulties, owing to the wide, deep, and irregular chaſms interſecting the ice-valley on the ſide of the hill, which can only be croſſed by means of bridges naturally formed of ſnow, and often very ſlender; extended, as it were, over an abyſs. In this perilous valley, they were obliged to purſue a winding road, ſo that they were three hours in croſſing it, though in a ſtraight line its breadth is not above three-quarters of a mile. At length, however, they reached the chain of rocks that border on the perpetual ſnows which cover Mont Blanc, and then mounted, in a ſerpentine direction, to a valley filled with ſnow, and running from north to ſouth, to the foot of the higheſt pinnacle. The ſurface of the ſnow in this valley has numerous fiſſures; penetrating to a great depth, and conſiderably broad; preſenting to view, by their broken ſides, the ſucceſſive horizontal layers of ſnow, which are annually formed. In this ſituation the guides wiſhed to paſs the night; but Sauſſure, obſerving that the loftieſt of theſe rocks is at leaſt 1400 yards perpendicularly lower than the ſummit of the mountain, wiſhed to proceed, and at length prevailed with the guides to accompany him. At four in the afternoon, they arrived at the ſecond of the three plains of ſnow, which they had to paſs; but as the day was far advanced, and they were apprehenſive of expoſing themſelves to the "Avalanches," which are frequently tumbling from the ſummit of the mountain, they determined to proceed no farther. Here they encamped at the height of 9312 feet above the priory of Chamouny, or 12,762 feet above the level of the ſea. For this purpoſe, they dug a deep hole in the ſnow, of ſufficient width to contain the whole company, and covered its top with the tent-cloth. In this ſituation the barometer had fallen to 17 inches, 10 lines $\frac{9}{32}$; and they all felt the effects of the rarefied air. Seven or eight hours' walk, which they had juſt performed, had not in the leaſt affected theſe robuſt and hardy men; but they had ſcarcely raiſed five or ſix ſhovels of ſnow, in forming their intended habitation, before they were under a neceſſity of

of desisting from labour, and of taking breath at very short intervals. M. de Saussure himself, though accustomed to the atmosphere of mountains, and finding himself, as he says, much better in it than in the air of plains, now felt exhausted with fatigue, only by observing his meteorological instruments. This uncomfortable sensation was heightened by an acute thirst, and water could not be procured, except by melting snow; for the water which they had seen during their ascent, would by this time be congealed; and the small chafing-dish which they had taken with them, very slowly supplied 20 people languishing with thirst. From the middle of this snowy plain, not far below the top of Mont Blanc, the snow exhibited the most dazzling brightness, and formed a singular contrast with the sky, which, in these elevated regions, appears almost black. No living creature was seen here, nor the least trace of vegetation. The moon shone with the brightest splendour in the midst of a sky as black as ebony. Jupiter, rayed like the sun, arose from behind the mountain in the east; and the light of these luminaries was reflected from the white plain, or rather bason, in which they were situated, and by their dazzling lustre, eclipsed every star, except those of the first and second magnitude. Whilst they were composing themselves to sleep within their tent, incommoded by heat and vitiated air, they were soon alarmed by the noise of an immense mass of snow, or "Avalanche," which fell from the top of the mountain, and covered part of the slope over which they were to climb the next day. The next morning they departed at seven for the third and last plain; turning to the left in their way to the highest rock, which is on the east part of the summit, they found the ascent in some places so steep, that the guides were obliged to hew out their footsteps with hatchets. Their progress was slow, and it took them two hours to climb a hill about 1590 feet high. Having arrived at this last rock, they turned to the west, and climbed the last ascent, about 900 feet high, and inclining about 28 or 29 degrees. Here the air was so rarefied, that Saussure could not take 15 or 16 steps without stopping for breath; and at intervals he found himself faint, so that he was under the necessity of sitting down, until, with the return of respiration, his strength was revived. On his arrival to the summit, at 11 o'clock, a slight vapour, suspended in the inferior regions of the air, prevented him from beholding the lower and more distant objects; such as the plains of France and Lombardy; but he had the less reason for regretting this loss, as he was agreeably surprised by a most distinct and comprehensive view of all those elevated summits, with the organization of which he had so long desired to be acquainted. He thought himself dreaming, when he saw beneath his feet many majestic peaks, especially "Aiguilles," "Le Midi," "l'Argentiere," and "Le Géant," the bases of which he had found it so difficult to ascend. He seized in his mind their mutual proportion and connection, their form and structure; and a single glance removed doubts, and afforded information much more satisfactorily, than whole years of previous study. During this time, his guides pitched his tent, and made preparations for his experiments; but in attempting to dispose his instruments for this purpose, he was obliged, almost at every instant, to desist, and wholly to occupy himself about the means of respiration. Considering that the barometer stood at only 16 inches, 1 line, or 17.145 inches English, and that the air, consequently, possessed little more than half the density of that on the plains, it is manifest that the deficiency was to be supplied by more frequent inspirations. This frequency, of course, accelerated the circulation of the blood, more especially as the arteries, on the surface of the body, were no longer actuated from without by the pressure which they usually experience. When M. de Saussure remained perfectly quiet, he only felt rather uncomfortable, with a slight disposition to be sick; but in any exertion, or when he fixed his attention for a few successive moments, and particularly when, by stooping, he compressed his chest, the necessity recurred of resting himself, and respiring for two or three minutes. His guides also experienced similar sensations. They felt no appetite, and had no inclination to take wine or brandy, having found that strong liquors increased the above indisposition; without doubt, by quickening the circulation of the blood. Nothing but fresh water was coveted and relished, and yet both time and exertion were required to light the fire, without which it was impossible to obtain any. In this situation Saussure and his companions continued $4\frac{1}{2}$ hours, and in their descent they found fewer difficulties than they expected. They arrived the next morning at the valley of Chamouny, without the least accident; and as they had taken the precaution to wear veils of crape, their faces were not excoriated, nor their sight debilitated.

M. de Saussure has given an ample detail of his observations on the summit of Mont Blanc, in the 4th volume of his "Voyages dans les Alpes;" and a translation of this account by professor Martyn, of Cambridge, forms an appendix to his sketch of a tour through Switzerland. We shall here select a few particulars. We learn from this narrative, that the summit of the mountain is a ridge, nearly horizontal, lying east and west; the slope at each extremity inclining from 28 to 30 degrees, the south side between 15 and 20, and the north about 45 or 50. This ridge is so narrow as scarcely to allow two people to walk abreast, especially at the west end, where it resembles the roof of a house; it is wholly covered with snow; nor is any bare rock to be seen within 150 yards of the top. The surface of the snow is scaly, and in some places covered with an icy crust, under which the snow is dusty, and without consistence. The highest rocks are all granites; those on the east side are mixed with steatites; those on the south and west contain a large quantity of schoerl, and a little lapis corneus. Some of them, especially those on the east, which are about 150 yards below the summit, seem to have been lately shivered with lightning. M. de Saussure saw no animal on the mountain, except two flies, a grey phalæna, and a "Myrtillus," which he supposes must have been driven there by the wind. At the elevation of 11,392 feet above the sea, he observed the "Silene Acaulis," or moss campion, in flower; and still higher, on the most elevated rocks, the "Lichen Sulphureus," and "Lichen Rupestris" of Hoffman. He has given us the height of the barometer on the top of the mountain: *viz.* Aug. 3. at noon, 16 inches 0 line, and $\frac{144}{168}$ of a line, French measure, *i. e.* 16.181 English; and Reaumur's thermometer was 2.3 below the freezing point, or 27 of Fahrenheit. M. Sennebier, at the same time, observed, at Geneva, the barometer 27 inches 2 $\frac{1885}{1000}$ lines, or 29.020 inches English, and the thermometer 22.6 above freezing, or 82 of Fahrenheit. From these data he makes the height of Mont Blanc 2218 toises, or 14,180 English feet, according to M. de Luc's rule, and 2272 toises, or 14,525 English feet, according to M. Trembley's. To these heights 13 toises, or 83 feet, the height of M. Sennebier's room above the lake of Geneva, must be added, to give the height of the mountain above the level of the lake 14,263 feet, according to M. de Luc, and 14,608 feet, according to M. Trembley. Sir George Shuckburgh made the height of Mont Blanc, by trigonometrical measurement, 14,429 feet above the lake, which is almost the mean between the other two. The result of the observations made at Chamouny, cotemporary with those on Mont Blanc, agrees still more nearly with sir George's measurement. The general mean result makes the summit of Mont

Blanc 2450 toiſes, or 15,673 Engliſh feet, or nearly three Engliſh miles above the level of the ſea. By M. de Sauſſure's experiments with the hygrometer, the air on the top of Mont Blanc contained ſix times leſs humidity than that of Geneva, and to the extreme dryneſs of it he attributes the burning thirſt which he and his companions experienced. But the reſult of his experiments ſeems very different from the ſyſtem of meteorology publiſhed by M. de Luc. See HYGROMETER. It requires half an hour to boil water on the top of this mountain; whereas 15 or 16 minutes are ſufficient at Geneva, and 14 or 15 by the ſea-ſide. Water boiled at 68.993 degrees of a thermometer, which riſes to 80 with the barometer 27 French inches high. By experiments with the electrometer, M. de Sauſſure found, that the electricity of the air on the ſummit of the mountain was poſitive. The wind on the ſummit was north, and very piercing; but ſouthward of the ridge the temperature of the air was agreeable. The experiments with lime-water, and with the cauſtic alkali, ſhewed that the air was mixed with atmoſpheric acid, or fixed air.

The difficulty of reſpiration, experienced by M. de Sauſſure and his companions, has been aſcribed by ſome to fatigue, and not to the rarefaction of the air; but his obſervations prove, that the latter was the cauſe both of the difficulty of breathing and the quickneſs of the pulſe. This, indeed, was ſo conſiderable, that the pulſe of one of the guides, after continuing four hours on the ſummit, was 98, of the ſervant 112, and of M. de Sauſſure himſelf 100 in a minute; whereas at Chamouny they were 49, 60, and 72 reſpectively. M. de Sauſſure's obſervations confute an opinion, which is very common, with reſpect to the change of the ſenſes of ſmelling and taſte ſuppoſed to take place on high mountains. He tried the experiment on different mountains, and both the taſte and ſmell of bread, wine, meat, and fruit, appeared to him and to his attendants not at all different. As to ſound becoming weaker, this circumſtance is not to be attributed to any impaired ſtate of the organ of hearing, but to the rarefied air, which both reſiſts leſs and vibrates leſs. Beſides, on an inſulated ſummit there are no echoes nor ſolid objects to repel the ſound. Theſe concurring cauſes rendered the ſounds on the top of Mont Blanc remarkably feeble; the report of a diſcharged piſtol being equal in ſtrength only to that of a ſmall Chineſe cracker let off in a room.

Soon after M. de Sauſſure's expedition, Mr. Beaufoy, an Engliſh gentleman, ſucceeded in an attempt to aſcend Mont Blanc; but it was attended with peculiar difficulty, ariſing from the enlargement of the chaſms in the ice. An account of this enterpriſe was communicated to the Royal Society in 1787.

BLANC, *Mont*, gives denomination to a department formed of Savoy. It is bounded on the north by the departments of Leman and of Ain; on the eaſt by Piedmont; on the ſouth by Piedmont and the departments of Upper Alps and of Iſere; and on the weſt by thoſe of Iſere and of Ain. Its ſuperficies is about 1,254,796 ſquare acres, or 640,427 hectares; and its population about 283,106 individuals. It is divided into four communal diſtricts; *viz.* Chambery, its capital, Annecy, Moutiers, and St. Jean de Maurienne.

BLANC-*en-Berry*, *Le*, a town of France, and principal place of a diſtrict, in the department of the Indre, containing 3850 inhabitants. The population of the canton amounts to 10,602; and its territory comprehends 387½ kiliometres and 10 communes; ſix leagues W. of Argenton.

BLANC-*Courſier Herald*, created by patent on the revival of the moſt honourable military order of the Bath, 1725, "to attend the firſt and principal companion of the order for the time being." He enjoys all rights, privileges, and immunities as any other herald; and his office is annexed, united, and perpetually conſolidated with the office of genealogiſt of the ſaid order. See GENEALOGIST *of the Bath*.

BLANCA, in *Geography*, a ſmall iſland in the Weſt Indies, north of Margarita, in the province of Andaluſia, low and uninhabited; having ſavannahs of long graſs, plenty of guanas, and ſome trees of lignum vitæ; but chiefly remarkable for its turtle fiſhery. N. lat. 11° 20′. W. long. 64° 10′.

BLANCA, or BLANCHE, an iſland in the gulph of Mexico, near the coaſt. N. lat. 25°. W. long. 62° 14′.—Alſo, a river in the province of Chiapa, in the Audience of Mexico, in New Spain. Its water, though clear, is ſaid to have a petrifying quality.

BLANCARD, STEPHEN, in *Biography*, was ſon of Nicholas Blancard of Leyden, by whom he was initiated into the knowledge of philoſophy and medicine. At a proper age he went to Breda, and thence to Franeker, where he took his degree of doctor in medicine about the year 1678. We ſoon after find him ſettled at Amſterdam, where he dedicated his time to the practice of his art, but principally to writing or compiling a great variety of anatomical and medical works, of which the moſt valuable, Haller ſays, is his "Anatomia practica rationalis, ſ. variorum cadaverum morbis denatorum anatomica inſpectio," publiſhed 1688, 12mo. But he has, even in this work, introduced many obſervations taken from other writers, without acknowledging it. The caſes here deſcribed are 200 in number, and, in general, curious and deſerving notice. Geolicke, however, not only accuſes him of plagiariſm, and of mutilating and ſpoiling the obſervations taken from other anatomiſts, but he blames him for publiſhing ſo many of his works in the Dutch, his native language, which cannot fail, in the end, he ſays, of being highly injurious to the profeſſion of medicine, by enabling perſons to practiſe who have not previouſly received a liberal education. This is, however, now done pretty generally all over Europe, and neceſſarily at the leaſt in this country, where there are ſo many perſons practiſing in every branch of medicine who are incapable of reading any other language than their own, the law here authorizing any perſons who may chuſe it to practiſe medicine, without examination, excepting phyſicians and ſurgeons reſiding in the neighbourhood of London, or of the two univerſities. We ſhall only mention one other of this writer's multifarious productions, his "Lexicon Medicum," containing explanations of all the terms uſed in medicine, ſurgery, and anatomy, firſt publiſhed in 1679, 8vo. This has paſſed through numerous editions, and lately, in 1777, by the care of Jac. Fred. Ilmſham, is increaſed to nearly treble its original bulk, making two large volumes, 8vo.

Blancard's works were collected and publiſhed at Leyden, under the title of "Opera omnia theoretica et practica," in 1 vol. 4to. 1701. Haller Bib. Med. Chirurg. Anat. Botan. Eloy. Dict. Hiſt.

BLANCARDS, a name given to certain linen cloths thus called, becauſe the thread uſed to weave them, has been half-blanched or bleached before it was uſed. They are manufactured in Normandy, particularly in the places which are in the diſtrict, or under the juriſdiction of Pont-Audemer, Bernay, and Liſieux.

BLANCAT, ST. in *Geography*, a town of France, in the department of the Upper Garonne; 4 leagues W.N.W. of St. Gaudens.

BLANCH, a cape on the French coaſt, N. W. of Calais, almoſt oppoſite to Dover, on the Engliſh coaſt.

BLANCH, or *White Iſland*, one of the large iſlands on the coaſt of France, lying along the ſhore of the projecting coaſt to the N. E. of Morlaix.

BLANCH *fermé*, or BLANK *farm*, in *Law*, a *white farm*, that is, where the rent was to be paid in ſilver, not in cattle.

In

In ancient times, the crown-rents were many times reserved to be paid in "libris albis" called *blanche fermes:* in which case the buyer was holden *dealbare firmam;* viz. his base money or coin, worse than standard, was melted down in the exchequer, and reduced to the fineness of standard silver; or instead thereof he paid to the king 12d. in the pound, by way of addition. In Scotland, this kind of small payment is called "blanch holding," or "reditus albæ firmæ."

Blanch-*Lyon Pursuivant of Arms.* This officer took his title from the arms and supporters of the Mowbrays', dukes of Norfolk (being ruby, a lion rampant, pearl.) Thomas Howard, duke of Norfolk, instituted the office of blanch-lyon pursuivant 29 Hen. VIII. and he attended at the funeral of queen Jane. Blanch-lyon was also a name to an officer of the crown in the reign of Edward IV.

Blanch-*Rose Pursuivant of Arms,* was a pursuivant created by Edward IV. and so denominated from the distinguished badge of the house of York.

Blanch-*Sanglier Pursuivant of Arms.* This office was instituted by Richard duke of Gloucester during the reign of his brother Edward IV. in allusion to his badge or cognizance being a white boar.

BLANCHARD, William, in *Biography,* an advocate in the parliament of Paris, was admitted to the bar in 1674, and much employed. Notwithstanding his professional labour, he found leisure for literary researches, and in 1687, published a chronological table of the ordinances of the French kings of the third race; which was republished, with improvements, under the title of "A Chronological Compilation, containing a collection of the ordinances, edicts, declarations, and letters patent of the kings of France, relative to public justice, police, and the finances, from the year 987 to the present time," 2 vols. fol. 1715. The work abounds with accurate researches; and a supplement to it was preparing by the author, when he died in 1724. Moreri.

Blanchard, Jaques or James, a painter of history and portrait, was born at Paris in 1600, and having been instructed in the first principles of painting in his own country, he travelled into Italy, where he studied for some time at Rome and Venice, and acquired, from particular attention to the works of Titian and of the Venetian school, distinguished excellence in the art of colouring, so as to have obtained the flattering appellation of the "French Titian." He was employed a considerable time at Turin by the dukes of Savoy, and afterwards painted several pieces at Lyons. Upon his return to Paris he was much engaged, and by his descent of the Holy Spirit, and a St. Andrew kneeling, gained high reputation. Colouring was his peculiar excellence, and he was distinguished for his judicious management of lights and shades. His principal works, besides those already mentioned, are a gallery at the hotêl de Bouillon, of subjects from the heathen mythology, and the bacchanals in the saloon of M. Morin, with some pieces at Versailles and Trianon. To Blanchard is ascribed the good taste for colouring which obtained in France. He is said to have etched several plates from his own compositions. He died at Paris in 1658, and left a son *Gabriel,* who was also a painter of eminence. D'Argenville. Strutt. Pilkington.

BLANCHE, in *Ornithology.* Sonnini describes a kind of *tern,* or *hirondelle de mer,* under this name, in his additions to Buffon's History of Birds. The plumage is entirely white; with the legs and bill black. It inhabits the Cape of Good Hope, and may be placed in the Indian and southern seas. Latham calls this bird *sterna alba.*

Blanche-*Carte.* See Carte.

Blanche-*Coiffe,* or Blanche-*Coïffe,* in *Ornithology,* is the *corvus cayanus* of Gmelin and Latham, in Buffon's History of Birds. It is likewise called in the same work *geay de Cayenne,* and by Latham the *Cayenne jay.*

Blanche-*Raie,* synonymous with *etourneau des terres magellaniques,* names given in Buffon's History of Birds to the Linnæan *sturnus militaris,* a native of Falkland island.

Blanche, Fr. for a minim, in *Music,* or a white note with a tail to it. See Musical *Characters,* and Time-table.

BLANCHERS, a name given to mechanics employed in blanching, i. e. the art or manner of bleaching or whitening.

BLANCHET, Thomas, in *Biography,* a painter of history, perspective, and portrait, was born at Paris in 1617, and first manifested a genius for sculpture; but on account of the weakness of his constitution he was advised to direct his attention to painting. Accordingly, having practised for some time at Paris, he travelled for further improvement into Italy. By the counsel and assistance of Poussin and Andrea Sacchi, he applied to history painting; and on his return to Paris, he painted several pieces, particularly a picture at Notre Dame, much admired. At Lyons, where he afterwards settled, he became director of an academical school. During his absence from Paris, he was admitted, in 1676, into the academy of painting. Blanchet designed well, and understood the principles of perspective and architecture. His composition was rich, and his colouring natural; and though he was not always correct, his deficiency in this respect is imputed more to the fire of his genius and the rapidity of his execution, than to want of skill. His master-piece was the cieling of the great hall in the hotêl de ville at Lyons, which was unfortunately consumed by fire; and the accident is said to have affected him so deeply, as nearly to have cost him his life. The magistrates of Lyons rewarded him with a pension, and with apartments in the hotêl de ville. His character was amiable, and his conversation lively and interesting, so that his company was much sought and valued. He died at Lyons in 1689. Some few of his pieces have been engraved. D'Argenville. Pilkington.

Blanchet, in *Ichthyology,* the familiar French name of a sort of salmon that inhabits the American seas; *salmo fœtens* of Linnæus.

Blanchet, in *Zoology, l'Amphisbène blanchet,* a kind of amphisbæna known among the French naturalists of the present day by this name. The species is described as being of a white colour, without any spots; the body as consisting of 230 annulations, and the tail of 16: on the head are six large scales, and about the vent eight very small tubercles. The length is 18 inches, exclusive of the tail, which measures an inch and an half. This is a native of South America, where it feeds on ants and other insects.—Bosc, from whom the above detail is copied, we are convinced, can mean no other than the *amphisbæna alba* of Linnæus, when he describes this species. The Linnæan character states the number of rings on the body of this kind at 223, in which particular alone the two descriptions seem to be at variance; and the inconstancy of that character is too well known to justify the opinion of their being distinct, for that reason only.

BLANCHING, in *Gardening,* is the art of rendering the leaves and stems of various sorts of plants, as endive (cichorium), celery (apium), &c. white, tender, and esculent. It consists in producing a kind of vegetable debility or disease, by depriving them of the stimulant effects or influence of light, and is accomplished either by earthing them well up, or completely covering them, when perfectly dry, by boards, tiles, or other similar means, as will be more fully

fully explained in treating of the different plants that require this sort of management.

Blanching also denotes the operation of covering iron plates with a thin coat or crust of tin. See Latten.

Blanching *of copper* for sale, in imitation of silver; or mixing blanched copper with silver, or exposing the same to sale; or any malleable composition or mixture of metals, or minerals heavier than silver, and which looks, and touches, and wears like gold, but is manifestly worse than standard, is made felony, 8 and 9 W. III. &c. 26.

Blanching *of wax*. See Wax.

Blanching, in *Coinage*, the operation of preparing the pieces before striking, to give them the requisite lustre and brightness.

The blanching, as now practised, is performed by nealing or heating the pieces in a kind of pan or shovel, with a wood-fire, in manner of a reverberatory furnace, so that the flame passes over the shovel. The pieces being sufficiently heated, and cooled again, are put successively to boil in two copper pans, wherein are aqua fortis, common salt, and tartar of Montpellier; when they have been well-drained of this first water in a copper sieve, they throw sand and fresh water over them; and when dry, they are all well rubbed.

The ancient method of blanching was, by putting the pieces, after heating, in a large vessel of common water; and some ounces of aqua fortis, but in different proportions for gold and silver.—The method is now disused, partly by reason of its expensiveness, and partly because it diminishes the weight of the metal.

BLANC-JAUNE, in *Ichthyology*. *Salmo niloticus*, of Linnæus, a fish of the salmon tribe found in the Nile, is called blanc-jaune by some French authors.

BLANCKAMERE, in *Geography*, a town of Brabant, 2 miles S. of Breda.

BLANCKENBERG, Blankenburg, or Blakenberg, a town of Germany, in the circle of Upper Saxony, and county of Schwartzburg-Rudolstadt, seated on the Rinne, 4 miles S.W. of Rudolstadt.

BLANC-NEZ, in *Zoology*. Under this name the Linnæan *Simia petaurista* is described, both in Buffon's Natural History, by M. Allamand, and Sonnini, and in the history of Apes, published recently in Paris by Audebert. The pervading colour of this animal is a very dark olive; the visage is black, with the exception of the nose, a remarkable snowy white spot of a triangular form being situated on the latter, which gives the creature a very singular appearance. The appellation of *blanc-nez* or *Guenon blanc-nez*, is very well applied, and might be rendered into English with much propriety, the white-nose monkey, if that name had not been previously assigned to another species by Mr. Pennant and Dr. Shaw. In the Zoology of the last writer we are informed, that the distinguishing character of his white-nose monkey (*Simia nictitans*, Linn.) is the tip of the nose, which is milk-white, while the face itself is black. Dr. Shaw observes, however, shortly after, that the white-nose, in this species, is not absolutely peculiar, but is found in another; alluding, as we imagine, to his vauiting monkey, which answers to that description. The last mentioned animal he considers as the *Simia petaurista* of Linnæus, and *blanc-nez* of Allamand's edition of Buffon's quadrupeds, as Gmelin states them; and so far the countenance of the French naturalists appears in favour of his opinion. But, perhaps, it will admit of some doubt how far we may be authorised in believing still further with Dr. Shaw, that the *Guenon blanc-nez* of Allamand, and Sonnini, in Buffon's Natural History, and *Guenon à nez blanc proéminent* of the Supplement of that work, are of the same species. Dr. Shaw thinks the first of these must be the female, and the other the male. Virey, and likewise Audebert, are persuaded that they are certainly distinct species. *Guenon blanc-nez*, they consider as the Linnæan; *Simia petaurista*, and *Guenon à nez blanc proéminent*, as *Simia nictitans* of the same author.

BLANCO, in *Geography*, the name of a cape of Africa, on the north coast of the kingdom of Tunis, called the "White Promontory," or, with the same meaning by the inhabitants, "Ras-el-abead;" and supposed to be the "Promontorium candidum" of Pliny; and the "Promontorium pulchrum" of Livy, where Scipio landed in his first African expedition. N. lat. 37° 9′. E. long. 10° 18′.—Also, a small point to S. E. of cape Corso, in the island of Corsica.—Also, a cape on the western coast of Africa, in Negro-land; first discovered by the Portuguese in the year 1441. N. lat. 20° 55′ 30″. W. long. 17° 10′. high water 9ʰ 45′.—Also, a cape on the western coast of the territory of Tschesmé in Asiatic Turkey, opposite to the southern point of the island of Scio. N. lat. 38° 20′. E. long. 25° 9′.—Also, a cape of South America, on the coast of Brazil, between cape Roque on the north, and cape St. Augustine on the south. S. lat. 6° 50′. W. long. 35° 33′.—Also, a cape of South America, on the eastern coast of Patagonia, north of port Deseado. S. lat. 47° 20′. W. long. 64° 42′.—Also, the north-western point of the bay of Salinas, on the coast of Nicaragua, N. W. from Panama-bay. N. lat. 9° 20′. W. long. 85° 48′.—Also, a cape on the north-west coast of America in New Albion, southward of the mouth of the river called "the river of the west," between cape Gregory and point St. George, and at a further distance between cape Foulweather and Mendocino. N. lat. 43° 20′. W. long. 128° 20′.—Also, a promontory of Peru, in South America, on the coast of the South sea, 120 miles S. W. of Guayaquil. S. lat. 3° 45′. W. long. 83°.

Blanco, an island on the south-eastern part of the peninsula of Yucatan in New Spain. N. lat. 21°. W. long. 88° 5′. See Blanca.

BLANDA, in *Entomology*, a species of Buprestis, that inhabits South America. The wing-cases are attenuated, serrated, and furrowed; colour brassy-green, with the furrows coppery. Fabricius.

Blanda, a species of Tenthredo, found in England. The colour is black; abdomen rufous in the middle; posterior thighs marked with a white spot. Fabricius, &c.

Blanda, in *Ancient Geography*, a town of Hispania Tarragonensis, mentioned by Mela, Ptolemy, and Pliny, situate on the coast of the Laletani, south of Garunda.—Also, a town of Italy, in the country of the Brutii, according to Pliny and Mela, but called "Blandæ," by Livy, and placed by him in Lucania.

BLANDFORD, commonly called *Blandford forum*, in *Geography*, is a market town of Dorsetshire, England. It is seated on the eastern banks of the Stour, and on the great post road from London to Exeter, Cornwall, &c. In the Domesday book no less than nine parcels or parishes are included under the name of Blencford or Blancford, of which this is the most considerable, and was styled a borough in some ancient records, though it does not appear to have been represented in parliament more than twice; once in the reign of Edward I. and again during the reign of Edward III. James the first granted it a charter, and made it a free borough with certain corporate privileges and immunities. The town is governed by a bailiff and six capital burgesses; a part of whom is invested with the power of determining suits not exceeding 10l.

Here is a small manufactory of shirt and waistcoat buttons, and another of thread, but the principal trade of the town depends upon its neighbourhood, and the passage of travellers. The town has been destroyed several times by fire.

In Camden's time it was mostly burnt by accident, but was soon rebuilt in an improved manner. The years 1676, 1713, and 1731 are recorded as peculiarly calamitous to this town, and in the latter year nearly the whole of it was destroyed. The church, town-hall, alms-house, free-school, and all the houses, but forty, were consumed. Many lives were lost, and the distressing calamity was greatly augmented by the small-pox, which raged in above sixty families. The computed damage was valued at 100,000l. but the distress, terror, and misery that prevailed at the time, and resulted from the direful catastrophe, far exceed all calculation, and defy the powers of verbal description. The town has since been rebuilt, and its appearance much improved by some respectable houses, a new church, town-hall, &c. The latter is a neat building composed with Portland stone, and constructed on columns of the Doric order. Within the building is a pump which was erected by John Bullard, who having been a considerable sufferer by the last fire, had this pump constructed to supply the town with water, and thereby to prevent another similar disaster. The new church, built in the Grecian style of architecture, consists of a body, two aisles, a chancel, and a tower. Its interior is very neatly ornamented, and contains several handsome marble monuments.

The charitable donations to Blandford are numerous and valuable, and are appropriated to endow an alms-house, to apprentice and clothe poor boys, to erect and support a charity school, two free-schools, and for other benevolent purposes. Blandford is 104 miles W.S.W. from London, and contains 408 houses, with 2326 inhabitants: at the east end of the town are the remains of a handsome old building, called "Damory court," which has been possessed by many noble and distinguished personages.

Blandford is the birth-place of many celebrated characters: among whom the following are the most distinguished: *George Ryves*, who was warden of New College, Oxford, in 1599, and vice-chancellor, in 1601; *Bruno Ryves*, author of the Mercurius Rusticus, a singular book, recording many of the events of the civil wars. He also assisted in publishing the Polyglot Bible, was dean of Chichester and Windsor, and died at the latter place in 1677, aged 81 years; *William Wake*, archbishop of Canterbury, &c. was born here in the year 1657, and died at Lambeth in 1736; *Thomas Creech*, the translator of Lucretius, and other ancient classic authors, was born here in 1659; *Christopher Pitt*, another translator, dates his birth at Blandford, where he was buried in 1748.

About one mile south of Blandford-forum is Blandford St. Mary, a village noted in the annals of literature as the birth-place of Browne Willis, the celebrated antiquary and topographer (see Willis). At the distance of one mile west of this town is Brianstone-house, the elegant and commodious mansion of Edward Berkeley Portman, esq. This house was erected from the designs of James Wyatt, who has displayed much judgment and taste in the disposition of the apartments, the arrangement of the offices, and in the two principal façades. The river Stour winding in a broad sheet through the grounds, with the plantations and distant scenes, combine to render this a charming and delightful residence. Hutchins's History of Dorsetshire, second edition, fol. 1796.

Blandford, a township of America, in Lunenburgh county in Mahon bay, Nova Scotia, settled by a few families.—Also, a township in Hampshire county, Massachusetts, west of Connecticut river; about 25 miles S.W. of Northampton, and 116 W. of Boston; containing 1778 inhabitants.—Also, a town in Prince George county, Virginia, about 4 miles N.E. from Petersburgh, and within its jurisdiction. It contains 200 houses, and 1200 inhabitants, and is pleasantly situated on a plain, on the eastern branch of Appamattox river. Here are many large stores, and three tobacco warehouses, which receive annually 6 or 7000 hogsheads. It is a thriving place; and as the marshes in its vicinity are drained, the air of this town, and also that of Petersburgh, [illegible]

Blandina, in *Entomology*, one of the Fabrician species of Papilio, in the Nymphales section; the wings of which are dentated, black, and marked with white spots; at the base of the anterior pair a blue streak, and another along the margin of the posterior ones. This rare insect inhabits India. Vide Donov. Ins. Ind. Obs. There is another species of the *Papilio* genus, that bears the same name, that ought by no means to be confounded with the above mentioned insect. This is also described by Fabricius in his "Entomologia Systematica," in the section "Satyri;" the wings of this kind are dentated, the colour brown, with a rufous ocellated band; posterior pair beneath fuscous with a cinereous stripe. This is *papilio ligea* of Scopoli, *æthiops* of Esper, and *medea* of the Vienna Catalogue. It inhabits several parts of Europe, but has not been hitherto discovered in Great Britain. The same specific name again occurs in Cramer's Papiliones, a strong variety of the Gmelinian *papilio nudicerta*, being so named by that author.

Blandrata, George, in *Biography*, a physician and divine of the 16th century, was born in the marquisate of Saluzzes in Italy, and practised physic in Poland and Transylvania; but upon his return to Italy, he was obliged by the inquisition to fly, on account of his religious opinions, from Pavia to Geneva, where he declared himself a Catholic. Here, however, his sentiments, which then inclined to Arianism, excited the suspicions of Calvin, which obliged him first to return to Poland, and afterwards, in 1563, to remove to Transylvania; where Sigismund, at that time sovereign of the country, appointed him his physician. After the death of Sigismund he sustained the same office to Stephen and Christopher Battori, and to the former when he obtained the crown of Poland. By his credit and influence the doctrine of Socinus, which Blandrata seems to have now adopted, made its way from Poland to Transylvania; and it was by his means that Faustus-Socinus was brought thither from Basil in 1578, to second his arguments and efforts in counteracting Francis Davides, who zealously opposed the custom of offering up prayers and divine worship to Jesus Christ. It is said, that Blandrata, either through natural levity, or under the influence of an avaricious disposition, abandoned the interests of the Unitarians, and he is accused by Socinus with inclining towards the Jesuits, who had obtained credit and influence at the court of king Stephen. His wealth, however, tempted his nephew to strangle him in his bed, at some period, not ascertained, between the years 1585 and 1592; and this unfortunate termination of his life has been charitably interpreted, both by the orthodox and heterodox, as a divine judgment. Of his character as a writer the theologists of Geneva express a contemptuous opinion; and his conduct seems to have been chargeable with a degree of unsteadiness and duplicity, which has been partly attributed to the persecuting spirit of the times in which he lived. Gen. Dict. Mosh. Eccl. Hist. vol. iv. p. 513, 525. Toulmin's Life of Socinus, p. 6, &c.

Blanes, or Blanda, in *Geography*, a sea-port town of Spain, in Catalonia, on the Mediterranean, 34 miles N.E. of Barcelona. N. lat. 41° 42′. E. long. 2° 45′.

Blanford, a township of America, in the West Riding of York county, Upper Canada, on the Thames, opposite to Oxford.

Blangis, or Blancy, a town of France, in the department of the Lower Seine, and chief place of a canton, in the district of Neufchatel. The population of the town includes 1749 persons, and that of the canton 12,879. The territory

territory comprehends 247½ kiliometres, and 31 communes: 14 miles N.N.E. of Neufchatel, and 20 miles E. of Dieppe.

BLANGY, a town of France, in the department of the Calvados, and chief place of a canton, in the district of Pont l'Evéque; the place contains 771 persons, and the canton 10,931. The extent of the territory includes 140 kiliometres, and 23 communes; 8 leagues E. of Caen, and 1½ league S. E. of Pont l'Evéque.—Also, a town of France, in the department of the straits of Calais, and chief place of a canton, in the district of Montreuil, 2 leagues N.E. of Hesdin.

BLANK, or BLANC, in a general sense, signifies WHITE; and BLANCUS, or BLANCA, is more particularly used for a kind of white or silver money, of base alloy, coined by Henry V. in those parts of France then subject to England, valued at 8d. sterling. They were forbidden by his successor to be current in this realm, 2 Henry VI. c. 9. In some ancient charters they were called "solidi blanci, or white shillings."

BLANK also denotes a small copper coin, formerly current in France, at the rate of five deniers Tournois.

They had also great blanks or pieces of three blanks, and others of six in respect whereof the single sort were called little blanks; but of late they are all become only monies of account.

BLANK, or *Blank ticket*, in *Lotteries*, that to which no prize is allotted. The French have a game, under the denomination *blanque*, answering to our lottery.

BLANK, in *Coinage*, a plate, or piece of gold, or silver, cut and shaped for a coin, but not yet stamped. See COINING.

BLANK-*bar*, in *Law*, is used for the same with what we call a "common bar," and is the name of a "plea in bar," which, in an action of trespass, is put in to oblige the plaintiff to assign the certain place where the trespass was committed. 2 Cro. 594.

BLANKS, in judicial proceedings, certain void spaces sometimes left by mistake. A *blank* (if something material be omitted) in a declaration, abates the same; 4 Ed. IV. 14. 20 H. VI. 18. and such a blank is a good cause of demurrer. Blanks in the imparlance-roll aided "after verdict" for the plaintiff. Hob. 76.

BLANK-*verse*. See VERSE and RHYME.

BLANK-*point*. See POINT-*blank*.

BLANKENBERG, in *Geography*, a sea-port town and fortress of Flanders, situate near the sea-coast, between Ostend on the S.W. and Cadsand island to the N. E. N. lat. 51° 18′. E. long. 3° 24′.—Also, a small town of Germany, seated on a mountain, in a prefecturate of the same name, in the circle of Westphalia, and duchy of Berg, 20 miles S. E. of Cologn.

BLANKENBURG, a principality of Germany, in the circle of Lower Saxony, belonging, since the year 1731, to the reigning house of Brunswick-Wolfenbuttel, for which he holds a seat at the diet of the empire, and pays 12 rix-dollars a month. This principality lies partly on and partly near the Hartz mountain, and is about 20 miles long and about 8 wide. The northern part, without the Hartz, consists of very good corn-land, but that which lies on the Hartz abounds in woods, quarries of marble, and mines of iron ore. A considerable part of the country is watered by the Bode. The capital town is of the same name; in which are held the courts of judicature and the consistory, with the superintendance of the principality. Near the town, on an eminence, is the ducal palace. It is 7 miles distant from Halberstadt.

BLANKENHAYN, a small town in the circle of Upper Saxony, and principality of Altenburg, belonging to a lordship of the same name, which is a fief of the electorate of Mentz; 17 miles E. S. E. of Erfurt.

BLANKENHEIM, a small town in Germany, and capital of a county of the same name, in the circle of Westphalia, and archbishopric of Treves. The prince, resident here, pays 64 florins a month, and 72 rix-dollars, and 54½ kreutzers to the imperial chamber; 36 miles N.N.E. of Treves. In the French arrangement it is the principal place of a canton in the district of Prum, and department of Sarre. The population of the place includes 500 persons, and the canton 3936. Its territory comprehends 19 communes.

BLANKENSEE, a lake of Germany in the circle of Upper Saxony, and middle mark of Brandenburg, 6 miles E. of Belitz.

BLANKENSTEIN, a town of Germany in a prefecturate of the same name, in the circle of Westphalia, and county of Mark, seated on an eminence near the Rhur, 19 miles E.N.E. of Dusseldorp.

BLANKET, in *Commerce*, a warm woolly sort of stuff, light and loose woven; chiefly used in bedding. The manufacture of blankets is principally confined to Witney in Oxfordshire, where it is advanced to that height, that no other place comes near it. Some attribute a great part of the excellency of the Witney blankets to the abstersive nitrous water of the river Windrush, wherewith they are scoured; others think they rather owe it to a peculiar way of loose spinning, which the people have about that place. Be this as it will, the place has engrossed almost the whole trade of the nation for this commodity; insomuch that the wool fit for it centres here, from the farthermost parts of the kingdom. Plott. Hist. Oxf. chap. ix. § 163.

Blankets are made of felt wool, i. e. wool from off sheep-skins, which they divide into several sorts.

Of the head wool, and bay wool, they make blankets of twelve, eleven, and ten quarters broad; of the ordinary and middle sort, blankets of eight and seven quarters broad; of the best tail wool, blankets of six quarters broad, commonly called cuts, serving for seamen's hammocks. See HYKES.

BLANKET, *tossing in a*, a ludicrous kind of punishment, of which we find mention in the ancients under the denomination *sagatio*. Martial describes it graphically enough. "Ibis ab excusso, missus ad astra, sago."

A late writer represents it as one of Otho's imperial delights. But this is turning the tables; that emperor's diversion, as related by Suetonius, was not to be the subject, but the agent in the affair; it being his practice to stroll out in dark nights, and where he met with a helpless or drunken man, to give him the discipline of the blanket.

BLANKOF, JOHN TEUNISZ, in *Biography*, a Flemish painter, was born at Alkmaar in 1628. After having spent some years in receiving instruction from Arent Tierling, Peter Scheyenburg, and Cæsar van Everdingen, he went to Rome, where he diligently copied the works of the best masters, and was admitted into the society of Flemish painters, called Bentvogels, by whom he was distinguished by the appellation of Jan Maat, signifying, in Dutch, mate or companion, and under which appellation, he is most generally known. His subjects were landscapes with views of rivers, or sea-shores, havens, or ports, which he executed with a light free pencil; and in the representations of storms and calms, he particularly excelled. Those of his pictures that are principally commended, are the Italian sea-ports, with vessels lying before them. And his most capital performance is a view of the sea-shore with the waves retiring at ebb-tide; which Houbraken describes as admirably beautiful and natural. His imagination was lively, and his execution rapid. He died in 1670. Pilkington.

BLANQUEFORT, in *Geography*, a town of France,

in the department of the Gironde, and chief place of a canton, in the diſtrict of Bourdeaux, five miles north of Bourdeaux. The place contains 2003, and the canton 9304 inhabitants. The territory comprehends 272½ kiliometres, and 9 communes.

BLANQUILLE, in *Commerce*, a ſmall ſilver coin, equivalent to about 11½*d.* ſterling, current in Morocco, and on the coaſts of Barbary.

BLANZAC, in *Geography*, a town of France, in the department of the Charente, and chief place of a canton, in the diſtrict of Angoulême, 4 leagues S.S.W. of Angoulême. The place contains 546, and the canton 10,440 inhabitants. The territory includes 242½ kiliometres, and 20 communes.—Alſo, a town of France, in the department of the Gard, and chief place of a canton, in the diſtrict of Uzes, 3 miles S. S. W. of Uzes.

BLAPS, in *Entomology*, one of the Fabrician genera of *coleopterous* inſects, the palpi of which are clavated, and four in number; jaws ſtraight and biſid; lip membranaceous and cleft; and the antennæ moniliform at the tip. Fabricius includes in this genus ſome of the *tenebriones* of Linnæus, ſuch as *tenebrio gages* and *mortiſaga*. Gmelin adopts the genus only as a ſubdiviſion of *Pimelia*, in the Syſt. Nat. See PIMELIA.

BLAPSIGONIA, compounded of βλαπτω, *I hurt*, and γονη, *brood* or *iſſue*, a kind of diſeaſe, or defect in bees, when they neglect or fail to produce young, being wholly employed in making honey.

BLARE, in *Commerce*, a ſmall copper coin, containing a little mixture of ſilver, ſtruck at Bern, and valued at much the ſame with the RATZE in other places.

BLARINGHEM, in *Geography*, a town of France, in the department of the North, and chief place of a canton, in the diſtrict of Hazebrouch, 2 leagues S. E. of St. Omer.

BLARNEY, a ſmall market town of the county of Cork, and province of Munſter, Ireland, ſituated on a river of the ſame name, about 4 miles W. of the city of Cork. In the reign of queen Elizabeth, its caſtle was reckoned one of the ſtrongeſt fortreſſes in Munſter, and it has often proved very troubleſome to the inhabitants of Cork. It belonged formerly to the earls of Clancarty, but at preſent is the property of Mr. Jeffries, whoſe father built the town, and eſtabliſhed ſeveral manufactures, of which Mr. A. Young has given a detail in the account of his tour through Ireland. Theſe eſtabliſhments, however, as too generally happens in like caſes, have not been ſucceſsful, and Blarney is not at preſent the flouriſhing town, which Mr. Young's account would lead us to expect. A paper-mill, a ſtamping-mill, a bleach-green, and one or two cotton manufactories ſtill exiſt; and many ſtockings made in the neighbourhood are ſold at the weekly market and in Cork, but all may be conſidered as on the decline. The caſtle and the grounds about it have been conſiderably improved, and the country around, as well as the park, is well watered. There is a ſtone at one of the corners of the top of the caſtle, which is ſhewn to ſtrangers, on account of a ſaying, that any perſon who has kiſſed it is privileged to lie and flatter. The origin of this ſaying, which is often referred to, and from which *Blarney* has become a vulgar ſynonim for flattery, the writer has not been able to diſcover. In the caſtle there is an original painting of Charles 12th of Sweden, at full length, drawn in the dreſs mentioned by Voltaire, brought over by one of the family who had been envoy to that monarch. The adjoining country is moſtly under corn and paſture; the ſoil is a yellowiſh clay, and is moſtly manured with lime-ſtone, of which there is a vein that ſupplies large quantities. Smith's Cork. Young.

BLAS, ST. a cape on the coaſt of the North Pacific ocean, near which, to the S. E., ſtands the town of Compoſtella, in the province of Galicia, in New Spain. N. lat. 21° 30′. W. long. 105° 12′. See BLAISE.

BLAS, a term, in the Helmontian philoſophy, denoting the local and alterative motion of the ſtars; from whoſe influence proceed changes of weather, ſeaſons, ſtorms, and the like.

In imitation of this *blas ſtellarum*, the ſame author framed another in animals, either natural, whereby each *viſcus* is framed according to the model of its particular; or voluntary, which is directed to motion by the will.

BLASCON, in *Ancient Geography*, an iſland of Gaul, mentioned by Pliny, ſituate at the mouth of the Rhone.

BLASE, ST., in *Geography*, a town of Germany, in the archduchy of Auſtria, 8 miles S.W. of Steyr.

BLASENDORF, or BALASFALVA, a town of Tranſylvania, in the diſtrict of Weiſſenbourg, the reſidence of the biſhop of Walachia.

BLASIA, from Blaſio Biagi, an Italian monk, in *Botany*. Lin. Gen. n. 1199. Mich. Gen. t. 7. Claſs, *Cryptogamia Algæ*. Species, 1. B. *puſilla*. Lin. Spec. 1605. Hudſ. Angl. 519. Dill. t. 31. f. 7. Fl. dan. t. 45. The dwarf blaſia grows on the ſides of ditches and brooks, and in moiſt ſhady places in a ſandy ſoil, in many parts of Europe; with us on Hounſlow heath, and alſo near Mancheſter and Halifax. It flowers in the beginning of May.

BLASII ZELLA, in *Geography*, a ſmall town of Germany, in the circle of Upper Saxony, and principality of Gotha, ſeparated in 1640 from the bailiwick of Reinhardsbrunn, and added to that of Schwarznot-wald, and famous for its foundery of fire-arms; 16 miles S. of Gotha.

BLASIMONT, a town of France, in the department of the Gironde, and chief place of a canton, in the diſtrict of La Réole, 7 leagues E. of Blamont, or 3½ N. of La Réole.

BLASIUS, GERARD, in *Biography*, ſon of Leonard, phyſician at Amſterdam, who received pupils into his houſe, to inſtruct them in the knowledge of medicine, particularly in the anatomy of brute animals, of which he diſſected a great variety. It was this which probably inclined Gerard to this branch of ſtudy, and gave birth to ſeveral of his works; ſuch as his "Zootomiæ, ſeu Anatomes variorum Animalium," publiſhed 1676; "Obſervata anatomica, in homine, ſimia, equo, vitulo, teſtudine, echino, glire, ſerpente, ardea, variiſque animalibus aliis," Lugduni, 1674, &c.

After making ſome progreſs under his father, he went, for further improvement, to Copenhagen, and at length to Leyden, where he commenced doctor in medicine, about the year 1646. He then returned to Amſterdam, where he acquired ſo much credit and reputation for his ſkill in his profeſſion, that in 1660 he was made profeſſor in medicine in the ſchools of that city, and ſoon after phyſician to the hoſpital.

Beſides a variety of original works, Blaſius publiſhed new editions of parts of the works of Primeroſe, Th. Bartholine, Licetus, Bellini, Borelli, and Willis, to moſt of which he gave notes and additional obſervations, containing ſuch diſcoveries on the ſubjects treated of, as had been made ſince thoſe works had been originally publiſhed. Of his original works, beſides thoſe mentioned above, we ſhall notice his "Oratio de noviter inventis," Amſt. 1659, 4to. "Obſervationes medicæ rariores, accedit triplicis monſtri hiſtoria," Amſt. 1667, 8vo. in ſix books, containing accounts of the diſſection of numerous morbid bodies, in one of which, the ſpleen, and in another the gall-bladder, were found to be miſplaced; in one two ſtomachs were found, in another three teſticles. "Anatome animalium terreſtrium variorum volatilium, aquatilium, ſerpentum, inſectorum, ovorumque ſtructuram

ſtructuram naturalem proponens." Amſt. 1601, 4to. The greater part of this work is collected from Severinus, Harvey, Malpighi, Willis, Bartholine, and other writers and journals. The work has, however, its utility, by bringing into a ſmall compaſs a great number of curious facts, and obſervations, which were only before to be found by recurring to a variety of publications. In a letter publiſhed in the third century of Th. Bartholine's epiſtles, Blaſius claims the diſcovery of the ductus ſalivaris, which he ſays he firſt ſhewed to Steno, then a young man. This has not, however, prevented the diſcovery from being attributed to Steno, the duct taking his name. For the titles of the reſt of the works compoſed or edited by Blaſius, ſee Haller. Bib. Anat. Med. et Chirurg. and Eloy's Dict. Hiſt.

BLASKET Sound, in *Geography*, lies on the weſt coaſt of Ireland, between the Great Blaſket iſland and Dunmorehead, on the mainland of the county of Kerry. In this ſound there is ten fathom water, and in the ſummer time and moderate weather a veſſel may ſtop off the eaſt end of the Great Blaſket; but the ground will not hold well in blowing weather. In paſſing through this ſound, it is neceſſary to attend to a pretty ſtrong tide, and to a rock not far from Dunmore point, which is covered at high water.

BLASKETS, Blasquets, or *Ferriter* iſlands, a cluſter of iſlands on the weſt coaſt of the county of Kerry, Ireland, being the moſt weſternly land in the European part of the Britiſh empire. They are five in number, beſides ſeveral rocks, ſome of which are always above water, and others are covered by high tides. Theſe iſlands were given by the earl of Deſmond to the family of Ferriter, from which one of their names is taken; but at preſent they belong to the earl of Cork and Orrery. The largeſt, called *Inniſmore*, i. e. the Great Iſland, and more commonly the *Great Blaſket*, was viſited by Dr. Smith, who found it inhabited by five or ſix families, and ſpeaks in high terms of the ſalubrity of its air. Ruins of churches, and cells or hermitages, are found in ſome of the others, but when Dr. Smith was there, they were not inhabited. The ſmall rocks are frequented by ſea-fowl, the feathers of which are collected by the people of the neighbouring coaſt. The hawks which are found here are remarkably good, and were formerly in much eſteem. Amongſt other ſea fowl the *ſtormy petrel*, (*procellaria*, Linn.) is common here. The Greater Blaſket is 9 leagues S.W. by W. from Louphead, the north point of the Shannon, and 5 leagues north of the Skeligs. The whole cluſter lie between 10° 17′, and 10° 31′ W. longitude, and between 51° 58′, and 52° 3′ north latitude. Smith's Kerry. M'Kenzie.

BLASPHEMY, *blaſphemia*, or *blaſphemium*, in *Middle Age Writers*, denotes ſimply the blaming or condemning of a perſon or thing. The word is Greek, βλασφημια, from βλαπτω, *lædo*. Among the Greeks, to *blaſpheme*, was to uſe words of evil omen, or that portended ſomething ill, which the ancients were careful to avoid, ſubſtituting in lieu of them other words of ſofter and gentler import, ſometimes the very reverſe of the proper ones.

Blasphemy is more peculiarly reſtrained to evil or reproachful words ſpoken of the Deity. Auguſtin ſays, "Jam vulgo blaſphemia non accipitur niſi mala verba de Deo dicere."

According to Lindwood, blaſphemy is an injury offered to God by denying that which is due and belonging to him; or attributing to him what is not agreeable to his nature.

By the Moſaic law, blaſphemy was puniſhed with death. Levit. chap. xxiv. ver. 13—16. As alſo by the civil law. Novel. 77. In Spain, Naples, France and Italy, the pains of death are not now inflicted. In the empire, either amputation, or death, is made the puniſhment of this crime.

By the canon law, blaſphemy was puniſhed only by a ſolemn penance, and by cuſtom, either by a pecuniary or corporal puniſhment. By the Engliſh laws, blaſphemies againſt God, and religion, as denying his being, or providence, and all contumelious reproaches of Jeſus Chriſt, &c. to which may be alſo referred all profane ſcoffing at the holy ſcripture, or expoſing it to contempt and ridicule, are offences by the common law, and puniſhable by fine, impriſonment, and pillory. 1 Hawk. P. C. And by the ſtatute law, he that denies any one of the perſons of the Trinity to be God, or aſſerts there are more Gods than one, or, having been educated in, and having made profeſſion of the Chriſtian religion, denies, by writing, printing, teaching, or adviſed ſpeaking, Chriſtianity to be true, or the holy ſcriptures to be of divine authority, for the firſt offence is rendered incapable of any office or place of truſt; and for the ſecond, adjudged incapable of bringing any action, being guardian, executor, legatee, or purchaſer of lands, and to be impriſoned for three years without bail. 9 and 10 W. III. c. 32. To give room, however, for repentance, if, within four months after the firſt conviction, the delinquent will in open court publicly renounce his error, he is diſcharged for that once from all diſabilities.

According to the law of Scotland, the puniſhment of blaſphemy is death. The firſt ſpecies thereof conſiſts in railing at or curſing God, and here the ſingle act conſtitutes the crime. The ſecond conſiſts in denying the exiſtence of the Supreme Being, or any of the perſons of the Trinity; and therein obſtinately perſevering to the laſt. For reiterated denial does not fully conſtitute the crime, becauſe the ſtat. of Charles II. 1661, admits of repentance before conviction as a complete expiation.

This ſtatute of 1661, is ratified by a ſtatute of king William, whereby the calling in queſtion the exiſtence of God, or of any of the perſons of the Trinity, or the authority of Scripture, or the Divine Providence, is made penal. For the firſt offence, impriſonment till ſatisfaction given by public repentance in ſackcloth. For the ſecond, a fine of a year's valued rent of the real eſtate, and twentieth part of the perſonal eſtate: and the trial in both theſe caſes is competent to inferior judges. The puniſhment of the third offence is death, to be tried only by the juſtices.

Blasphemy *againſt the Holy Ghoſt*. Divines are not agreed with reſpect to the nature of the crime thus denominated, Matthew, xii. 31. Mark, iii. 28, 29. Luke, xii. 10. and the grounds of the extreme guilt aſcribed to it. On this ſubject it may be obſerved in general, that from our Saviour's expreſſion this ſin appears to conſiſt, and to be completed, not in our thoughts, nor in our works, but in our words. Nor, indeed, is the epithet "blaſphemous," or any ſynonymous term, ever joined in ſcripture, as is common in modern uſe, with doctrines, thoughts, and opinions. It is never applied but to words and ſpeeches. A "blaſphemous opinion," or "blaſphemous doctrine," are phraſes, which, however familiar to us, are as unſuitable to the ſcripture idiom, as a "railing opinion," or "ſlanderous doctrine," is to ours. It may be alſo obſerved, that this blaſphemy is not of the conſtructive kind, but direct, manifeſt, and malignant. It is mentioned as comprehended under the ſame genus with abuſe againſt man, and contradiſtinguiſhed only by the object: and it is further explained by being called "ſpeaking againſt," in both caſes. The expreſſions are, in effect, the ſame in all the goſpels, where it

it is mentioned, and imply ſuch an oppoſition as is both intentional and malevolent. This could not have been the caſe with reſpect to all who diſbelieved the miſſion of Jeſus, and even decried his miracles; many of whom, we have reaſon to think, were afterwards converted by the apoſtles.

The learned Grotius, in order to mollify the ſeverity of the ſentence denounced againſt this ſin, ſuggeſts, that what our Lord expreſſes abſolutely, muſt be underſtood comparatively; and that he only deſigned to intimate, that it is very difficult to obtain the pardon of this ſin, but not that it will admit of no forgiveneſs. But our Saviour here ſays expreſsly of this ſin, whatever it was, both negatively, that it ſhall never be forgiven, and affirmatively, that the perſon guilty of it ſhall be obnoxious to eternal judgment, confirming the whole with an aſſeveration. Dr. Waterland (ſee his Serm. vol. ii. N° 9. p. 177—183.) ſeems to incline to Grotius's opinion; alleging that ἀδύνατον ſignifies only exceedingly difficult. Dr. Hammond comments upon the words with obſerving, that this ſin ſhall not be pardoned, but upon a particular repentance; but this is true of every ſin as well as of the blaſphemy againſt the Holy Ghoſt. Some have made this crime conſiſt in final impenitency, becauſe that is unpardonable; but it is not eaſy to aſſign a reaſon why this ſhould be called the ſin againſt the Holy Ghoſt. Others have repreſented it as, in its ſpecific nature, a wilful and obſtinate oppoſition to the truth; others again as a malicious oppoſition to the truth, on the part of thoſe who know and are convinced that it is the truth; whilſt ſome have ſuppoſed it to conſiſt in a renunciation of the truth for fear of ſuffering, which made Francis Spira think that he had committed this ſin. Mr. Wakefield, in his Notes on the Tranſlation of the Goſpel of St. Matthew, p. 178, is of opinion, that what is meant by the blaſphemy of the Spirit appears from the context to be perverſely reſiſting and belying with contumacy, againſt plain and ſatisfactory evidence, the operation and interference of the holy ſpirit of God; and he thinks, that thoſe men who reject the Chriſtian revelation, without contemplating its claims with diligence, candour, and exactneſs, upon a precipitate preſumption of its falſehood; and thoſe, who refuſe their aſſent to that degree of moral evidence, of which alone theſe ſubjects are capable, and which they would think ſufficiently ſatisfactory in other caſes, and in the ordinary occurrences of life, are as much guilty of the ſin of blaſphemy in our times, as thoſe cavilling and hypocritical Phariſees were in the days of Chriſt.

Dr. Tillotſon (vol. i. ſerm. xvii.) maintains, that this ſin, of which the Phariſees were guilty, conſiſted in maliciouſly attributing the miraculous operations which Chriſt performed by the power of the Holy Ghoſt to the devil. This ſenſe is adopted by biſhop Pearce, in his Commentary on the four Evangeliſts, vol. i. p. 85. But Dr. Whitby, with greater probability, refers it to the diſpenſation of the Holy Ghoſt, which commenced after our Lord's reſurrection and aſcenſion; and thoſe were guilty of the crime, who perſiſted in their unbelief, and blaſphemed the Holy Ghoſt, repreſenting him as an evil ſpirit. The crime was unpardonable, becauſe it implied a wilful oppoſition to the laſt and moſt powerful evidence which God would vouchſafe to mankind, and precluded the poſſibility of a recovery to faith and repentance. Whitby's Fourth Appendix to the Goſpel of St. Matthew, in his Paraphraſe, vol. i. p. 289.

Of this ſin, it is ſaid, it ſhall not be forgiven, either in this world or in that which is to come. With regard to the meaning of this expreſſion, it is obſerved both by Lightfoot (Hor. Heb.) and by Grotius (in loc.), that through a fond imagination of the final happineſs of all the ſeed of Abraham, the Jews ſuppoſed, there were ſome ſins that had not been forgiven here, which would be expiated by death, and be forgiven after it; and that our Lord deſigned by this expreſſion to aſſure them, that there was no forgiveneſs for thoſe who ſhould be guilty of this ſin, either before or after death, and that their expectations of forgiveneſs then would prove no other than a deceitful dream. Dr. Whitby, however, has clearly ſhewn, that this was uſed as a proverbial expreſſion, and that it only ſignified, "a thing ſhould never be," when it was ſaid, "It ſhall not be, either in this world, or in the world to come." Others, however, among whom we may reckon biſhop Pearce and Mr. Wakefield, have thought that the expreſſions of "this world," and "the world to come," denote the Jewiſh and the Chriſtian diſpenſations. Ὁ αἰὼν, and ὁ νῦν αἰὼν, ſay theſe writers, ſignify in the New Teſtament the Jewiſh age or diſpenſation, which continued till the annihilation of the Jewiſh polity, civil and eccleſiaſtical, by the deſtruction of Jeruſalem under Titus; and ὁ μέλλων αἰὼν, or the future age, denotes the Chriſtian diſpenſation. Biſhop Pearce adds, that under the Jewiſh law, there was no forgiveneſs for wilful and preſumptuous ſins; concerning which he refers to Numb. xv. 30, 31. xxxv. 31. Lev. xx. 10. and 1 Sam. ii. 25. With regard to the age to come, or the Chriſtian diſpenſation, the biſhop obſerves, that no forgiveneſs could be expected for ſuch ſinners as the Phariſees were; becauſe, when they blaſphemed the Spirit of God, by which Jeſus wrought his miracles, they rejected the only means of forgiveneſs, which was the merit of his death applied to men by faith, and which under Chriſtianity was the only ſacrifice that could atone for ſuch a ſin; in this ſenſe, as things then ſtood with them, their ſin was an unpardonable one. But, he adds, it is not to be concluded from hence, that, if they repented of this blaſphemy, they could not obtain forgiveneſs. Mr. Wakefield obſerves, that the unreſerved affirmation in Matt. xii. 32. muſt be interpreted, as well as the preceding verſe, with conſiderable qualification. Οὐκ ἀφεθήσεται, "will not be forgiven him," muſt ſignify, ſays this writer, "will not *readily* be forgiven—will not be eſteemed a *common* and *venial* fault," agreeably to the eaſtern mode of expreſſion, which conſtantly requires ſuch limitation. Accordingly he thus gives the general ſenſe of this verſe. "Offences of the moſt heinous nature, even reproach and injuſtice againſt the anointed prophet of God, may more readily find pardon, than contumacious blaſphemy of the Holy Spirit." This aggravated ſin, the reſult of obſtinacy, depravity, and malice in the extreme, will have no title to forgiveneſs, even from the clemency and mercy of the Chriſtian revelation, a revelation of pardon and peace, in the fulleſt ſenſe, and to the whole race of man. See Heb. vi. 4—7. Nevertheleſs, "will not any ſins be pardoned on ſincere repentance, and ſtedfaſt purpoſes of amendment, under that conſoling diſpenſation, which breathes nothing but reconciliation and forgiveneſs—nothing but favour, mercy, and peace, from God our Father, and our Lord Jeſus Chriſt?"

BLASQUES Island, in *Geography*, lies on the weſt coaſt of Newfoundland, in about 49° 30′ N. lat.

BLASS-ENT, in *Ornithology*. The common wild duck is called by this name in the vicinity of the lake of Conſtance.

BLASSENTE, (*Friſch. av.*) a name ſynonymous with *anas Penelope* of Linnæus, and *common widgeon* of Engliſh writers.

BLAST, *flatus*, in the *Military Art*, a ſudden compreſſion of the air, cauſed by the diſcharge of the bullet out of a great gun. The blaſt ſometimes throws down part of the embraſures of the wall.

Blast is alſo applied, in a more general ſenſe, to any forcible ſtream of wind, or air, excited by the mouth, bellows, or the like.

Blast, in *Agriculture*, a diſeaſe in grain, trees, &c. See Blight.

The ſugar-cane in the Weſt Indies is ſubject to a diſeaſe called the blaſt, and ſaid to be occaſioned by the *aphis* of Linnæus, which is diſtinguiſhed into two kinds, the black and the yellow; and of theſe the latter is the moſt deſtructive. It conſiſts of myriads of little inſects, inviſible to the naked eye, whoſe proper food is the juice of the cane, in ſearch of which they wound the tender blades, and conſequently deſtroy the veſſels. Hence the circulation being impeded, the growth of the plant is checked, until it withers and dies in proportion to the degree of the ravage. It is frequently affirmed, ſays Mr. Bryant Edwards (Hiſt. Weſt Indies, vol. ii. p. 215.) that the blaſt never attacks thoſe plantations where colonies have been introduced of that wonderful little animal, the carnivorous ant, or "formica omnivora" of Linnæus, called in Jamaica the "raffles ant," from its being ſuppoſed to have been introduced there by one Thomas Raffles from the Havannah, about the year 1762. Theſe minute and buſy creatures ſoon clear a ſugar plantation of rats; and their natural food ſeems to conſiſt of all kinds of inſects and animalcules.

Fire Blast. See Blight.

Blasts, among *Miners*. See Damps. See Mines, and Mining.

Blast, the term uſed at iron founderies to denote the column of air introduced into the furnace for the purpoſe of combuſtion. Its velocity is occaſioned by the impelling power of the blowing machine forcing the whole contents of the air-pump through one or two ſmall apertures called noſe-pipes; and, according to the abſolute power of the engine, air of various denſities will be produced, ſo that denſity and velocity are always intimately connected, and mutually implied.

The well-known combuſtibility of iron, and the indiſpenſible neceſſity of exciting combuſtion by the introduction of large quantities of condenſed air into the furnace, in contact with ore in various ſtates of maturity as to ſeparation, into contact with iron exiſting in all the modifications of quality as to carbonation, and into contact with an immenſe body of ignited fuel, render this ſubject the moſt important in the major ſcale of our manufactures. Unfortunately for art, as well as for ſcience, few practical deductions can be brought forward to eſtabliſh any one theory of blaſt; one common principle only is acknowledged, that all reduction in the furnace is in conſequence of the combuſtion excited by the column of air introduced.

To take a proper view of this intereſting ſubject, it will be neceſſary to ſubmit it to the following diviſions.

1ſt. Combuſtion, as excited in this particular branch of manufacture.

2d. The nature of the fuel ſubmitted to combuſtion.

3d. The denſity of the air.

4th. The quantity.

5th. The properties which follow as a conſequence of denſity and quality.

1ſt. Combuſtion in the blaſt furnace conſiſts chiefly in the rapid reduction of a given quantity of ſolid fuel, and its accompanying portion of ore, in the ſhorteſt poſſible time. That furnace, and that blaſt, which can, in a given time, reduce the greateſt quantity of fuel, all things elſe being alike, will always manufacture the greateſt quantity of iron. In common, before the introduction of the blaſt, the furnace is previouſly filled with alternate ſtrata of coke, iron-ſtone, and limeſtone, heated by ſimple atmoſpheric preſſure to a bright red or white heat, and the iron ſtone to a melting heat. This temperature is ſoon increaſed throughout the furnace, after the blaſt is applied. The blowing orifices or tuyeres of the furnace exhibit the fuel increaſing in whiteneſs, and the iron-ſtone rapidly diſſolving before the blaſt, of a blackiſh colour. At this period, the lava which flows from the furnace, in conſequence of the reduction of the ore and lime-ſtone, is conſiderably charged with iron, and is of a black, blackiſh brown, or greeniſh brown colour. Theſe appearances will continue for twelve, twenty-four, or thirty-ſix hours, according to the mode of treatment in bringing forward the furnace after blowing. The tuyere (if a bright tuyere furnace) will appear like a blaze of uncommonly pure light, at times very offenſive to the eye; it ſoon, however, becomes accuſtomed to it, and can with facility diſcern the individual maſſes of coke, as they are forced away, with the rapidity of lightning, before the irreſiſtible force of the air. The concrete ore and lime-ſtone are no longer viſible; but a fine metallic ſpray is conſtantly deſcending, and, forced from the fuel, precipitates itſelf to the bottom of the furnace. The ſcoria formed by the fuſion and union of the lime-ſtone, with the immetallic parts of the ore, is carried before the blaſt in a ſimilar manner and form, but eaſily diſtinguiſhable from the fluid metal by its buoyancy, want of velocity when impelled, and by its dull colour. In this ſtate, the furnace is deemed in excellent ſmelting order. The iron is generally revived with little loſs; and the colour and purity of the cinder or lava ſufficiently indicate the perfection of the ſeparation. When at any time the brightneſs of the tuyere fails, and becomes dull white or reddiſh white, then a change is indicated; the iron-ſtone and lime-ſtone will again appear in the ſolid unſeparated ſtate, and the change of colour in the cinder infallibly betokens an irregularity in the movements of the furnace. Theſe appearances are ſo general, as ſcarcely to admit of an individual exception, and are ſufficient to warrant the following explanation.

At the introduction of the blaſt, the interior of the furnace at the tuyere was ſimply a mixture of ignited maſſes of cokes and iron-ſtone, the latter partly ſemifuſed, but the greateſt part merely heated to a bright red heat. In the deſcent through the furnace, in contact with ignited coke, the particles of metal in the ore may, by parting with the oxygen, have received a diſpoſition to become revived. The increaſed temperature creates an additional tendency, by eſtabliſhing a greater force of affinity betwixt the fuel and the iron. But the metal approaching to its proper ſtate, meeting the current of blaſt, is immediately ſubject to a partial combuſtion. The portion thus oxydated conveys to the lava in proportion to its quantity and oxygenation, the colour already mentioned.

As ſoon as the continuation of the blaſt conveys a higher temperature to the ſuperior regions of the furnace, the appearance of the ſolid matter at the tuyere ceaſes. The fuſion and ſeparation of the metal from the ore are effected in ſituations more remote from the blaſt, or chief ſource of decompoſition in a temperature more ſuited to the nature and exiſtence of the metal. The iron, once formed into a fluid, and its fluidity preſerved, its deſcent to the blaſt is attended with little or no injury to its carbonation.

To underſtand this diſtinctly, it will be neceſſary to ſtate two curious facts relative to caſt iron in a fluid ſtate; and but for the exiſtence of theſe properties, the manufacture of the metal in open furnaces or veſſels would be totally impracticable. 1ſt. Caſt iron, while kept fluid, never decompoſes atmoſpheric air, and never itſelf becomes oxydated. 2d. The degree of carbonation paſſed upon the metal at the

moment it enters into complete fusion, continues without diminution or augmentation throughout the whole operation of the furnace; or, in other words, cast iron neither receives nor loses carbon whilst it preserves its fluidity. The first fact explains the reason why the iron is preserved from combustion, when it descends opposite to the current of blast. The second is a proof that the carbonaceous matter is conveyed to the iron in the furnace by a species of cementation previous to fusion; and that after this point, cast iron will not take up any addition of carbon.

To preserve and establish the relation of cementation and fusion in the furnace ensures uniform products. Combustion in this presents us with a gradation of temperature, diminishing from the tuyere upwards through thirty or forty feet of ignited matter. The inferior temperature towards the top of the furnace heats the materials to redness; an affinity is here commenced betwixt the carbonaceous matter and the oxygen of the ore; the latter is gradually removed, and a second affinity is instituted betwixt the de-oxygenated particles of metal and the carbon: this, as the ore descends to higher temperatures, is rapidly increased, and by and by the saturation of the coaly principle is complete. As the saturation of carbon always increases the fusibility of iron, the metal of the furnace enters into fusion at a comparatively low temperature, and speedily precipitates, through the high temperatures in the neighbourhood of the blast, to the general reservoir below.

It is not, therefore, necessary to suppose, that the great volume of air thrown into the furnace, and the great temperature of course excited, are necessary to the manufacture of the iron, so far as it regards quality; this, it is more than probable, may be injured by it, and even the economy of the manufacture itself. Quantity, however, is in general secured; but this is more the effect of mechanical reduction, than of any necessary operation of the blast upon the ore and materials above.

The quicker the body of cokes can be reduced, which occupy that part of the furnace between the point of separation and the tuyere, the greater will be the reduction of the whole, and the greater the quantity of manufactured metal. To this point the whole force of the blast is directed; here the chief part of the decomposition of the atmospheric air takes place; and here the destruction of the intervening cokes is effected, and that always in proportion to the quantity of air poured upon their highly ignited surfaces.

If we assume, with a blast of a certain density, any two points in the furnace, the one as the point of decomposition, and the other of separation and fluidity of the metal, suppose the former at the tuyere, and the other at the lower end of the boshes at A, (See *description of* BLAST *furnace*,) then it must be allowed probable, that a change taking place in the density, or even in the quantity of the blast, that change will affect not only the points themselves, but also their relative distances. The point of separation may be brought nearer (and perhaps injuriously so) to the level of the blast, the elevation of which is supposed to remain the same. The contrary may with equal truth be inferred; that if the point of separation is carried to a more elevated situation by a change or increase of temperature, the ore may enter into fusion before it has remained sufficiently long in contact with the ignited fuel, and thereby both the quality and quantity may be injured.

2d. Since pit-coal coke became the staple fuel at the blast furnace, the density and quantity of air deemed necessary to ensure combustion and quantity, have been yearly increasing. The various qualities as to hardness or softness, purity and effect, have given rise to a multitude of opinions, which are the most appropriate quantity and density of air for respective qualities of cokes. The blast of the furnace, in consequence, has at different places varied from $1\frac{1}{2}$ to 4lb. of expansive force upon the square inch of the air vessel. Most of the English works are blown with air not exceeding 2lb. upon the square inch, as being the most proper medium of density, and beyond which the materials would be overblown. English coal, in general, is soft in its fossile state, but rich in carbon, and free from mixture. In Scotland, where the coal is found in dense strata, and forms heavy coke, the blast is used from 2 lb. to 4 lb. per inch. Those who have adopted dense blasts declare, that quantity of iron is incompatible with a column of air inferior to the measure of their standard. Either the prejudice is very general, or there really must exist a direct analogy between the nature of the blast and the density of the coal.

The operations of the charcoal pig manufactory were conducted with blasts of a trifling density, seldom exceeding $1\frac{1}{2}$ lb. upon the inch, and often under this. Dense blast, it was believed, over-ran the furnace, most probably by exciting too great a temperature, and frequently had a tendency to discharge the materials from the furnace top. There never yet have been any direct experiments made to ascertain upon what this variety of pit-coal depends; whether exclusively from its density, or from containing the carbonaceous matter in more purity or greater disengagement. Perhaps both are necessary to be taken into account, before any satisfactory explanation can be given of the facts now stated and generally admitted.

3d. The density of a column of air depends upon the power of the blowing machine, and the proportion of the area of the steam cylinder to that of the blowing cylinder. Tables of the powers of steam engines, and the diameters of cylinders requisite to condense air from $1\frac{1}{2}$ lb. to 4 lb. upon the circular inch, will be found under the article BLOWING MACHINE. It will appear evident from these tables, that steam cylinders of the same diameter, and working at the same power, when employed to raise air of various densities, do not discharge the same quantity of atmospheric air in any given time. The larger the area of the blowing cylinder, the number of strokes being the same, the greater will be the quantity of air discharged into the furnace. The reverse is the case with blasts progressively more dense; so that any part of an engine's power may be employed, not in raising the true principle of combustion—air, but in condensing a comparatively small body of air, so as to give it additional velocity.

To fix the point, or maximum, of the most profitable density, has hitherto been unattainable. The circumstances deemed intimately connected with coal, render it necessary to accommodate the blast to the combustibility of the fuel: were this not the case, it would be difficult to overturn the following reasoning, and to exhibit an instance where it might not be found generally applicable. Combustion in the furnace will be excited in proportion to the quantity of air introduced. A blowing machine, that with the same power of steam cylinder threw into the furnace double the quantity of air, though of an inferior density, would reduce a greater quantity of combustible matter than one oppositely constructed; or, in other words, 5000 feet of air per minute entering a furnace would produce greater effects than 3000 feet, although the latter were compressed into nearly half the bulk of the former.

The most plausible theory of blast is to fix upon the lowest density at which the air can be forced into the furnace, and then proportion the diameter of the air pump to the power of the steam end. Suppose that this could be effected at half the density usually employed, then that part of the engine's

engine's power used formerly to compress the air to 3 or 4 lb. would now be employed in a blowing cylinder of larger diameter, raising per minute, or indeed per stroke, from 100 to 200 cubic feet of air. Opposed to this there stand two formidable objections, resulting from the necessity of using blow-pipes or nozles of increased diameters, from which to discharge the additional quantity of air, making up in area what is wanting in velocity to discharge the air in a given time. The first is a re-action of the air, so powerful as to issue back from the tuyere with a velocity little short of that at which it enters. This, with nose-pipes of 2, 2½, and from that to 3 inches, is scarcely felt when the blast is soft, and may be entirely obviated by a judicious arrangement of the tuyere iron and nose-pipe; but with pipes from 3 to 4 and 4½ inches diameter, the recoil increases as the squares of the diameters of the blowpipes, and even in dense blasts the recoil increases with the diameter of the discharging pipe. It is therefore probable, that to blow with a nosepipe 4 or 5 inches diameter, so as to have no recoil, a velocity or density of air would be requisite beyond any thing yet in use.

Those who advocate for the use of a soft blast, either upon the plea of their materials, or as being the most advantageous method of using any given mechanical power, frequently feel the full effects of the recoil of a considerable portion of the whole blast. But to obviate this, and to gain the advantage of the whole air, the blowpipe is enclosed in a moveable frame or building, which is made air-tight at every cast, and completely prevents the return of the smallest portion of it. The combustion at these furnaces is carried on with equal effect, and the resulting products in iron equal in point of quantity and quality to those where blasts of double density are used.

Again, at other furnaces, where a soft blast had been originally preferred, the plan of forcing back the recoiled air, in order to make up in quantity what was now deemed to be deficient in density or velocity, has been in vain attempted. The tuyere irons have become immediately heated, and burnt back with violence. The materials would not admit of the tuyeres being raised sufficiently high to prevent the cinder from flowing back into the bag, which connects the large and small pipes, and destroying it. Even in more than one instance, the entire tuyere side of a furnace has been lost in endeavouring to establish this plan of blowing, where either the materials would not answer, or from some misconception in the mode of operating. Where a furnace works uniformly with a dark or honey-combed tuyere, this mode of blowing may be attended with the greatest success. In all new erections, however, the blast ought to possess of itself sufficient velocity not only to enter the furnace, but to ascend through the materials, without admitting of any important recoil.

The second objection, arising as a consequence of the want of velocity, and of being obliged to use pipes of a larger diameter to carry in the full complement of air, arises from a belief that a large pipe never makes the metal of a good quality. This deduction is perhaps not altogether correct; but it seems highly probable, that in the use of a comparatively loose blast, only a small portion of the air passes through the furnace without decomposition. The point of separation may by this means be changed, or perhaps be raised too high for the preservation of the metal, immediately previous to separation. As the increased temperature prevails upwards, the affinity between the particles of metal in the iron-stone, and the carbon of the fuel, may be earlier established, and no ultimate evil consequence, in point of reasoning, ought to ensue. It appears from numerous observations, that the quantity of iron-stone, which a given weight of cokes smelts, and to the metal of which is conveyed the carbonaceous principle, is considerably dependent upon the diameter of the blowpipe. Supposing the ore of equal richness, the smaller the pipe, the greater burden will the coke carry, and the cheaper will the iron be made per ton, so far as materials are concerned. On the contrary, with large pipes, whatever the density of the air may be, the quantity of coals necessary to manufacture an equal quality of pig iron will be increased, and the cost of the iron is also enhanced. As an equivalent for this, however, the quantity is considerably increased with nearly the same amount of labour; so that it remains a question with the manufacturer, whether the additional cost of coal is compensated by the extra produce of metal he is enabled to bring to market.

4th. The quantity of air discharged into the furnace, under the appellation of blast, depends upon the number of strokes or cylinders which the engine makes per minute, and on the area and diameter of the air pump. This is independent of every consideration of density and increase of power in the steam cylinder, so long as the blowing or air cylinder remains the same, and the engine performs the same discharges; the measure of atmospheric air, which enters the furnace, will remain the same. The rapid improvements, which of late years have been made in the blowing machine, have increased the quantity from 1000 to 4000 feet per minute per furnace; and the quantity or produce in iron has been also considerably increased. We by no means, however, find that the increased manufacture of iron has been in the exact ratio of the quantity of blast thrown into the furnace. Many instances of late years have been noticed during the transition from the old to the improved modes of blowing, wherein the proportion has had little or no similarity.

Fifteen hundred feet of atmospheric air in one minute was found in most situations equal to the manufacture of twenty tons of melting iron; in the same situations, 3000 feet in the same time has never exceeded thirty tons per week; and in one particular trial for two weeks, the discharge of 6000 feet, being the whole produce in air of the engine, the produce in iron never exceeded 36½ tons. In the last case, the quality of the iron was irregular, and the quantity of cokes for each ton of metal thus produced was considerably increased, although the iron was of inferior carbonation.

Without recurrence to the diameter of the air cylinder, and the particular movements of the engine, the same facts have been frequently deduced from the diameters of the nose-pipes. We have frequently seen air discharged under a pressure of 2½ lb. upon each square inch, but with a pipe of 2½ inches diameter, reduce materials, and manufacture good melting iron to the extent of 20, 22, and 25 tons per week; and in the same furnace, and with the same materials, the air discharged by 2 pipes, each 2½ inches, under a pressure of 3 lb. upon each square inch, the produce never exceeded 30 tons of metal of an equal quality, but more frequently 25 to 28 tons. One observation still more direct, and made with a blast of a density equal to 2¼ lb. per inch, and discharged by one pipe of 2⅞ inches diameter, frequently manufactured 22 tons fine melting iron weekly; another pipe was added to the opposite tuyere of the same diameter, and the quantity of metal weekly was never increased beyond 32 tons, and upon an average of six months only 27 tons. These are curious facts relative to the nature and effects of blast, and exhibit the investigation of its principles as a matter of singular importance in the economy of the manufacture.

One remark was made relative to the burden of ore in the last stated fact, that with the small pipe a given weight of cokes smelted and carbonated the metal in 3 cwt. of iron-stone;

ſtone; but after the two pipes were added, the weight of iron-ſtone to produce an equal quality of iron, was reduced to $2\frac{3}{4}$, and afterwards to $2\frac{1}{2}$; producing in the firſt inſtance per charge $1\frac{1}{4}$ cwt. of iron upon an average, but latterly not above 1 cwt. and 1 lb. of iron of equal qualities. Another obſervation, in the ſame caſe, with every attention paid as to velocity, quantity, and temperature of air, may be adduced as of equal importance, though ſomewhat different in its mode of application.

Under a preſſure of 2 lbs. a $3\frac{1}{4}$ pipe was found upon the average of 18 weeks to manufacture 20 : 12 : 0 : 0 tons; a $3\frac{1}{2}$ inch pipe, 20 : 5. Upon an average of 11 weeks, and a $4\frac{1}{4}$ pipe, 22 : 5. Their reſpective areas, and iron produced, will ſtand in oppoſition thus:

$3\frac{1}{4}$ pipe,	area 10.6625	quantity of metal	20.12
$3\frac{1}{2}$ - -	12.25	- - -	20.5
$4\frac{1}{4}$ - -	18.0625	- - -	22.17

It is but fair to ſtate that the effects of combuſtion, ſo far as it related to the reduction of a quantity of fuel, was not in the ſame unequal proportion as the quantity of metal to the meaſure of the air. The quantity of reduction was with the

$3\frac{1}{4}$ pipe equal to	25
$3\frac{1}{2}$ - -	31
$4\frac{1}{4}$ - -	38

But the capacity of the fuel to carbonate the original quantity of iron, diminiſhed in nearly the ſame ratio as the combuſtion increaſed; ſo that the ſame meaſure by weight which carbonated 140 lbs. of iron with the $3\frac{1}{4}$ pipe, was unable to carbonate more than from 96 to 100 lb. of the ſame quality with the $4\frac{1}{4}$ pipe. This obſervation was made previous to the one laſt mentioned, and reaſoning upon the ſubject led to the practice detailed in that experiment. It will appear therefore concluſive, that the ſame body of blaſt may, with greater advantage and economy, be introduced through two pipes than through one, and this for two reaſons. The reduction is equal, and the quantity of fuel reduced, ſmelts and carbonates a larger portion of metal per charge; but it will appear from both caſes equally concluſive, that the capacity of the fuel to convey carbonation is in the ratio of the ſmallneſs of the pipe, or the reduction of the quantity of air.

This is in uniſon with what was ſtated under the particular "Combuſtion;" that a large volume of air, ſo far as it related to the inſtitution of affinity between the coaly principle of the fuel, was probably more hurtful to the carbonation than otherwiſe; but that in ſo far as it haſtened the completion of the affinities, the reduction of quantity, and above all increaſe of produce, though merely as an agent deſtroying the ſuperfluous fuel, it may be conſidered as giving the manufacturer a ſuperiority over his proceſs by means, the extent of which he never could formerly command.

Tradition has, though rather imperfectly, conveyed to us ſome facts which our forefathers ſeemed to have underſtood and practiſed with better effect than their poſterity. In operating with charcoal furnaces, and a blaſt proportioned to the ſcanty means then in uſe for the purpoſe of producing forge pigs, the whole air was conveyed into the furnace by means of a pipe 2, or at moſt $2\frac{1}{2}$ inches diameter; but when grey metal was wanted, the ſame body of air was divided and introduced by two pipes, whoſe joint capacity was equal to the former.

It appears therefore an inquiry of ſome importance to thoſe embarked in iron founderies, to aſcertain how far this tendency of the fuel to increaſe the carbonaceous principle proceeds in the ratio of the diminution of the blowpipe. If general obſervation confirmed the particulars here ſtated, the effects of carbonation might be greatly increaſed, and the quantity perhaps little reduced, by introducing the ſame quantity of air by means of four, ſix, or eight ſmall pipes, whoſe conjoint areas ſhould be equal to the original column of blaſt.

5. From quantity and denſity of air, there may and do reſult peculiar properties of blaſt, which may affect the operations of the furnace, and which once fully underſtood may help to explain the facts hitherto unaccounted for, and which we before noticed. Facts reſulting from accurate obſervation would prove an invaluable ſource of information upon this ſubject; and it is with regret that we can furniſh no perfect aerological table of the different temperatures of air under different denſities or degrees of compreſſion. The following, we believe, contains the only collection of temperatures hitherto noted; and as it relates to only one degree of compreſſion, the ſatisfaction it affords muſt be only partial.

TABLE of 30 obſervations made in ſummer upon various temperatures of air before and during the act of compreſſion, compared with the thermometer in the ſhade. The air thus aſcertained, was received into a magazine containing 2500 cubical feet, free from moiſture or damp entirely.

Temperature of the air at the lower valves of the blowing cylinder.	Temperature of the air at the upper valves of the blowing cylinder.	Temperature of the air ſcrounding the receiving veſſel.	Temperature of the air within the receiving veſſel.	Thermometer in the ſhade at the time of making the obſervations.	Increaſed diſt. of temp. between the included air, and average of the two firſt columns.	Increaſed diſt. between the included air and the temp. of the external air in the ſhade.
57°	70°	73°	90°	63°	$26\frac{1}{2}$°	27°
59	$61\frac{1}{2}$	75	$87\frac{1}{2}$	64	23	$23\frac{1}{2}$
61	71	$70\frac{1}{2}$	91	62	25	29
54	68	70	94	66	31	33
57	73	75	95	$65\frac{1}{2}$	30	$29\frac{1}{2}$
57	72	69	92	64	$27\frac{1}{2}$	28
53	70	69	96	64	$34\frac{1}{2}$	32
$54\frac{1}{2}$	74	70	$95\frac{1}{2}$	62	$31\frac{1}{2}$	33
56	$68\frac{1}{2}$	71	93	$61\frac{1}{2}$	$30\frac{3}{4}$	$31\frac{1}{2}$
57	69	73	$97\frac{1}{2}$	65	$34\frac{1}{2}$	$32\frac{1}{2}$
56	$70\frac{1}{2}$	$70\frac{1}{2}$	$91\frac{1}{2}$	64	$28\frac{1}{4}$	$27\frac{1}{2}$
52	68	72	88	61	28	27
54	$69\frac{1}{2}$	74	86	59	$24\frac{1}{4}$	27
51	71	71	$90\frac{1}{2}$	62	$29\frac{1}{2}$	$28\frac{1}{2}$
57	73	$79\frac{1}{2}$	94	64	29	30
55	69	73	93	$61\frac{1}{2}$	31	$31\frac{1}{2}$
56	72	$71\frac{1}{2}$	96	65	32	31
56	72	74	$97\frac{1}{2}$	66	$32\frac{1}{2}$	$31\frac{1}{2}$
53	71	70	99	68	37	31
51	$73\frac{1}{2}$	70	98	69	$35\frac{3}{4}$	29
52	75	72	$96\frac{1}{2}$	65	33	$31\frac{1}{2}$
55	72	73	94	62	$30\frac{1}{2}$	32
47	70	76	94	63	$36\frac{1}{2}$	31
51	70	77	91	58	$30\frac{1}{2}$	33
49	71	75	93	61	33	32
52	74	$74\frac{1}{2}$	98	67	35	31
$52\frac{1}{2}$	$72\frac{1}{2}$	74	101	69	$39\frac{1}{2}$	32
51	73	71	100	74	38	26
54	70	73	102	75	40	27
57	71	74	$99\frac{1}{2}$	68	$35\frac{1}{2}$	$31\frac{1}{2}$

TABLE of 30 obſervations of the ſame nature made in the winter months.

Temperature of the air at the lower valves of the blowing cylinder.	Temperature of the air at the upper valves of the blowing cylinder.	Temperature of the air ſurrounding the receiving veſſel.	Temperature of the air within the receiving veſſel.	Thermometer in the duct, at the time of making the obſervation.	Increaſed diff. of temp. between the inclofed air, and average of the two firſt columns.	Increaſed diff. between the inclofed air, and the temp. of the external air in the ſhade.
36°	58°	66°	49°	29°	2°	20°
33	54	64	55	30	11½	25
32	51	68	53	29½	11½	23½
33	57	61	50	29	5	21
36	55	60	51½	32	6	19½
31	52	63	50	28	8½	22
29	50	59	48	26	8¼	22
29	49	58	50	27½	11	22½
29	51	59	52	29	12	23
28	50	59	50½	27	11½	23½
30	53½	60	48	28	6¼	20
33	57	61	48	30	3	18
37	56	60	49½	31	3	18½
28	52	62	46	25	6	21
29	51½	59	47	24½	6½	22½
30½	53	59	49	28	6¼	21
33	55	60	53	29	9	24
34	55	60½	56	30	11½	26
32	55	62	54½	27½	11	27
35	56	64	55	30	9½	25
30	50	60	53	30	13	23
27½	50	61	50	28	11½	22
28	50½	62	49	26	9½	23
29	48	58	48	25	9½	23
28	47	58	49	11½	24	25
28½	50	58	47½	8¼	21	26½
28	49	60	53	14½	25	28
29	52	61	57	8½	24	27
31½	57	64	55	13¾	26	29
29	54	63	56	15¼	28	27

There can arife no doubt but that heat is extricated by compreffion from atmofpheric air; and that it is further probable, that the quantity of heat difengaged is in proportion to its condenfation. If, therefore, we are allowed to reafon upon this fubject, we fhould ftate the following as a confiderable approximation towards truth. It is univerfally believed and felt, that combuftion in the blaft furnace in June, July, and Auguft, is confiderably diminifhed, as a confequence of the increafed temperature of the air. The metal, in thefe months, is frequently debafed in point of carbonation, and diminifhed nearly one-half in point of quantity. We fhall fuppofe that this takes place at a temperature of 100, which has been proved to exift under a preffure of 2½ pounds. The reverfe of this happens in the cool feafon of the year, and particularly in the winter months. The furnace then yields the largeft quantity of iron, and in the moft profitable manner. This, with the fame probability, takes place at a temperature of 50 found in the table.

It would therefore appear to refult from thefe, that two-thirds, or one-half of the iron only, is manufactured at a temperature of 100, than in winter at 50. The difference between thefe degrees of temperature amounts to 50, and moft probably in combuftion affects the operation as fenfibly as the human frame is affected by a tranfition of temperature equal or fimilar. It is not neceffary now to ftate the difference between fummer and the denfer air of our winter, the circumftances of evaporation and aqueous folution; thefe fhall be particularly attended to in the general procefs of manufacturing iron. The great difference of temperature arifing fimply from compreffion feems to us adequate to explain many phenomena regarding the blaft furnace. Our knowledge, however, upon this fubject, can only be forwarded by a general collection of facts well afcertained, fhewing what are the various degrees of heat made fenfible by the compreffion of the blowing machine under every denfity; what the difference in temperature, the denfities being alike, when the air is received over water, in the air-vault, or in the regulating cylinder. From thefe it might moft probably refult, that the higher the denfity of the air, the greater would be the degree of heat manifefted; and it might alfo follow, that in the ratio of this denfity, or temperature, when the air was received over water, fo would be the evaporation or quantity of water fufpended in the air, and of courfe difcharged into the furnace.

This article may be concluded by the following remarks: —That all iron works are not alike affected by the heat of the fummer months. Many iron works preferve the quality of the iron, though at the expence of fuel, and with lofs of quantity; but at other places no extra quantity of fuel will compenfate, either as to quality or quantity, for the want of cool air. Neither fituation nor denfity of blaft will explain this curious circumftance; for with blafts of equal denfity and quantity, works fituated not 50 feet above the level of the fea have been found to manufacture a greater quantity of foft iron in fummer, than at a fimilar work, not ten miles diftant, fituated at leaft 250 feet higher. At both of thefe works the air is received over water; and no material alteration in the ufe of that air is or can poffibly be applied. The caufes of this difference muft be fought for in the nature of the coal and iron-ftone ufed at both works, the inveftigation of which, however intereffing, would prove a moft laborious undertaking.

Blast *Furnace*, a large conical or quadrangular building ufed at iron works for fmelting iron-ftones and ores.

Blast *Furnace, Defcription of.*

Plate (*Chemiftry*) II. *fig.* 1. repreffents a blaft furnace, and part of the blowing machine conftructed upon what at one time was the general plan at iron works.

A, the regulating cylinder, eight feet in diameter, and eight feet high. B, the floating pifton loaded with weights proportioned to the power of the machine. C, the valve by which the air is paffed from the pumping cylinder into the regulator; its length 26 inches, and breadth 11 inches. D, the aperture by which the blaft is forced into the furnace. Diameter of this range of pipes 18 inches. The wider thefe pipes can be with convenience ufed, the lefs is the friction, and the more powerful are the effects of the blaft. E, the blowing or pumping cylinder, fix feet diameter, and nine feet high; travel of the pifton in this cylinder from 5 to 7 feet per ftroke. F, the blowing pifton, and a view of one of the valves, of which there are fometimes two, and fometimes four, diftributed over the furface of the pifton. The area of each is proportioned to the number of valves, commonly they are 12—16. G, a pile of folid ftone building, on which the regulating cylinder refts, and to which the flanch and ftilts of the blowing cylinder are attached. H, the fafety valve, or cock, by the fimple turning of which the blaft may be admitted to or fhut from the furnace, and paffed off by a collateral tube on the oppofite fide. I, the tuyere by

by which the blaſt enters the furnace. The termination of the tapered pipe, which approaches the tuyere, receives ſmall pipes of various diameters from two to four inches, called noſe-pipes. Theſe are applied at pleaſure, as the furnace may be deemed to require an alteration in the volume or denſity of the blaſt. K, the bottom of the hearth, two feet ſquare. L, the top of the hearth, two feet ſix inches ſquare. KL, the height of the hearth, ſix feet ſix inches. L, is the bottom of the boſhes, which here terminate of the ſame ſize as the top of the hearth, only the former are round, and the latter ſquare. M, the top of the boſhes, twelve feet diameter, and eight feet of perpendicular height. N, the furnace top, at which the materials are introduced, or, as it is commonly called, charged; three feet diameter. MN, the internal cavity of the furnace from the top of the boſhes upwards, 30 feet high. NK, total height of the interior of the furnace, or working part, 44½ feet. OO, the lining. This is done in the neateſt manner with fine bricks, from twelve to fourteen inches long, three inches thick, and tapered to ſuit the circle of the cone. PP, a vacancy which is left all round the outſide of the firſt lining; three inches broad. This is ſometimes filled with coke duſt, but more often with ſand firmly compreſſed. This ſpace is allowed for any expanſion which might take place, either by an increaſed volume of the furnace itſelf in heating, or by the preſſure and weight of the materials when deſcending to the furnace bottom. QQ, the ſecond lining, ſimilar to the firſt. The object of this is to guard againſt the entrance of the flame into the maſs of common building, by rents which may take place in the firſt lining OO. R, a caſt-iron lintel, on which the bottom of the arches is ſupported, eight feet and a half long, and ten inches ſquare. RS, the riſe of the tuyere arch, fourteen feet high on the outſide, and eighteen feet wide. VV, the extremes of the hearth ten feet ſquare. This and the boſhing ſtones, are commonly made from a coarſe gritted ſand ſtone, whoſe fracture preſents large rounded grains of quartz connected by means of a cement leſs pure.

Fig. 7. repreſents the foundation of the hearth, and a full view of the manner in which the falſe bottom is conſtructed.

AA, the bottom ſtones of the hearth. B, a ſtratum of bedding ſand. CC, paſſages by which the vapour generated from the damps is paſſed off. DD, pillars of brick. The letters in the horizontal view of the ſame figure correſpond to ſimilar letters in the dotted elevation.

Fig. 8. AA, horizontal ſection of the diameter of the boſhes; the lining and vacancy for ſtuffing at M. C, view of the top of the hearth at L.

Fig. 9. Vertical ſide ſection of the hearth and boſhes, ſhewing the tymp and dam-ſtones, and the tymp and dam-plates. *a*, the tymp ſtone; *b*, the tymp-plate, which is wedged firmly to the ſide walls of the hearth; *c*, dam-ſtone, which occupies the whole breadth at the bottom of the hearth, excepting about ſix inches, which, when the furnace is at work, is filled every caſt with a ſtrong binding ſand. This ſtone is ſurmounted by an iron plate of a conſiderable thickneſs, and a peculiar ſhape, *d*; and from this it is called the dam-plate. The top of the dam-ſtone, or rather the notch of the dam-plate, is from four to eight inches under the level of the tuyere hole. The ſpace under the tymp plate, for five or ſix inches down, is rammed every caſt full of ſtrong loamy earth, and ſometimes even with fine clay. This is called the tymp ſtopping.

The ſquare of the baſe of this furnace is 38 feet. The extreme height, from the falſe bottom to the top of the crater, meaſures 55 feet.

BLAST *Furnaces, Conſtruction of.*

Theſe furnaces are ſometimes built of an external quadrangular form, entirely of ſand ſtone, and lined, in contact with the fire, of the ſame materials; ſometimes they are built conical, entirely of bricks, or with ſand ſtone on the outſide, and linings of both common and fine bricks within.

One great deſideratum in the conſtruction of furnaces, is to counteract the effects of a powerful expanſion, which always take place, to a greater or leſs extent, after heating, and the introduction of the blaſt, and which has frequently proved fatal to the exiſtence of the entire fabric.

In the general ſtyle of building, all are agreed that the pillars, which ſupport the arches, and of courſe the whole fabric, ought to be done in the moſt ſubſtantial manner. But beyond the arches, a variety of methods has been adopted to enſure a complete fabric, free from large openings or rents after a few weeks blowing.

Some iron-maſters are of opinion, that the ſame degree of firm building, that is beſtowed upon the pillars, ought to be continued to the top, with the addition of binders of flat iron preſſing with their edges againſt the body of the building, or with four ſcrewed bars, ſtill paſſing though the external building, and forming one ſquare binder, if the ſhape of the furnace is quadrangular. Another ſpecies of binder is uſed for ſquare piles, made of caſt iron of a prodigious ſtrength and weight. The individual pieces forming this binder, have, at their extremities, mortiſes, which mutually receive each other, with a conſiderable extra ſpace for the expanſion, which is invariably experienced afterwards. Other iron-maſters, again, prefer rearing a ſubſtantial ſhell of building, and filling the interior ſpace towards the linings, either with dry bricks, or ſtones looſely laid together. When the maſs of building becomes thoroughly heated by the kindling of the fire, and the introduction of the blaſt, the interior of the furnace expands conſiderably, and the action is ſuppoſed to be merely confined to the wedging together of the looſe parts of the building. By the time that this is effected, the expanſion is ſuppoſed to have ceaſed, and the exterior ſhell of the furnace is preſerved entire. Others, equally anxious to form a perfect building, have given an octagonal form to that part of the furnace above the arches, that the binding might be more happily effected. Some have aſſumed this form, with the addition of ſemi-circular receſſes in the ſides of the octagon; their convexes being ſtrongly arched to reſiſt the powerful preſſure expected from within.

Still more determined to defy the all-powerful effects of expanſion, others have hollowed furnaces from the ſolid rock, forty to fifty feet high, and lined theſe immenſe perforations with fine bricks in the uſual form.

Where ſuch a variety of form and of method exiſts in effecting the ſame purpoſe, and where the inſtances of experiment have been very numerous, every mode of conſtruction can boaſt of a ſolitary inſtance of complete ſucceſs, excepting in the caſe of the rock, which was only once attempted, and which, after the introduction of the blaſt, opened from four to ſix inches from top to bottom.

There are ſo many circumſtances to be taken into the account, beſides the mere form of the building, that unleſs theſe are all equally guarded againſt, the chances are in favour of the furnace opening conſiderably. If the building is conſtructed of ſand ſtone, and if this material is carried from the quarry as it is wanted by the workmen, an immenſe proportion of water is thus introduced, which by a little foreſight might have been avoided. Sand ſtones of common denſity as to fracture, contain, when taken immediately from the quarry, from

from 8 to 10 per cent. of water, and coarser gritted stones from 10 to 12. Taking the average 10 per cent., then in a furnace of equal dimensions to the drawing in *Plate* II. *fig.* 6. the sand stone of which will weigh upwards of 1200 tons, there will be introduced 120 tons of moisture. This quantity is always considerably increased by the portion of water necessary to reduce the lime to mortar, and frequently augmented by the moist state of the weather during building.

The evaporation of this immense body of water is the source of all the mischief which takes place in the shell of the blast furnace; nor is it much to be wondered at, where every precaution is not used to bring the heat forward in the most gradual manner, preserving the clearness of the vents, and allowing the moisture insensibly to pass away?

In situations where bricks can be obtained, the moisture of the sand stone is avoided, but the great extra quantity of lime, which is necessary to build with bricks, introduces through the medium of the mortar an almost equal quantity of water, as with sand stone. This has been obviated in part by using soft clay in the interior of the walls; but as clay seldom binds to any great extent, the general push of the furnace must be trusted to good binders from without.

In the construction of all blast furnaces, a complete ventage ought to be preserved by means of narrow flues, or passages proceeding horizontally from the middle of the solid shell, or within two feet and a half of the interior to the outside. These ought to be connected with a circular channel, or gutter, of the same dimensions, proceeding round the circumference of the furnace; so that if any one vent were choaked in the general expansion, the moisture conducted by it might easily vent itself among the other openings. The vents cannot well be too numerous; and as they seldom exceed four inches square, the building cannot be materially weakened by them.

In addition to the horizontal channel of communication, some builders carry up in the main building of the furnace four, six, or even eight perpendicular flues, which communicate with it and the openings that proceed horizontally to meet the external air. See *Plate* VIII. *figs.* 1, 2, 3, 4.

Either of these methods may be considered as just precautions to insure the existence of the furnace, but adopting them in the fullest and most complete manner, is not always accompanied with similar success. If circumstances formerly noticed concur in occasioning an extra degree of expansion, the pressure of the lining against the common building of the furnace often deranges the systematic order of the vents, pushes the bricks into contact with each other, and smothers for a little while, though to gain more fatal elastic effects, the increasing volume of the vapour.

After such a diversity of opinion upon a subject of such general importance, wherein each respective class of votaries can boast of complete success from its peculiar plan, it may be difficult to point out one more generally attended with good effects than another. The following, however, may deserve the serious consideration of the manufacturer of pig-iron.

Of whatever materials the furnace is constructed, let them possess no more moisture than is sufficient for their proper building. The thickness of the common building not to exceed, at its greatest breadth, 6½, or 7 feet. In the middle of the wall, a space of four or six inches ought to be left clear all the way to the furnace top. Into this vacuity should be introduced small fragments of sand-stone, about the size of an egg and under. When the expansion, proceeding from the fire building of the interior, causes the bricks immediately in contact to push outwards, the masses of sand-stone are immediately reduced in size, and filling the interstices occasioned by their former angular shape, actually occupy much less room; and now present to the flame or fire, should it be inclined to penetrate so far, a solid vertical stratum of sand, after having secured the expansion of the furnace to the extent of some inches. The effects of the pressure are thus diverted from the shell of the building, and lost in the pulverization of the fragments of sand stone.

The advantages resulting from this plan may be nearly doubled, by using a double lining of fire bricks, as represented in *Plate* VIII. *fig.* 3. betwixt each of which, and the common building, a similar vacancy should be left; but filled with sharp sand, containing no more moisture than serves to compact it into a firm body. As this moisture becomes gradually expelled in the slow heating or annealing of the furnace, the sand occupies less bulk, or, which is the same in effect, is then susceptible of a greater degree of compression when the general expansion of the furnace comes on. It is evident that the force is here also diverted against the sand in place of acting immediately, with a tendency to enlarge the circumference of the building.

Over and above all these precautions, the annealing or drying of the furnace in a progressive and regular manner ought to be carefully attended to and continued for two or three months at least. Many are blown much earlier, from an anxiety to get to work, and make returns for the great capital necessarily expended in these undertakings.

The same variety of opinions exists in the trade relative to the determined figure and dimensions of the blast furnace, as subsist, with regard to the best mode of building. Its height has, at different times, varied from 20 to 70 feet; and its diameter, at the boshes, or widest part, from 8 to 15 feet. It will be easy to trace the source of this indefinite mode of construction, and the uncertainty which must necessarily pervade operations of so much risk and importance.

At the time when charcoal of wood was the common, and indeed, the only fuel used in the blast furnace, the volume and extent of the blast were proportioned to the very imperfect state of the blowing machinery. Long experience had taught the manufacturer what were the proper size and dimensions of his furnace. Many of them were from 12 to 18 feet high, and some of them, where a good water wheel blast existed, reached as far as 28 feet in height.

When pitcoal was introduced into the blast furnace, in the state of coke, to produce similar effects to the charcoal of wood, it was soon found, that in furnaces of equal capacity and height the same effects could not be produced. The ore required to remain in contact with the ignited fuel for a longer space of time, in order, unquestionably, to produce, by attenuated contact, what was deficient in temperature, for the saturation of the ore with coaly matter. This would immediately suggest an increase of the height of the blast-furnace; and if beneficial effects once resulted from a step of this nature, it became a matter of difficulty to say where the progression of height would stop.

Hence, in a few years, arose furnaces of 40, 50, 60, and 70 feet in height. Of the last dimensions, one was erected in Wales. The size of the artificial crater was such, that the strength of the blast was scarcely sufficient to keep the existence of flame visible at the furnace top. After in vain endeavouring to ignite the immense body of materials contained in its vast capacity, the height of the furnace was reduced 30 feet by cutting a hole in its side, narrowing the mouth, and throwing in the materials at the height of 40, in place of 70, feet from the furnace bottom. This was attended

tended with ſucceſs, and the operations of the furnace proceeded with their uſual facility.

After the application of ſteam-engines to raiſe and condenſe air, the quantity and ſtrength of the blaſt became more a mechanical property in the hands of the manufacturer. It was ſoon diſcovered that an increaſed volume of air, by exciting a much higher temperature throughout the furnace, conſtituted the immediate action of thoſe affinities, which the tall furnace accompliſhed by a long attenuated contact, and that iron equally carbonated and fitted for the purpoſe of melting, could be produced by 30 hours contact, as in four days.

The conſequence of theſe gradual diſcoveries was a general predilection in favour of ſmall furnaces, and at preſent the bias of the manufacturer ſeems inclined to this extreme.—Where the maximum will be found it is difficult to conjecture, for the ground which the manufacturer now occupies is materially altered from what it was when ſmelting with coke was firſt introduced. The perfection to which the blowing machine has attained, forms a ſtriking contraſt to the feeble and diminiſhed effects of the bellows in the infancy of the trade. So far as the neceſſary affinity is increaſed, and more inſtantaneouſly produced in high temperatures, than in thoſe inferior, the manufacturer is differently circumſtanced, and commands an extent of means unknown to him in former times. That this ſuperiority will produce equivalent effects in the modification of the blaſt-furnace, requires but little demonſtration. Two facts illuſtrative of this may, however, be mentioned. Caſt ſteel has of late years been formed directly from bar-iron, by a proceſs which only requires an hour or two to complete, and with ſmall quantities of matter the ſame may be performed in a few minutes. This is effected by preſenting the carbonaceous matter to the iron at a melting temperature. In the uſual mode of cementation, bliſtered ſteel, by a more attenuated contact and inferior temperature, requires ſix or ſeven days to complete, what is here produced in two hours. The difference of temperature in the two operations is equal to 60° or 70° of Wedgewood. The firſt operation will be conſiderably ſhortened, if the caſt ſteel is required to hold much carbon; but if this requiſite is neceſſary in the bliſtered ſteel, the length of the cementation muſt neceſſarily be protracted. Again, a piece of malleable iron may, by preſenting it with a proper doſe of carbon, at a high temperature, be converted, in a few minutes, into a maſs of the richeſt carburated caſt-iron, which, in a temperature inferior, would have required ſeveral months.

The ſame facts will apply, in part, to the manufacture of pig-iron in the blaſt-furnace; but an unanimity of opinion and action on this ſubject is precluded, as well by the prejudices of individuals, as from circumſtances ariſing out of the nature of the materials operated upon in different places.

A furnace has lately been tried at Muirkirk in Scotland, only eight feet diameter acroſs the boſhes, in place of its former dimenſions, which were ten feet, and 40 feet high. It was ſoon found, that with the ſame volume of blaſt which was formerly applied to the ten feet furnace, very inferior effects were now produced. The combuſtion apparently was carried to too great an extent, and the materials, owing to this circumſtance, entered into fuſion before the iron had imbibed a ſufficient doſe of the coaly principle from the fuel. Another great evil which reſulted from this diminution of diameter, was a friction, or retardation of the deſcent of the materials upon the lining of the furnace. This evil was increaſed and the materials made more bouyant, by the uſual volume of air elevating itſelf in a coſe not much more than half its former area. The conſequences were, that the whole mixture of coke, iron-ſtone, and lime-ſtone, would have frequently hung for an hour together, or until the blaſt had cut all the hearth and boſhes clear of materials, a ſlip would have then enſued, and brought with it a large proportion of newly introduced matter. The introduction of this into the fuſing point before being properly heated, and long before any affinity had been eſtabliſhed betwixt the particles of metal and the carbon of the furnace, invariably changed the quality of the metal, and cauſed frequent and ſudden alterations from grey to white iron.

Upon the ſubject of height and width of blaſt furnaces, it may be finally remarked, that the average height in Britain may be taken at forty feet from the upper ſurface of the hearth bottom, eleven feet diameter at the greateſt width or boſhings, and three feet and a half for the diameter of the tunnel-head, or furnace-mouth.

If the proportions of height and diameter in the dimenſions of the blaſt-furnace have given riſe to a multiplicity of opinions, the internal ſtructure and ſhape of the cavity have been no leſs an ample field for ſpeculation and prejudice. At one time this was conceived ſo eſſential to the ſucceſs of iron-making, that any particular furnace that had made a fortunate run of quantity and quality, was copied with the greateſt accuracy of deſign. The fortunate iron-maſter ingeniouſly attributed to the mechaniſm of his own conſtruction the rich and ſuperior harveſt he had reaped in metal, and ſaw, or fancied he ſaw, in the curvature of a line, or in the inclination of a ſlope, the taliſman of his good fortune. By prolonging the one, or depreſſing the other, he immediately inferred that ſtill ſuperior effects would be produced, and that by obtaining the perfection of art in the mere fabrication of ſtructure, every thing that was great and powerful would enſue. This rage continued for many years, and gave riſe to an endleſs variety of ſhapes, many of which, in their eventual ſucceſs, had only the merit of originality to boaſt.

In the eſtabliſhment of this important and national manufacture, the great fluctuation of opinion as to ſtructure ſeems to have been the prelude to a ſubſidence into approved forms, founded upon general principles; and though we may now ſmile at the indiſpenſible forms which our predeceſſors, or even contemporaries, annexed to the blaſt-furnace, yet theſe alterations of ſhape and ſtructure lay the ſtrongeſt claim to our reſpect and gratitude. The path is now opened, and the ground already beat; from the labours of thoſe who have already gone before us, reſult the happieſt effects; we proceed towards our object, free from the interruption which inexperience always entails; and we may now, by the direct application of principle, perfect with facility what may ſtill be deemed deſiderata in this important branch.

The varieties of ſhape which cuſtom and experiment, from time to time, had annexed to the blaſt-furnace, may be claſſed under four diſtinct kinds. *Plate* VII. and VIII. The following deſcription, characteriſing the reſulting properties and dimenſions in the form of each claſs, will be neceſſary for comprehending the ſubject thoroughly.

Plate VII. *fig.* 1. is the vertical ſection of the blaſt-furnace cut acroſs the top of the boſhes; the internal ſhape entirely conical; the external figure a quadrangular pyramid. The conſtruction of this furnace is truly ſingular; and from this alone great advantages were expected to reſult. The originality of the principle conſiſts in the double ſquare, or throat. One immediately above the hearth, not repreſented in this figure, but ſimilar to the ſquare in *Plate* IX. *fig.* 1. B; and another half way up the cone, four feet in diameter; ſee A.

 B, the

B, the top of the boſhes, 12 feet in diameter.

C, an inferior diameter of 10 feet, previous to the formation of the throat at A.

D, the top of the ſecond row of boſhes, of the ſame diameter as B.

E, the furnace mouth, or termination of the ſecond cone, four feet diameter, and proportioned to A.

F, funnel top for carrying off the flame occaſioned by the blaſt, ſo as not to interfere with the workmen in filling the furnace.

The dimenſions, as to height, are as follow:

From B to C	height - - - - - -	12 feet
C to A	ditto - - - - - -	6
A to D	ditto - - - - - -	6
D to E	ditto - - - - - -	13
Height of the hearth, and firſt row of boſhings, not ſhewn in the figure, but being the ſame as *fig.* 1. *Plate* IX. meaſure - -		15
Height of the bottom ſtones, packing, and falſe bottoms, - - - - - -		4
Total height of this furnace from the foundation		56 feet

GG, fire brick lining.

hh, ſpace left for packing.

II, the common building either of ſand-ſtone, or of bricks.

Fig. 2. plan and ſection of the ſame furnace taken acroſs the boſhes at B.

AAAA, ſquare of the common building 29 feet upon the ſide, bound by BBBBBBBB, eight caſt-iron binders; the number or ſetts of theſe requiſite, being proportioned, both in ſtrength and dimenſions, to the height of the furnace. In common, a full binder is applied every ſix feet in the height.

The concentric circles repreſent the various diameters of the interior of the furnace, and are connected each by dotted lines, with their reſpective places in the elevation.

The reaſoning which we believe led to the conſtruction of this furnace, proceeded from a firm belief that the boſhes and throat or ſquare of a blaſt-furnace were of the greateſt importance on two accounts. Firſt, becauſe they ſupported the weight of the materials; and ſecondly, becauſe they concentrated the heat. Theſe acting conjointly, permitted the leaſt poſſible quantity of materials to paſs, till they dropt away in a ſtate of ſemi-fuſion, or complete ſeparation. In furnaces, however, the cones of which were 30 feet high and upwards, this was conceived impoſſible to take place for any length of time, to any conſiderable extent. The height and gravitating preſſure of the materials were more than ſufficient to counteract the moſt favourable conſtruction of boſhes; and as this could not admit of diminution, the ſuſpenſion of the materials, and the concentration of the heat muſt be effected by ſome other means. This, at one time, was believed to have been completely effected by the ſcheme of an additional ſquare, and an extra ſet of boſhes; and there is little doubt but that, by converting perpendicular to lateral preſſure, the ſuſpenſion of the materials was reduced at leaſt to one half of its former intenſity.

It was not doubted but that the proceſs of ſmelting and ſeparation would commence, in part, at A; that what eſcaped fuſion and ſeparation in that quarter, would be eaſily reſolved below; and that the proceſs of combuſtion intenſely at work in two different places at once, would greatly facilitate the general reduction, and add greatly to the produce in iron of the furnace. Theſe ſanguine expectations were unfortunately never realized, the ſolitary inſtance of one furnace only being conſtructed in defence of this theory, and that only for a very temporary endurance, is the beſt proof of the inutility of the plan.

Fig. 3. is the elevated ſection of a blaſt-furnace, of which ſeveral were built, and from which it was at one time conceived that the greateſt advantages were derived. The numerous minute gradations of diameter exhibited in the conſtruction of this furnace, were at one time held in high eſtimation by many iron-makers; and a plan of the preſent furnace circulated from the domains of the lucky projector, with as much care and conſciouſneſs of rich acquiſition, as an antiquary would remove from Herculaneum or Egypt, the precious remains of antiquated obſcurity.

It will be extremely eaſy to trace to its ſource this particular bias to form, ſo univerſally believed in at one time, but now conſigned to that oblivion which experience has taught us it deſerved at a much earlier period.

It often happens, that when repairing or re-lining a blaſt-furnace, the manufacturer avails himſelf of the time thus obtained, to overhaul and repair his engine and blowing machine. The former movements of the machinery may have diſcovered to him many errors both in movement and conſtruction, which the conſtant requiſite motion rendered impracticable for him ſooner to remove. In this way, conſiderable improvements on the engine and blowing apparatus are frequently made; and when again in motion, may, by increaſing the length and number of the ſtrokes in a given time, or by conferring a higher additional working power on the ſteam piſton, increaſe at the ſame time both the volume and denſity of the blaſt. If the produce of the furnace is increaſed, which it is highly probable will be the caſe, then the ſuperior effects are attributed to a few unimportant circles and lines added to the interior of the cone, the acuteneſs and proportion of which do not ſurvive the blowing of the furnace three days.

In like manner, if a work entirely new, commence operations with a greater advantage of blowing power, and with ſomething original in the ſhape of the furnace, the conſequent effects of the former are induſtriouſly attributed to the fortunate conſtruction of the latter, and the grand eſſential blaſt is entirely overlooked, and its next important aſſociates coal and iron-ſtone.

The dimenſions of the preſent furnace are as follow:

Diameter of the cone at A	- - -	3 feet
ditto at B	- - -	4
ditto at C	- - -	$8\frac{1}{2}$
ditto at D	- - -	$9\frac{1}{2}$
ditto at E	- - -	10
ditto at F	- - -	11
ditto at G	- - -	10
From G to F, the diſtance in height meaſures		1 foot
Increaſe of diameter -	1 foot	
F to E, the diſtance is -		12
Diminution of diameter -	1 foot	
E to D, the diſtance is -		$1\frac{1}{2}$
Diminution of diameter -	6 inches	
D to C, the diſtance is -		6
Diminution of diameter -	1 foot	
C to B, the diſtance is - -		2
Diminution of diameter -	$4\frac{1}{2}$	
B to A, the diſtance is - -		$4\frac{1}{2}$
Diminution of diameter -	1	
Height of the hearth and boſhes not repreſented in the plate - - -		13
Total height of the cavity of the furnace or place occupied by the materials -		40 feet

The former deſcriptions will ſuffice and apply to this plate,

plate, with equal propriety as to the former, regarding the lining, packing, common building, &c.

Fig. 4. is a plan and ſection of the ſame furnace at F in the elevation.

The inner circles repreſent the various diameters of the interior of the cone, the letters in each correſponding. The two external circles deſcribe the packing and lining; and the circle N exhibits the circumference of the common building of the furnace, which, at this particular ſection, is 26 feet in diameter.

Plate VIII. *fig.* 1. is the elevation of the interior of a furnace of a plain conſtruction, and at one time very prevalent at founderies. This faſhion was deemed to poſſeſs its peculiar merits, and ſtill maintains its form unaltered at ſome iron-works where the regular tapering cone is not yet admitted. Its inferiority, as to height, is amply made up by an enlarged capacity ariſing from its diameter.

Diameter at the mouth of the cone A	-	3 feet
ditto - at - B	-	11
ditto at the boſhes - C	-	12
Height from C to B -	-	12 feet
from B to A -	-	14
Height of the boſhings and hearth not repreſented in the figure -	-	11
Total height of that part of the furnace occupied by the materials -		37 feet

FF, repreſents a view of the vertical method of carrying off the moiſture and ſteam from the maſs of building, by means of vents. The number of upright flues vary from four to eight, and have regular communications by means of horizontal openings with the external air, GG. They are generally carried up parallel to the lining, and incline with the general diminution of the cone. The former, or vertical openings, are ſix inches ſquare, and the horizontal communications four inches ſquare.

Fig. 2. is a plan and ſection of *fig.* 1. in which are repreſented the lining, the vacuity for packing, and eight vents or openings correſponding to thoſe in the elevation. The letters in each figure correſpond, and the two dotted circles are meant to ſhew, that occaſionally all the vents communicate with each other by means of a horizontal gutter or channel, carried quite round the building. This precaution is uſed leſt any of the tubes were to fill up and choak the free circulation of the vapour, that its appropriate quantity may get eaſily diſcharged amongſt the other openings.

Fig. 3. is an elevated ſection of a furnace, the interior ſhape of which has now almoſt become univerſal. The regular and uniform deſcent of the materials which follows, as a conſequence of the gradual enlargement of the cone, fully juſtifies the general partiality in favour of this ſhape.

Diameter at the mouth, or opening A	-	3 feet
Diameter at the top of the boſhes B	-	10
The height from B to A -	-	$31\frac{1}{2}$
Height of the hearth and boſhes not ſeen in the plate - -	-	$11\frac{1}{2}$
Total height of this furnace	-	43 feet.

This form of furnace is not only conſtructed with a double lining of fire bricks CCCC, and two openings for introducing ſand for packing *bbbb*, but has alſo an opening DD, from top to bottom, about the centre of the common building. From this, in all directions, proceed ſmall vents, which communicate at a ſhort diſtance with the open air, as may be ſeen along the ſides of the building.

Fig. 4. is a plan and ſection of *fig.* 3. cut acroſs at B.

B, diameter over at the boſhes 10 feet.

CCCC, the two circles of fire brick-lining, as ſeen in the elevation.

bbbb, ſpaces for receiving packing.

DD, circular vent, or general gutter, from which ramify the horizontal openings.

Theſe are repeated at intervals of four feet in the height, as may be ſeen in the elevation. In building, DD is filled with fragments of ſoft ſand-ſtone, which are eaſily reduced in the expanſion of the furnace, and tend, by diverting its real preſſure, to preſerve the body of the building entire.

A ſimilar want of unanimity of opinion ſubſiſts among iron-makers, relative to the general conſtruction of the boſhes, their particular height, and moſt beneficial range. Some contend for flat, others for boſhes more vertical, while others again conceive the exertions of thoſe equally ſucceſſful, who adopt the mean of the two extremes. At different places, and to every poſſible range, have been attributed the moſt important conſequences in the ſubſequent proceſs.

Plate IX. *fig.* 1. repreſents boſhes of the ſteepeſt conſtruction.

Diameter at A	-	10 feet
Perpendicular height from B to A	-	8
Square at - B	-	$2\frac{1}{2}$

The opinion relative to this form is, that at firſt blowing, the boſhes are productive of a very proper degree of ſuſpenſion of the materials; but as the preſſure of the deſcent bears in every direction upon the under or bottom part next the ſquare at B, it becomes increaſed ſo much, that the weight of the incumbent materials early begin to preſs too much towards the bottom of the hearth, counteract the regular precipitation which ſhould take place, and impede the aſcent and full effect of the blaſt.

Fig. 4. is a ſection of boſhes approaching to, or indeed may be conſidered as the oppoſite extreme. Here the reverſe of the fact attributable to N° 1. takes place. The preſſure of the deſcending material is equally diſtributed over the very flat inclination of the boſhes, and there is no more weight deemed to be on the ſquare at A than is equal to a full column of the materials of ſimilar dimenſions, left by the direct tendency which the ſtrength of the blaſt to keep them in a ſtate of partial buoyancy. To counteract theſe advantages in part, very ſerious defects are here alſo imputed. If circumſtances unite to increaſe the tear and wear at A in any uncommon ratio, either by *ſcouring*, or from a deficiency in the quality of the ſtone or bricks, the whole of the upper part of the hearth at BB is immediately expoſed, and, though compoſed of a ſuperior quality of ſand, will ſoon follow the direction of the deſcending current. A preſſure of materials then takes place, equal to the whole of the increaſed ſpace, while the effect of the blaſt to bear them up is conſiderably diminiſhed by the enlargement of the original diameter. It will be ſeen from the plate that the weakneſs of flat boſhes at the top is ill calculated to withſtand any accumulating preſſure, and that by confining their part of the proceſs to the hearth, the latter muſt ſoon, by a ſimilar widening, be entirely deſtroyed.

Thoſe who wiſh to ſteer clear of extremes, or profit by the more adventurous ſpirit of their neighbours, more generally adopt a mode of boſhing that occupies the mean of the two former extremes. This is repreſented by *fig.* 3.

Diameter of the boſhes at A	-	10 feet
Perpendicular height from B to A	-	5
Diameter of the ſquare B	-	$2\frac{1}{2}$

In general, the boſhes of blaſt furnaces are made of the ſame ſand ſtone with the hearths, but of late fire bricks have been introduced with a conſiderable indication of advantage and

and permanency. When bricks are used, it is found of utility to make the whole part of the building solid, back as far as the external square of the hearth, so that if the boshes fail in part as to displace one layer of bricks, another surface, equally fresh and entire as the former, presents itself to the action of the fire.

Fig. 2. Ground plan of the top of the boshings of *fig.* 1. A A and B correspond to the same letters in the elevation. The dotted square C describes the form and dimensions of that part of the hearth immediately above the tuyere, as seen in the elevation CC. The large dotted square DD is the external size of the hearth, as seen also in the elevation DD.

Fig. 5. Ground plan of the square and boshings of *fig.* 4.

While we prosecute the detail and history of the construction of the blast furnace, the same diversity of plans formerly noticed comes under review, in every department of the erection. The importance of the hearth is admitted by every class of reasoners upon this subject; and to devise a form better calculated for smelting than another, has been an object of general concern with the manufacturer. Much as may be deemed to depend upon its form and construction, infinitely more benefit is derived from a proper quality of stone, to resist for a given length of time the powerful effects of a continued and unremitting blast. To both of these important desiderata much of the manufacturer's attention has been from time to time directed.

The first singularity that strikes us forcibly in the figure of the hearth, is, that in place of being circular, like the upper parts of the furnace, it is constructed of a square funnel-form, with angles as acute as represented in *Plate* IX. *fig.* 1. This narrowing form is continued on three sides of the square to the bottom of the hearth, where it generally measures from 22 inches to 24 inches. The top of the hearth, at B or A, *fig.* 1. and 4. or as it is commonly called the square, is never less than 30 inches, nor more than 33. The height of the hearth from E to B, *Plate* IX. *fig.* 1, 7 feet, and none are made higher. From C to B, *fig.* 3, $6\frac{1}{2}$ feet, which is now reckoned the most advantageous height; and from C to A, *fig.* 4, the hearth measures 6 feet, under which height there are no hearths ever attempted.

The structure of a hearth, properly speaking, consists of three solid sides only, the fourth, or front, is filled up by the tymp, or key-stone. *Plate* IX. *fig.* 1. The block E. is generally in one piece, and from four to five feet long, according to the height of the hearth. It descends towards the bottom till within two feet or two feet four inches, and then leaves an opening of similar dimensions, as to height, into the centre of the hearth or funnel, as at letter F.

As the square form in which the hearth is finished cannot last a day after the blast is introduced, and is even frequently destroyed in the act of annealing, or heating, it cannot be essentially necessary to the making of iron. The hearths of all furnaces when blown out, are entirely round, or if wasted more upon the tuyere sides, oval. The general usage of the square must have been derived from long acquired habit, or perhaps from the conveniency of working and finishing those immense blocks of stone which are still deemed necessary to the perfection of a hearth. The interior of charcoal of wood furnaces was at one time entirely square from top to bottom, so that in the progress of the trade, from smelting with wood to the use of pit-coal, although the general shape of the furnace has been altered, the square figure of the hearth has been retained.

Whatever may have been the utility of this general predilection in favour of established forms, the advantages hitherto supposed to be derived from this source are now by many doubted, and all those nice speculations relative to the precise dimensions and figure of boshes and squares, threatened with total annihilation. This innovation is not confined to figure alone, but extends to dimensions, and to the nature and bulk of the material necessary for the construction of hearths.

Fig. 1. *Plate* X. is the section of a hearth and boshings, constructed upon an enlarged principle as to size.

Diameter of the boshes at A	-	-	10 feet
Diameter of the hearth at B	-	-	4
Diameter of the hearth at C	-	-	3

These enlarged dimensions, in place of being square as formerly constructed, are now entirely round, excepting where the tymp stone forms the key to the front of the hearth, as may be seen in *Plate* X. *fig.* 2. where the external circle A A represents the diameter of the boshes, B, the termination of them, or the top of the hearth, and the form at C, a plan of the inside figure of the hearth across the bottom of the hearth at C, *fig.* 1. same plate.

The difficulty of always obtaining a sand-stone well calculated to stand the violent effects of the blast, the frequent great expence incurred, the immense loss of time sustained in cutting out old and putting in new hearths, and afterwards annealing them, has induced more masters to speculate upon the use of bricks of shapes larger than the common forms, made from good fire clay. No permanent advantage has hitherto been derived from this scheme, although it is abundantly obvious, that a successful experiment of this kind would lessen the expence of a hearth greatly, and save at least half the time now required to replace an old one.

Neither have any uncommon advantages resulted from the hearths laid down in *Plate* IX. *fig.* 6. and in *Plate* X. *fig.* 1, 2, and 3. While some approve, more are ready to condemn a measure, which has for its object the enlargement of a space before blowing, which too speedily becomes so afterwards. There cannot, however, be any objection to the circular, in place of the square form, unless a little additional workmanship is sustained as such. The matter rests with experience, accompanied by accurate observation, to prove the sanguine hopes of the projectors, or falsify the prophetic forebodings of those who now condemn the measure. The amount of our progress hitherto, in the making of pig-iron, is ascertained with certainty; to assign limits to its ultimate bounds would be presumption. Of one fact, however, we may rest assured, that the perfection of the steam engine, and the consequent command of blast, has alone done more for the manufacture of this article, than all those nice shades of distinction as to furnace taken collectively, which relieve each other in a successive train of minute gradation from one extreme to the other; to all, or to most of which, the most wonderful effects have been from time to time ascribed.

One subject of considerable importance still remains to be discussed, relative to the construction of the blast furnace; namely, the absolute and relative heights of the tuyeres, the dam-stone, and tymp.

On the subject of tuyeres, the general opinion is, that the nearer the cinder the blast is introduced, the greater is the effect as to the absolute quantity of reduction. But this may be productive of consequences more than sufficient to counterbalance the doubtful advantage of accelerated reduction, either by blowing the cinder from off the surface of the iron, and de-carbonating it, or by the cinder rushing back through the blow-pipe at any stop of the blowing machine, and destroying the leather bag which connects the blow-pipe with the main laying pipes. This never

happens

happens but a considerable portion of time is sacrificed, besides the expence of the bag.

In common, the surface of the tuyere plate is laid eight inches above the cinder, or, which is the same thing, above the level of the dam-stone. Some blow at a distance of four inches, others at six and eight, and some again as high as twelve and fourteen inches. However, under some circumstances, the height of the tuyere is determined by the nature of the materials. In these cases, if the tuyere is only raised one inch above its proper height, the bottom of the furnace lumps up immediately, and will invariably rise in the same progressive manner in which the tuyere is heightened.

Plate X. *fig.* 1. represents the relative proportions of height betwixt the dam, tuyere, and tymp, in ordinary cases.

G, the dam, or notch of the dam plate, 17 inches above the level of the bottom at H.

I, the centre of the tuyere 26½ inches from the surface of the bottom, and 9½ inches above the level of the dam.

K, the bottom of the tymp plate, 23 inches from the bottom of the furnace, and 6 inches above the level of the dam.

At iron-works where different opinions exist as to the proper or working height of the dam, very different relative heights ensue, regarding the tymp and tuyere. The former should always regulate the other two. The height of it is seldom used less than 16 inches, nor more than 28 above the bottom.

Considerable advantages result from placing the tuyere, as to its horizontal position, at a judicious distance from the front or back wall. This is, as in the case of height often regulated by the nature of the materials. If the furnace, owing to this circumstance, tends to work cold and languid behind, with a propensity to lump at the back wall, the blow-pipe ought to be directed as near to the extremity of the hearth backwards as it is possible to get in the tuyere iron; *Fig.* 4. *Plate* X. letter *a*; but where the operations of the furnaces proceed with ease and facility, the centre of the tuyere should more generally approach the centre of the hearth, as at *b*.

Of late years a new mode of blowing has been introduced, which, from its great prevalency and good effects, seems to bid fair to come into general use. Furnaces till lately were only erected with one arch, or tuyere side, and the blast or column of air introduced by means of one blow-pipe; now most of the new furnaces are built with double tuyeres, with two sets of main conducting pipes, and the blast introduced by means of two pipes in place of one.

The general effects and supposed properties of this mode of blowing are attended to under the article blast.

In the mean time, the proper height and distance of the tuyeres, and their relative position to each other, have been subject to endless disputation. *Fig.* 4. *Plate* X. *a* and *b* shew how, in common cases, the tuyeres are placed to each other in their horizontal range: *a* is placed with its centre three inches from the extremity or back wall of the furnace, and *b* at the distance of nine inches from its centre. That there should be a difference of distance in their horizontal position none are inclined to dispute; but that this should take place in their vertical situation, is by some contended; while others insist that the difference ought never to be less than four inches. *Fig.* 6. *Plate* IX. *ee.*

Some less fastidious assert, and with many evidences of sound reasoning on their side, that if the blast is introduced into the furnace, and at a proper distance, to keep the back wall clear, those nice distinctions as to inches go for nothing, in a region where an instantaneous increase of volume must destroy all repulsion or mechanical contact. This philosophical reason is flatly denied, and the contrary minutely and gravely asserted, that were two pipes placed every way immediately opposite to each other, the action of the opposite columns would retard the velocity of the air, and diminish the real elevated quantity in the furnace, by locking up in mutual opposition a portion of their respective quantities in the laying pipes. There might be some foundation for this conjecture, were the respective nozles or blow-pipes brought into actual contact, or inserted into each other; but to those who consider, that in most furnaces there is never less than four feet of distance between nozle and nozle, and the most of the intervening space filled with a column of semifused materials, ignited to the highest pitch of whiteness, this supposition will appear to rest upon very unsatisfactory grounds.

A less scrupulous class of observers and reasoners upon this subject even go the length to assert, that the tuyeres ought to be put in direct opposition, and that this, so far from being detrimental, would be found to possess unqualified advantages. This it is said would result from a certain degree of coolness which the extremity of each column of air confers upon its opposite tuyere iron, and prevent the same from heating and burning. To whatever cause it is attributable, the fact stands in many instances unquestioned, that not half the tuyeres are lost or burnt out, with the double blast, that was formerly destroyed, where the single blast was in use.

Fig. 7. *Plate* X. represents a tuyere iron, 16 inches wide, and 12 inches high at the wide end, 18 inches long and narrowing at the other end to 4 inches wide, and 4½ inches in height. *Fig.* 6. is a plan of the under surface of the tuyere iron. *Fig.* 5. represents the size and dimensions of the tuyere plate, which when bedded receives upon its surface the tuyere iron, *fig.* 7. This plate is first laid upon a bed of fire clay, with its narrow end towards the hearth, and inclined to rise a little. The tuyere is then introduced upon its surface, height and distance being attended to in the disposition of the plate, and the space betwixt its surface, and the sand-stone of the furnace, rammed very perfectly with balls of good fire-clay mixed with small fragments of fire bricks. When about to blow, the nose or inner end of the tuyere is covered with a very plastic clay, to prevent it from heating and burning away. This is always carefully attended to, and the blast put off at any time to replace it. Should it be neglected at any time, the iron would inflame with such rapidity, that an opening would be instantly made, by which the cokes and ignited matter of the furnace would be recoiled with the greatest violence imaginable.

Fig. 2. *Plate* XIII. The dam-stone. This is actually the dam, or barrier, which prevents the fluid contents of the furnace from advancing, and making their escape into the sand of the casting house. It is generally made from the same stone as the hearth, but is found still more difficult to stand for any length of time the action of the fluid iron, than the hearth to resist the ravages of the blast.

Fig. 3. dam plate. This is laid against the dam stone with a bed of fire clay interposing, and closes the front of the furnace. Its form is double, so that by turning it serves the purpose twice. It often fails, owing to the constant current of lava passing over the curvature *a*, and deepening it, till the iron flows over along with the cinder.

Fig. 4. the tymp plate. This embraces the under end of the tymp stone, and the sides of the hearth for three feet up. The thickness at bottom, called the heel, or cod, is preserved from the action of the fire by a strong stopping of clay.

The

This is replaced at leaſt every caſt, and prevents the flame and heated materials of the furnace from being blown forward.

Plate IX. *fig.* 4. is a ground plan of the arch pillars, hearth, tuyeres, and vents of a blaſt furnace.

A, the hearth, or particular ſpot where the fluid metal is collected.

B, the dam-ſtone.

c, the fall, or opening, by which the metal is diſcharged. After the caſt it is filled with ſand, which ſoon hardens and preſents a very cloſe texture to the fluid metal within. At the following caſt it is cut carefully down, till the bar penetrates to the quick. A circular inciſion is then made, and the metal flows out of the orifice in a connected round ſtream, into the runner or channel made in the ſand.

d d d d, four vents or openings which communicate with the falſe bottoms. *Plate* I. *fig.* 2. Theſe ſerve to convey the damp from the furnace bottom, and by being run out into the external air, two in the front of the hearth, and one at each tuyere, indicate by their temperature, and the quantity of ſteam or vapour which they emit, the real ſtate of the bottom below.

D D, the two pillars which ſupport the front arch; they, at the ſame time, ſerve as abutments to one leg of each of the tuyere arches. The arch at the front is 15 feet wide and 15 feet high, and inclines to the centre of the furnace, in the ſame manner as the ſide walls of the pillars approach.

E, main or back pillar built entirely ſolid.

FF, vent holes ſix inches ſquare, carried up from the foundation, and brought forward to meet the open air every four or five feet.

G G G G G G, tops of the pillars covered with caſt iron plates, for receiving three large caſt iron lintels, 10 feet long, and 10 inches ſquare. Theſe ſerve to give ſolidity to the arch, and ſupport the lining and boſhes of the furnace. *Fig.* 8, 9, different forms of tuyere pipes.

BLAST-*Furnace.—Hiſtory of its Origin and Progreſs.*

In detailing the progreſſive hiſtory of the blaſt furnaces, it is neceſſary to premiſe, that in this country it has undergone a revolution, of which we meet with no ſimilar inſtance in other countries.

The moſt natural and abundant fuel which preſents itſelf to mankind in their progreſs toward civilization, is that furniſhed by the numerous and extenſive foreſts, which generally occupy the ſurface of a wide and uncultivated country. Theſe, in the hiſtory of all nations, have been early appointed to domeſtic uſes, and to the comfort of individuals. As a country became more populous, and the ſpirit of civilization increaſed, other advantages reſulted from the general uſe of wood as fuel. The amelioration of climate, and the clearing of large tracts of land, making it ſubſervient to the purpoſes of agriculture, were not the ſmalleſt benefits thus derived. As the progreſs of knowledge began to deviſe and eſtabliſh regular manufactories, to ſupply the wants of the thriving community, the ſame ſources of combuſtion were opened to the manufacturer and the artizan. Theſe, as they became ſucceſsful, were only preludes to other eſtabliſhments more extenſive, more lucrative, and entailing wants more difficult to ſupply. Among others the ſmelting of metals was no doubt of early origin, and equally dependent upon the woodland counties, in the immediate neighbourhood of the ores. In this claſs we can trace no metallurgical operation ſo hoſtile to the exiſtence of wood, as an extenſive manufacture of iron. If this manufacture, owing to the great and unexampled proſperity of the country, in place of remaining ſtationary, or exhibiting ſymptoms of decline, ariſing from a want of conſumption of the article, has increaſed in capital, in extent, and riches beyond all precedent, wood, the baſe of the manipulation itſelf, depending only upon a ſtock rapidly declining, the exiſtence of which was frequently incompatible with the views and intereſt of the landed proprietor, muſt ſoon have been annihilated, and the art of making iron loſt to the community.

In this ſingular ſituation was Great Britain placed from the reign of Charles II. to the middle of the laſt century. The increaſing manufactures, commerce and general proſperity of the country called loud for an additional ſupply of articles fabricated from iron, while wood, the foundation of the whole art, was rapidly declining in point of quantity, without the moſt diſtant proſpect of ever being again renewed. Pit coal had been long before the latter period ſuggeſted as a ſubſtitute, but prejudice, intereſted views of eſtabliſhed capitaliſts, and above all, a want of command of mechanical power, had prevented any ſucceſsful operation from being eſtabliſhed in this new department of iron making. No ſooner, however, were theſe barriers to improvement broken through, and a change of fuel in the blaſt furnace found to be attended with profitable effects, than the languiſhing ſtate of the trade began to revive, and improvements ſucceeded each other, with a facility new and aſtoniſhing. In fifty years the revolution was complete whether the conſideration regards the increaſe of the manufacture, the general uſe of pit coal in the blaſt furnace, or the almoſt total annihilation of the charcoal mode of making iron.

It is uncertain at what period the manufacture of iron commenced in Britain. It is probable, that the working of the tin mines of Cornwall, by the Phœnicians, would introduce into the country a claſs of men ſkilled in all the then known metallic ores, capable of appreciating their true value, by converting the riches of an unexplored country, either to their own immediate neceſſities, or to the conveniences of the unſkilful inhabitants. The invaſion of England by the Danes, and their conſequent eſtabliſhment, would moſt likely add to the former ſtock of knowledge, in the art of mining and fuſing iron ores. Whatever truth there may be in this conjecture, the fact ſtands unqueſtioned, that in ſeveral counties in England large heaps of ſcoria are found with an accumulation of ſoil ſufficient to bear large trees. Theſe have been from time immemorial called "Danes cinders." So early as 1620, Dudley remarks, that large oaks were then found in a ſtate of decay upon the tops of ſome of theſe hills of ſcoria. It is not, however, probable, that theſe cinders were the product of the blaſt furnace. At a period ſo remote as that, wherein theſe heaps of ſcoria muſt have been accumulated, the labours of the iron maker were chiefly directed to the fabrication of ſmall portions of malleable iron in *foot blaſts* and *bloomeries*. The art of moulding and caſting in iron was either totally unknown, or ſo very rude, as to excite no intereſt in favour of proſecuting this fine branch of art. If pig or caſt iron was at all formed, it was merely of the moſt infuſile nature, for being ſpeedily converted into malleable iron. It was not till long afterwards, when improvements had taken place in the rude machinery of the times, and a diviſion of labour ſeemed to be productive of many advantages, that different furnaces exiſted: one for the making of pig iron, and another for the converſion of it into malleable iron. This firſt gave riſe to the blaſt furnace, which, properly ſpeaking, was an improvement reſulting from the knowledge of the advantages derived from a diviſion of labour. After the appropriation of the blaſt furnace to the excluſive manufacture of pig iron, the manufacturer would ſoon diſcover, that the products of

his furnace were frequently different from each other. Experience and obſervation would ſoon enable him to decide, from whence this had its origin. A ſmall additional quantity of fuel, beyond that he formerly uſed for forge-pig-iron, he found, would confer a degree of fuſibility upon the metal that immediately pointed out the practicability of caſting it into ſhape. Moulding from thence would moſt likely enſue, and become equally an appendage to the blaſt furnace as was the bar-iron forge. As this new manufacture became familiar to the proprietor, he would immediately find his intereſt in dividing the product of his blaſt furnace into grey melting iron or into forge pigs, as the exigencies of his moulding ſhop, or forge required.

If credit could be given to the "Metallum Martis" of Dudley, in the 12th year of James, anno 1615, there were at that period not leſs than 300 blaſt furnaces for ſmelting iron-ore with charcoal, each of which had fuel, upon an average, for 40 weeks per annum. The average produce in pig-iron at each furnace of 15 tons per week, or 600 tons per annum, makes the total yearly quantity 180,000 tons, being a greater quantity than has ever ſince been manufactured in Britain.

However much this quantity may be exaggerated, yet it is highly probable, that even at this early period, the iron buſineſs in general, and the particular operations of the blaſt furnace, had obtained an eminent rank in the manufactures of the country. The progreſs of agriculture, and the increaſe of population under the reign of the peaceable James, had taught the huſbandman and the proprietor the value of cultivated fields. The great conſumption of wood for the navy and iron-works had greatly exhauſted the principal foreſts of ſupply; tracts of country became cleared, and as the ſpirit of cultivation increaſed, the annual quantity of fuel for the manufacturing of iron diminiſhed.

It is probable that Mr. Dudley, in eſtimating the quantities produced from each furnace, formed his average from the winter and ſpring months, when water was plentiful, and he ſeems not to have made ſufficient allowance for the occaſional ſtoppages in ſummer, during the time of cutting and collecting the wood for the enſuing wet ſeaſon. If, therefore, in place of making 600 tons yearly, the furnaces of theſe days are ſuppoſed to have made each, upon an average, five tons per week, or making a little allowance, 250 tons yearly, which is ſurely nearer the truth, this ſtill leaves an annual amount of manufactured pig-iron equal to 75,000 tons, which, excluſive of the operations of the forge, forms a very reſpectable ſtaple at that early period of the hiſtory of our manufactures.

Pit coal had been long known before this period, and wrought at Newcaſtle prior to the year 1272. Annually vaſt quantities of it were exported to Holland and the Low Countries, for the uſe of the ſmithy, and other manufactures requiring an intenſe and continued heat. Yet in England prejudices ran ſo ſtrong againſt its application to the manufacture of caſt-iron, that the projectors of this original undertaking met with every obſtacle which the narrow unenlightened minds of the eſtabliſhed manufacturers could deviſe.

James granted ſeveral patents for the excluſive right of manufacturing iron with pit-coal. None of the projectors, however, were ſucceſsful, till the year 1619, when Dudley ſucceeded in making coke pig-iron in a blaſt furnace, though only at the ſparing rate of *three tons per week*. At this period many of the iron works were at a ſtand for want of wood, and the conſequence was an advance upon the price of iron: this rendered it a lucrative buſineſs to thoſe manufacturers whoſe ſupply of wood was ſtill undiminiſhed, and of courſe made them hoſtile to any innovation, whereby the preſent price of iron was likely to meet with a reduction.

This period of prejudice, ſo unfavourable to innovation in the iron buſineſs, was followed by one more general and more calamitous for the nation: amidſt the diſtraction occaſioned by civil war, neither innovation nor improvement could be expected. Patents, however, were granted to ſome during the common-wealth, for the excluſive manufacture in the new way, in one of which, it was at the time believed, that Cromwell was a partner: theſe partly ſhared the ſame fate with the firſt inventor, and none ſucceeded in eſtabliſhing a manufactory either of extent or certainty. In 1663, we find Dudley applying for his laſt patent, and ſetting forth, that at one time he was capable of producing ſeven tons of coke pig-iron weekly, with an improved furnace 27 feet ſquare, and bellows, which one man could work for an hour without being much tired.

It was not, till impelled by neceſſity, ariſing from the rapid decline of the annual growth of timber, that pit-coal became an object of univerſal eſtimation. When improvements on machinery had attained a pitch of certainty, and experience had taught the mechanic the manifold advantages of the ſteam engine; the adventurous manufacturer found he poſſeſſed an extent of means to which he was formerly a ſtranger. Small furnaces, ſupplied with air from leathern bellows, blown by oxen, horſe, or human labour, became exploded, and an increaſe of ſize took place, together with an increaſe of the column of blaſt neceſſary to excite combuſtion.

At this eventful era in the hiſtory of the blaſt furnace, when the ameliorating hand of agriculture was progreſſively ſweeping before it, what remained of the once immenſe tracts of woodland dedicated to the ſupply of the blaſt furnace; when the general improvement in machinery, and the introduction of the ſteam engine threatened to give new life and impulſe to manufactures in general, the iron buſineſs ſeemed dwindling into inſignificancy and contempt. The demand of the country increaſed for the manufactured article, particularly bar-iron, while every year ſaw a gradual but ſteady diminution of the annual quantity. Recourſe to foreign markets was had for a ſupply of that article, of which this country once was the greateſt exporter, and the immenſe annual importations from Ruſſia and Sweden may date their origin from that period. The flouriſhing and extenſive detail of Dudley no longer exiſted, and the 300 blaſt furnaces of his day were now diminiſhed to 59 in all; the total amount of whoſe annual produce was 17,350 tons, or nearly 300 tons to each furnace.

LIST of the Blaſt Furnaces in England and Wales immediately before the introduction of pit-coal, as a ſubſtitute for the charcoal of wood; the particular counties in which they were ſituated; the collective quantity of iron manufactured in each county, and the produce of each particular blaſt furnace.

Counties.	Furnaces in each county.	Names of the Furnaces.	Total num. of furnaces.	Iron made at each furnace.	Iron made in each county.
Brecon	1	Ynyſkedwyn - -	1	200	
	1	Lanithy - -	1	400	
	2	furnaces.			600
Glamorgan	1	Neath - -	1	200	
	1	Berſilly - -	1	200	
	2	furnaces.			400
		Carried forward	4		1000

Counties.	Furnaces in each county.	Names of the Furnaces.	Total num. of furnaces.	Iron made at each furnace.	Iron made in each county.
		Brought forward	4		1000
Carmarthen	1	Kidwelly	1		100
Cheſhire	1	Valercydle	1	600	
	1	Lawtone	1	600	
	1	Dodington	1	500	
	3	furnaces.			1700
Denbigh	1	Waddoch	1	300	
	1	Ruabone	1	250	
	2	furnaces.			550
Derby	1	Staveley	1	150	
	1	Foxbrooke	1	150	
	1	Wingworth	1	200	
	1	Wanely	1	300	
	4	furnaces.			800
Glouceſter	1	Blabney	1	600	
	1	Elmbridge	1	500	
	1	Flaxley	1	700	
	1	Redbrooke	1	600	
	1	Ditto	1	200	
	1	Sidney	1	250	
	6	furnaces.			2850
Hereford	1	St. Waynarde	1	300	
	1	Bingwood	1	450	
	1	Biſhopwood	1	600	
	3	furnaces.			1350
Hampſhire	1	New Foreſt Firne	1		200
Kent	1	Lamard	1	100	
	1	Barcline	1	100	
	1	Horſden	1	100	
	1	Handberſt	1	100	
	4	furnaces.			400
Monmouth	1	Pontypool	1	400	
	1	Ditto	1	500	
	2	furnaces.			900
Nottingham	1	Kirkby	1		200
Salop	1	Salop	1	400	
	1	Bowlden	1	400	
	1	Willy	1	450	
	1	Ditto	1	200	
	1	Leighton	1	400	
	1	Kimbrotten	1	250	
	6	furnaces.			2100
		Carried forward	37		12150

Counties.	Furnaces in each county.	Names of the Furnaces.	Total num. of furnaces.	Iron made at each furnace.	Iron made in each county.
		Brought forward	37		12150
Staſſord	1	Bradley	1	400	
	1	Wincheath	1	600	
	2	furnaces.			1000
Worceſter	1	Bewdly	1	200	
	1	Hated	1	500	
	2	furnaces.			700
Suſſex	1	Aſhburnam	1	500	
	1	Bubley	1	100	
	1	Bread	1	100	
	1	Robert's bridge	1	100	
	1	Bery	1	100	
	1	Darwille	1	100	
	1	Heathfields	1	100	
	1	Crunſuple	1	100	
	1	Lord Pelham	1	100	
	1	Ditto	1	100	
	10	furnaces.			1400
Warwick	1	Alton	1	400	
	1	Pooliband	1	300	
	2	furnaces.			700
York	1	Band, upper,	1	200	
	1	Band, lower,	1	200	
	1	Barnby,	1	300	
	1	Roſbley, upper,	1	200	
	1	Ditto, lower,	1	200	
	1	Chappel	1	300	
	6	furnaces.			1400
		Furnaces	59		17350

	Tons.	cwt.	qr.
Annual average for each furnace	294	1	1

By this ſtatement it is evident, that the manufacture of pig-iron had diminiſhed during one hundred to one hundred and thirty years preceding, upwards of 50,000 tons annually. Fortunately for the exiſtence of the trade, the application of good going, and what, at that time, would be reckoned powerful, ſteam engines, about the year 1750, for raiſing and compreſſing air, were introduced at ſome places where abundance of materials was found without water for turning machinery. The manufacturer now found that his produce could be increaſed by enlarging the diameter of his ſteam cylinder, or perfecting the vacuum under the piſton; and it was ſoon diſcovered, that theſe increaſed effects alone were requiſite to the formation of pig-iron, in profitable quantity from the coke of pit-coal; nor is it to be wondered that this ſecret remained ſo long a myſtery. The ſmall quantity of air that was formerly requiſite to ignite a charcoal furnace, whether from the great inflammability of the fuel, or the ſmallneſs of its capacity, was conſtantly before the eyes of the manufacturer. He had more often felt the effects of over-blowing, than under-blowing his furnace; and it is highly probable, that pit-coal, being deemed every way inferior,

inferior, an unusual timidity would precede any movement that might have for its object the enlargement of the column of air or the increase of its density.

This, however, once done away, there seemed no end to the quantity of air that a coke blast furnace could with propriety receive before any bad consequences ensued. Density, however, was found inimical to quantity, and the same law was at last discovered to hold good regarding pit-coal as with wood, that the softer qualities could be over-blown, while the more dense and compact strata remained undiminished before a heavier blast.

The celebrated foundery of Carron was begun about the year 1760, and as was the custom of the times, the operation of blowing was performed by large bellows moved by means of a water-wheel. Pit-coal was the staple fuel in view, but the scanty supply of air, and its want of density, seldom permitted the produce of the furnace to exceed 10 or 12 tons weekly, and frequently in summer, the quantity was reduced even below this. The company collected immense quantities of charcoal wood, and found their blast much better calculated for the operation of smelting with it, than the uninflammable pit-coal obtained in their neighbourhood. Experience, however, gradually unfolded means of adopting machinery, more calculated to the nature of the coal fuel, more powerful wheels were constructed, the bellows was abandoned, and in their place large iron cylinders were introduced blowing both up and down. A larger column of air of triple or quadruple density was obtained, and effects equivalent to these great improvements followed at the blast furnaces. The same furnaces that formerly yielded 10 and 12 tons weekly, now sometimes produced 40 tons in the same space, and on the average in one year not less than 1500 tons of metal.

From the period (1750 to 1760) that pit-coal coke was applied as a substitute for wood charcoal in the blast furnace, the iron trade began immediately to revive, and its progress in England and Wales, in a period of 30 years, was truly astonishing. The general use of pit-coal, most unquestionably, occasioned an earlier relinquishment of many of the charcoal works, than would have otherwise been the case, but the collective manufacture had so much increased, as to render this an object of trifling importance.

The following is a correct statement of the annual manufacture of pig-iron in England and Wales in the year 1788:

Charcoal Blast Furnaces.	No. of Furnaces.	Tons at each.	Total in each County.
Gloucestershire	4	650	2600
Monmouthshire	3	700	2100
Glamorganshire	3	600	1800
Carmarthenshire	1	400	400
Merioneth	1	400	400
Shropshire	3	600	1800
Derbyshire	1	300	300
Yorkshire	1	600	600
Westmoreland	1	400	400
Cumberland	1	300	300
Lancashire	3	700	2100
Sussex	2	150	300
Total of charcoal furnaces	24		13100

	Tons.	cwt.	qr.
Average produce from each furnace	545	16	2
Former average produce	294	1	1
	251	15	1

Increased produce per furnace, from the year 1750 to 1788, attributable entirely to the general improvement of machinery, and the introduction of the steam engine, 251 tons, 15 cwt. 1 qr.

	Tons
About the year 1750 the annual quantity of charcoal pig-iron manufactured in England and Wales amounted to	17350
In 1788 the same was	13100
Decrease in charcoal iron betwixt 1750 and 1788	4250

attributable chiefly to the decrease of wood, but also in part owing to the use of pit-coal as a substitute in the furnace.

Coke Pig Blast Furnaces in 1788.	No. of Furnaces.	Tons at each.	Total in each County.
Shropshire	21	1100	23100
Staffordshire	6	750	4500
Derbyshire	7	600	4200
Yorkshire	6	750	4500
Cumberland	1	700	700
Cheshire	1	600	600
Glomorganshire	6	1100	6600
Brecknockshire	2	800	1600
Staffordshire 3 new furnaces expected to blow same year	3	800	2400
Total furnaces and coke pig-iron manufactured in 1788	53		48200

An article entirely new, which though not discovered, was rendered a profitable and highly useful manufacture in the last 30 years.

Average produce at each furnace 907 tons.

	Tons.
Total of charcoal iron	13100
Ditto of coke pig-iron	48200
Total of pig-iron manufactured in England and Wales annually	61300

At the same period in Scotland there were erected, and in blast, charcoal furnaces in the west Highlands, viz.

	No. of Furnaces.	Tons each.	Total.
Goatfield	1	700	700
Bunawe	1	700	700
Coke pig furnaces, viz.			
Carron	4	1000	4000
Wilsontown, or Cleugh	2	800	1600
Total quantity of pig-iron manufactured in Scotland	8		7000
Average produce for each furnace annually 875 tons.			
Total quantity of pig-iron made in England and Wales	77		61300
	85		68300
Annual quantity manufactured immediately preceding the introduction of pit-coal for furnace fuel	59		17350
Annual increase in 30 years	26		50950

The period of 1788 or 1790 may be called a new era in the manufacturing of pig-iron. The double power engine of Mr. Watt had now become more general, and was yearly

yearly finding its way into blaſt furnace works. The regular and increaſed effects of this very powerful machine were ſoon felt in moſt of the iron counties. The produce of the furnaces in metal greatly increaſed as to quantity, and as they became more proſperous, ſtimulated others to engage in ſimilar undertakings. New works were yearly projected, and ſeveral blowing furnaces annually added to the former liſt: ſo that in eight years the manufacture of pig-iron had nearly doubled itſelf.

The following table is a curious illuſtration of this fact. It was drawn up as an authentic document of the returns made from all the blaſt furnace proprietors in Britain, of the number of their furnaces, and the annual quantity of pig-iron manufactured at their reſpective founderies. Theſe returns were made at a time when it was in the contemplation of the legiſlature to impoſe a tax upon pig-iron, and are copied from Dr. M'Nab's letter to the chairman of the committee of the houſe of commons upon the ſubject of the coal trade.

NAMES of all the FURNACES in Great Britain, with the Exciſe Return of the Quantity of Pig Iron made in 1796; the Quantities ſuppoſed and calculated upon; and the Returns of the Quantities really made.

NAMES OF FURNACES.	No. of Furnaces.	Diviſion.	Exciſe Return.	Suppoſed Quantity.	Exact Return.	From whom this Information was received.
Apedale,	1	Cheſter	2100	1000	728½	T. S.
Silverdale,	1	Do.	2600	1200	1230	Ditto.
Bear poſt,	1	Cumberland	2080	1200	240	W. R.
Dudden,	1	Do.	1664	400	325	E. K.
Newland,	1	Do.	700	700	700	Exciſe.
Backbarrow,	1	Do.	700	700	769	E. K.
Dale Abbey,	1	Derby	474	474	443	A. R.
Morſey Park,	1	Do.	728	728	728	Exciſe.
Butterſby,	1	Do.	936	936	936	Do.
Flaxley,	1	Glouceſter	360	360	360	Do.
Foreſt of Dean,	1	Do.	20	20	20	Do.
Abbey Tintern,	1	Hereford	70	70	70	not exactly known
Biſhopwood,	1	Do.	500	500	947	E. K.
Cornbrook,	1	Do.	1000	1000	482	W. R.
Bringwood,	1	Do.	500	500	250	Do.
Leighton,	1	Do.	780	780	780	Exciſe.
Bowling,	2	Leeds	2000	2000	2000	J. H.
Wibſey Moor,	2	Do.	2000	2000	2500	Do.
Shelf,	1	Do.	1000	1000	1140	Do.
Birkenſhaw,	1	Do.	780	780	846	Do.
Reniſhaw,	2	Lincoln	500	500	705	J. W.
Old Park,	3	Salop	11332½	6240	5953	W. R.
Horſehay,	1	Do.	4927½	2080	1458 $\frac{4}{10}$	Do.
Lightmoor,	3	Do.	8946	6240	3498 $\frac{15}{20}$	Do.
Coalbrook Dale,	3	Do.	7175	4162	2659 $\frac{11}{20}$	Do.
Madely Wood,	1	Do.	3777½	2080	1856 $\frac{8}{20}$	Do.
Jackfield,	2	Do.	7086	4160	1820	Do.
Benthal,	1	Do.	2367½	1600	1334	Do.
Willey,	1	Do.	3702½	1600	1554½	Do.
Broſely,	1	Do.	1775	1400	1076½	Do.
Ketley,	3	Do.	7590	6240	5068 $\frac{19}{20}$	Do.
Snedſhill,	2	Do.	4730	3400	3367½	Do.
Donnington Wood,	2	Do.	4720	4160	3323	Do.
Cheſterfield,	1	Sheffield	940	940	940	Exciſe.
Little Brampton,	2	Do.	1800	1800	1560	Meſſrs. S.
Winger Worth,	1	Do.	1274	1274	1274	Exciſe.
Stavely,	1	Do.	1000	1000	761	W. W.
Park,	1	Do.	1092	1092	853	J. W.
Chapel,	1	Do.	1456	1456	1456	Exciſe.
Horncliffe,	2	Do.	1092	1092	712	J. W.
Elſhar,	1	Do.	800	800	950	Do.
Brelton,	1	Do.	250	250	250	Exciſe.
Holmes,	3	Do.	6000	6000	2000	J. W.
Aſhburnham,	1	Suſſex	172¾	173	173	Exciſe.
Clydach,	1	South Wales	1820	1820	1625	E. K.
Carried forward	63		107,318¼	77,905	61,722 $\frac{17}{20}$	

NAMES OF FURNACES.	No. of Furnaces.	Division.	Excise Return.	Supposed Quantity.	Exact Return.	From whom this information was received.
Brought forward,	63		107,318$\frac{1}{3}$	77,905	61,722$\frac{17}{20}$	
Blandare, - - -	1	South Wales	1404	1404	1500	E. K.
Blanavon, - - -	3	Do.	5460	5460	4318	Do.
Sirhowy, - - -	1	Do.	1820	1820	1930	Do.
Beaufort, - - -	1	Do.	1560	1560	1660	Do.
Penyca, or Ebbervale, -	1	Do.	1560	1560	397	Do.
Hirwain, - - -	1	Do.	1400	1400	1050	Do.
Melynicourt, - -	1	Do.	648	648	503	Do.
Ennisygedyr, - -	1	Do.	1352	1352	800	Do.
Caerfilly, - - -	1	Do.	600	600	695	Do.
Cyfartha, - - -	3	Do.	6000	6000	7204	R. C.
Plymouth, - - -	1	Do.	2000	2000	2200	E. K.
Pendarron, - - -	2	Do.	4000	4000	4100	Do.
Dowlais, - - -	3	Do.	4100	5400	2800	Do.
Llanelly, - - -	1	Do.	1664	1664	1560	A. R.
Dovey, - - -	1	Mid Wales	200	200	150	E. K.
Ruabone, - - -	1	North Wales	1560	1560	1144	W. R.
Brymbo, - - -	1	Do.	884	Silent		Do.
Brymbo-gate, - -	0	Do.	728	None		Do.
Penyvron, - - -	0	Do.	1498	Lead work		Do.
Pentrobn, - - -	0	Do.	1560	Do.		Do.
Carmarthen, - -	1	W. Wales	1056	1056	290	E. K.
Level, - - -	1	Staffordshire	1560	1560	1391	T. S.
Brierly, - - -	1	Do.	1300	1300	1046$\frac{1}{2}$	Do.
Deepfield, - - -	2	Do.	2600	2600	2526	Do.
Bilston, - - -	2	Do.	2340	2340	1429	Do.
Bradley, - - -	3	Do.	3640	3000	1920	Do.
Grave yard, - -	1	Do.	1260	1336	213	Do.
Dudley port, - -	1	Do.	1040	1040	869	Do.
Tipton, - - -	2	Do.	2080	2080	2203	Do.
Gospel Oak, - -	1	Do.			1613	Do.
Neath Abbey, - -	2	South Wales	3120	3120	1759	E. K.
	104		167,312$\frac{1}{4}$	133,965	108,993$\frac{7}{20}$	

SCOTCH FURNACES.

NAMES OF FURNACES.	No. of Furnaces.	Excise Return.	Supposed Quantity.	Exact Return.	From whom this information was received.
Carron, - - - - - -	4	5200	5200	5616	T. E.
Wilsontown, - - - - -	2		2080	2080	A. H.
Muirkirk, - - - - - -	2		3120	2878	T. E.
Clyde, - - - - - -	3		3640	2216	Do.
Omoa, - - - - - -	2		3000	2396	Do.
Devon, - - - - - -	2				
Goatfield, (Charcoal) - - -	1		1600	300	E. K.
Bunawe, Do. - - - - -	1			600	T. E.
	17		18,640	16,086	
Manufactured in England and Wales,	104		133,965	108,993	
Grand Total, - - - - -	121		152,605	125,079	

Average Produce of each of the English and Welsh furnaces, 1048 Tons per Annum.
Ditto of each of the Scotch Furnaces, - - - - 946

The demand for iron articles of all kinds in this country not only continued unabated after the period of 1796, but kept increasing in a greater ratio than formerly; so that in the short space of five years, situations were occupied for nearly 50 additional furnaces, or additions made to established works of that extent. Betwixt 1801 and 1802, it was ascertained that the following new furnaces were either building or actually in blast, in England, Wales and Scotland.

In England and Wales.

	Blowing.	Building.
Silverdale,	1	0
Snedshill,	2	0
Wibsey Moor,	1	0
Ketley,	1	0
Madely Wood	1	0
Burnet's Leasow,	1	0
Newcastle, Staffordshire	0	1
Cyfartha, South Wales,	1	0
Llanelly, Do.	1	0
Sirhowy, Do.	1	0
Beaufort, Do.	1	0
Plymouth,	1	0
Union,	0	1
Aberdare,	0	3
Tipton, near Bilston,	1	1
Bloomfield,	0	1
Longacres,	0	1
Wednesbury,	0	1
Staffordshire,	1	0
Coleford, Gloucestershire	1	0
Jackfield,	1	0
Old Park,	0	1
Donnington Wood,	0	1
Deepfield, Staffordshire,	1	0
Gornall Wood, Do.	1	0
Brierly Hill,	1	0
Bilston,	1	0
———, near Wolverhampton,	0	1
Dudley Wood,	0	5
Billingsly, Shropshire,	0	1
Newcastle upon Tyne,	0	2
	20	20

In Scotland.

	Blowing.	Building.
Muirkirk,	1	0
Glenbuck,	1	0
Calder,	0	2
Markinch,	0	2
Shotts,	0	1
	2	5
Total of new Blast Furnaces	22	25

Blowing and building in Great Britain; the produce of which, supposing them all to have gone to work at the rate of 1000 tons per annum, from each furnace, would amount to, from 47 furnaces, 47,000 tons,
Manufactured at, and previous to 1796, in } 121 furnaces, 125,079

168 furnaces, 172,079 tons

The respective proportions of this astonishing produce in pig iron manufactured in England and Wales, and in Scotland, will stand thus:

	Furnaces.		Tons.	
England and Wales, in 1796,	104		108,933	
Ditto, since that period,	40		40,000	
		144		148,993
Scotland, in 1796	17		16,086	
Ditto, since that period,	7		7,000	
		24		23,086
Grand total in Britain,		168	making	172,079

In recapitulating the interesting facts which will result from a review of the gigantic progress of this manufactory, the regular progressive quantity made at a furnace is remarkable, or, which is the same, a diminution of the number of furnaces to perform the same quantity of labour.

Dudley represents, that in his day, 1620, there existed, in England and Wales alone, 300 blast furnaces, for the sole making of pig-iron, to each of these have been assigned the yearly produce of - - - 250 tons.

At a period considerably after this, and before the use of pit-coal was found profitable in the furnace, 59 furnaces produced yearly 17,350 tons of charcoal iron, or each furnace average, 294

In 1788, there still existed in England 24 charcoal furnaces, which yearly manufactured 13,100 tons of metal, or from each furnace, on an average, - - - 545

At the same period, in England and Wales, 53 blast furnaces, at which coke was used, manufactured yearly 48,100 tons, which upon an average was nearly, from each furnace, - 907

The same year in Scotland, 8 furnaces produced 7000 tons of iron, or from each furnace, 875

In 1796, the number of furnaces in England and Wales amounted to 104, and yielded 108,993 tons of metal, which from each furnace was equal to - - 1048

The same year, in Scotland, 17 furnaces manufactured 16,086 tons of pig-iron, which is from each furnace, - - 946

These are by no means sufficient data to form an accurate opinion of the real progress or improvement of our blowing machinery in Britain. In the collection of furnaces in 1796, a number of charcoal blasts were included, which, from their general small produce, blowing only four, six, or nine months a year, reduces the average considerably on the whole. It may now be safely asserted, that the average produce in iron at pit-coal blast furnaces in England and Wales, is at melting iron works, - 1200 tons

Do. at forge pig works, 2000

This bears a very striking contrast to the early exertions of the manufacturers in the sixteenth and seventeenth centuries, and exhibits a wonderful example of the general and rapid improvement of machinery in the last 50 years. With the improvements of machinery, the advancement of the manufacture of iron in general, and particularly of coke pig-iron, has kept equal pace. Nor have we sacrificed quality to quantity, but the reverse; for the melting pig-iron of our time is much more calculated for every variety of casting, than iron, equally saturated with the coaly principle, made with wood charcoal.

By comparing the value of a ton of pig-iron at different periods for the last 200 years, a pretty accurate opinion may be formed of the increased price of labour at iron works, and of the increased value of an object of universal utility in all our arts and manufactures.

About

About the year 1620, charcoal pig-iron sold for	6l. per ton.
1788, ditto for melting, -	8l.
1798, ditto - -	9l. 10s.
Coke pig-iron, when first invented by Dudley, was sold at - - - - -	4l.
In 1788, it sold for -	5l. 10s.
1798, ditto - -	7l. 10s.
1802, melting iron was -	8l. 10s.
And smooth-faced N° 1. sold at - -	9l. 10s.

One thing is here worthy of remark, that in a period of 170 years one ton of coke pig-iron rose in value only 30s. i.e. betwixt 1620 and 1788; but that in the short period of 14 years following 1788, an advance of 4l. per ton took place. One thing only may be offered in extenuation of this immense rise, that part of it was owing to the misunderstanding that took place betwixt this country and some of the Baltic powers, which was no sooner adjusted than pig-iron fell in price. The article still, however, maintains itself at 8l. 10s. per ton, being double the rise in point of value in fourteen years that took place in the one hundred and seventy preceding the commencement of that period.

To point out proper channels, whereby to account for the annual consumption of such an immense quantity of raw materials, would prove a satisfactory source of information. The endless detail into which the foundery trade has now branched itself, the almost universal fabrication which it embraces, and the extensive diffusion of the sites of manufactories themselves, preclude the possibility of obtaining this with strict accuracy. The following statement, however, will tend to throw some light upon the subject.

		Tons.
It is reckoned, that the bar iron forges in Britain manufactured annually from pig-iron 40,000 tons of finished bars, which at the rate of 35 cwt. of pigs for every ton of iron bar produced, will account for - - - -		70,000
Consumed yearly in the erection of new furnaces, forges, machinery, &c. - -		5,000
Purchased by the board of ordnance in the state of cannons, mortars, carronades, shot, and shells, &c. on an average of 1794, 5, 6,	10,935	
Waste in melting from the pig, boring, &c. - - -	1,300	
		12,235
Purchased by the navy board in the state of ballast, &c. - - - -		2,664
India Company's annual supply in guns, shot, shells, carcases, &c. -	5,000	
Waste melting, boring, &c. -	700	
		5,700
Merchant guns, carronades, shot, &c. for arming trading vessels,	10,000	
Waste in melting and boring,	1,000	
		11,000
Ballast for Merchantmen and India men, -		5,000
	Tons	111,599

For the difference betwixt this and the total manufacture, recourse must be had to the large exportation to Ireland, and to the numerous and extensive casting founderies of London, Liverpool, Manchester, Birmingham, Workington, Newcastle, Edinburgh, Glasgow, &c. none of which melt under 2000 tons yearly, and many of them from 4 to 5000 tons of melting pig-iron.

We shall now leave this interesting subject with some general observations upon the origin and progress of the pig-iron manufacture, and its early use in the fabrication of castings.

It appears from Dudley, that towards the close of the reign of queen Elizabeth, blast furnaces had been constructed of size, and with machinery sufficient to produce upwards of two tons of charcoal iron per day. Such great products in iron were most probably confined to situations where there was abundance of water, and where water-wheels and bellows of a considerable magnitude were used. The more common modes of operation were confined to furnaces of an inferior size, which were supplied with air by means of hand-bellows, excited by cattle, or the labour of men. At the same period England enjoyed a considerable export trade, arising from her superior manufacture of iron guns, mortars, &c. As pit-coal had not been applied in any branch to the manufacturing of iron, it is probable, that these articles would be cast from the large blast furnaces; the flame of wood possessing but feeble effects compared to that of pit-coal, would render the application of the reverberating furnace, if then known, of no use in the casting of guns and mortars.

The non-application of pit-coal in every department of the melting foundery, would greatly retard the perfection, or even improvement of the art of moulding, and casting smaller and more general articles. The want of it, as the smelting fuel in the blast furnace, was long severely felt by the general backward state of the art of moulding and casting in this country, and allowed other nations with fewer advantages to get the start of us. It is highly probable, that long before the period formerly alluded to, the application of pit-coal had been speculated upon, either as an auxiliary, or as a substitute in every branch of the iron business. Its well known inflammability and tendency to form a cinder, and the general decay of wood, would furnish ample grounds for what, to many at the time, would be considered as idle and visionary speculations. The advantages arising from the trade, as it was then situated, had been rigidly ascertained, and fully appreciated by the established manufacturers. The business, in point of extent, seemed only limited by the supply of wood. New erections, for want of a proper supply of materials, became impracticable; those already engaged were more anxious to preserve their supply, however much circumscribed, than listen to innovation, which, by substituting pit-coal for the charcoal of wood, would likely give to the speculatist a great superiority in the market. It is also highly probable, that many of the iron works then established were at a considerable distance from pit-coal, the general introduction of which would prove fatal to their interests.

In this view of the subject, the adventurer with capital had every thing to hope, the established manufacturer every thing to fear, by change. Under these circumstances, the discovery, or rather the assertion of the practicability of making iron with pit-coal, was announced by Simon Sturtevant, esq. in the year 1612, who, upon application, was favoured with a patent from king James, for the exclusive manufacture of iron with pit-coal, in all its branches, for the long period of thirty-one years. In return, the said Simon Sturtevant bound himself to publish a faithful account of his discoveries, which afterwards appeared in quarto, under the title of his "Metallica." It is uncertain to what causes his failure was at the time attributed, but in the execution of his discoveries upon a large scale, he had found difficulties amounting to utter impracticability; for in the year following, he was obliged to make a surrender of his letters of monopoly.

The

The ſecond adventurer in this unexplored path we find to have been John Ravenſon, eſq. who, like Sturtevant, was ſucceſsful in obtaining a patent for the new manufacture; but, like him alſo, was inadequate to the completion of it upon a profitable ſcale. Ravenſon was alſo enjoined to publiſh his diſcoveries under the title of his "Metallica," which was printed for Thomas Thorp, anno 1613. Several other adventurers ſtepped forth, all of whom had the mortification of reſigning their patents, without having contributed to the ſucceſs of their arduous undertaking.

In 1619, Dubley obtained his patent, and declared, that although he made only at the rate of three tons per week, he made it with profit.

This diſcovery was perfected at his father's works at Penſent, in Worceſterſhire. This gentleman's ſucceſs in the various manufactures of iron with pit-coal, had united not only all the proprietors in the charcoal iron trade, but many new adventurers, who wiſhed to ſhare in the emoluments, or to acquire part of the fame of the new diſcovery. Their intereſt was ſufficient to limit the duration of Dudley's patent from 31 to 14 years. During the greateſt part of this period, according to his own ſtatement, he continued to make pig and bar iron, and various caſtings; all of which he ſold much lower than the charcoal manufacturers. In the article of caſtings he muſt have had greatly the ſtart of the charcoal founderies, as the quality of melting coke pig-iron is far ſuperior to that of charcoal, particularly that made in this country for the general purpoſes of caſting. Nor was the ſuperior genius of Dudley always an object of paſſive indifference in the narrow eſtimation of the new adventurers and the eſtabliſhed manufacturers. The envy occaſioned by his uncommon ſucceſs, produced at laſt a ſpirit of combination, which terminated in a hoſtile attack upon his devoted works. His improved bellows, furnace, forge, &c. all fell a prey to a lawleſs banditti, betwixt whom and its furious leaders no ſhades of diſtinction were viſible, but thoſe of avarice, ignorance, and the moſt contemptible prejudice.

To evade the mode of operation diſcovered by Dudley, or to introduce the making of coke pig-iron with greater advantages, a new plan was adopted by captain Buck, major Wildman, and others, in the foreſt of Dean, where they erected large air-furnaces, into which they introduced clay pots reſembling thoſe uſed at glaſs houſes, filled with the neceſſary preparations of ore and charcoal. The furnaces were heated with the flame of pit-coal; and it is probable, that by tapping the pots below, it was expected that the ſeparated metal would flow out. This rude proceſs of aſſaying on a large ſcale, was in the end found utterly impracticable; the heat was inadequate to perfect ſeparation; the pots cracked; and, in a ſhort time, the proceſs was abandoned altogether.

The misfortunes which befel the ſanguine, but unfortunate Dudley, were an irreparable loſs to the perfection of the coke pig proceſs. The hoſtile rivalſhips he had to encounter in conſequence of the new ground he had occupied as a manufacturer, together with a zealous attachment to the royal cauſe during the civil war which followed his diſcovery, completely prevented his improvements from attaining a pitch of permanency and general utility. The refuſal of a new patent after the reſtoration, prevented him from again entering the laborious paths of diſcovery and improvement, although it appears, that his former application to the perfecting of this branch of manufacture had not been unſucceſsful, for in place of three tons of coke pig weekly, in his petition praying for a renewal of his ancient rights, he ſtates, that he could now manufacture ſeven tons by means of a large furnace, and an improved bellows.

No greater pitch of improvement took place for nearly one hundred years after this period. The practicability of the manufacture was diſcovered; but the mode of obtaining quantity, to enſure in general a profitable return, depended upon other circumſtances than the proportioning of the raw materials together. Had machinery received the ſame improvements in the time of Dudley, it is more than probable that the rapid progreſs of the coke pig trade would have dated its origin from that period. But this great era in the hiſtory of our manufactures was reſerved for a much later date; and in the improvements of the ſteam engine, we ſee new life and exiſtence conferred upon every ſpecies of art that can be made ſubject to motion or mechanical control.

Blast *Furnace Works*, are large and expenſive buildings for the manufacturing of pig iron. An erection upon the ſmalleſt ſcale muſt conſiſt of a furnace, caſting-houſe, bridge-houſe, and blowing engine. The latter is ſometimes, though ſeldom, worked by means of a water wheel. The moſt univerſal mode of blowing is by means of a ſteam engine. See Blowing *Machine*.

There is no general plan laid down for building a blaſt furnace work. The ſingular ſituation which ſhould be occupied, to inſure every conveniency, renders this dependent upon the nature of the ground.

It is always reckoned a great advantage to place the blowing machine at as ſhort a diſtance as poſſible from the furnace or furnaces, that the air may have the leaſt poſſible travel in the conducting pipes. When this cannot be conveniently effected, the diameter of the pipes ought to be made ſufficiently large to admit of the blaſt paſſing without any material friction.

The uſual appendages to blaſt furnaces are mines of coal, iron-ſtone, and lime-ſtone. And theſe form no inconſiderable portion of the whole expence.

In ſituations where blaſt furnace building materials are at a moderate price, and when no uncommon difficulty occurs in the progreſs of the general operations, 15000l. of ſunk capital may be deemed requiſite for one furnace; and for every furnace after this, 10,000l. may be added.

This great capital for many years kept the trade in the hands of a few; but of late, ſince capitaliſts have become more common, the number and extent of the blaſt furnace erections have become truly aſtoniſhing.

The following deſcriptions of plates illuſtrative of the plan and arrangement of blaſt furnace works will convey a tolerable idea of the nature of theſe buildings.

Plate XI. *Blaſt Furnace Works*, repreſents the ground plan of an entire fabric, conſiſting of

A ſteam-engine for blowing two furnaces.
2 Blaſt furnaces.
2 Bridge-houſes.
1 Caſting houſe.
1 Boiler-houſe.
2 Boilers.
1 Chimney for boiler flues.

A, Engine-houſe, 40 feet long, 18 feet wide.

B, Pedeſtal for ſteam cylinder: 7 feet ſquare at baſe, and 4 feet at top.

C, Pedeſtal for blowing, or air cylinder. Baſe 10 feet ſquare, top 7 feet ſquare. Theſe are generally built of ſolid hewn ſtone, and bedded with the greateſt accuracy. From centre to centre of the two pedeſtals is 24 feet, which is alſo the diſtance betwixt centre and centre of the ſteam and air cylinders.

D, Door or opening through the lever wall. This wall at bottom is built $5\frac{1}{2}$ feet thick, but is occaſionally reduced

in

in point of thickneſs to 3½ feet at top, as may be ſeen at the correſponding letter in the ſection.

F, Door or opening from the engine into the boiler-houſe. An opening above this ſerves to conduct the ſteam pipe from the boiler to the ſteam apparatus at the cylinder.

E, Door or opening for carrying through the blaſt pipes from the top and bottom of the air cylinder to the water receiver below.

G, The boiler-houſe, 40 feet by 30 within the walls. As this is excavated from the ſolid hill to the depth of 30 feet, it is requiſite to have the walls uncommonly ſtrong. Thoſe in the plan are 6 feet thick at bottom, and are reduced at three different heights in thickneſs, as repreſented by the interior lines.

HH, Two boiler-ſeats for boilers, 18 feet long, 9½ feet high, and 7 feet wide.

II, Fire-places, 6 feet ſquare.

KK, Dead plates before the bars or grates.

LL, Openings where the furnace doors are hung.

MM, Semi-circular openings formed beyond the dotted line or termination of the boiler, in which the flame from the grates riſes to enter the iron flue or tube, which is placed in the centre of the boiler.

N, Chimney, 2½ feet ſquare within, and 50 feet in total height; from the bottom of the flue 42, and 8 feet from the foundation.

OO, Coal pits for containing ſmall coals for the engine's ſupply. Theſe are 8 feet by 6 at bottom, and widen gradually as they approach the ſurface of the coke yard. The coals are there emptied from the cart into theſe receivers, and the engine-man eaſily ſupplies his wants from the ſmall openings which communicate with O into the boiler-houſe.

PP, Bridge-houſes for containing cokes, iron-ſtone, and lime-ſtone, for filling the furnace. Meaſurement within 42 by 40 feet.

QQ, Doors or entrances from the coke yard into the bridge-houſes.

RR, Openings from the bridge-houſe, which is here connected with the furnace, by means of an arch and parapet walls. This is more fully ſeen in the elevation ſection P. Along this bridge the materials are carried or wheeled into the mouth of the furnace.

SS, Two blaſt furnaces, 34 feet ſquare in the baſe.

T, Caſting-houſe 102 feet long by 48 in width from the front wall or arch of the furnace, or 88 feet wide from the front wall of the engine and bridge-houſes, and 24 feet high in the ſide walls.

W, Water receiver for receiving and equalizing the column of blaſt. Length 40 feet, and breadth 18 feet.

V, The ſpace in which the equivalent column of water riſes, 3 feet wide. The exterior line denotes the inverted iron cheſt; the interior lines, the different baſements formed by the ſtone work laid upon the cheſt to prevent it from riſing when the engine is at work.

Y, Termination of the blaſt conduct pipes from the air cylinder into the iron receiver, 2 feet 6 inches diameter.

Z, Poſition for the horizontal range of pipes to branch off, which are meant to convey the blaſt to the oppoſite tuyeres, *aa*, betwixt the back wall of the furnace, and the bridge-houſe.

bb, The two tuyere ſides next the water preſſure. From Y proceeds a ſtraight pipe along the centre line *b*, for conveying the blaſt to that ſide of the furnace.

cc, Front arches, under which the furnace workmen perform all the labour of tapping, caſting, and cleaning the furnace.

d d, The ſpaces incloſed within theſe dotted lines are called pig beds. They are kept conſtantly filled with ſand, and in them the operation of moulding and running the pig metal is conſtantly performed.

Plate XII. *Blaſt Furnace Works.*

Elevated ſection of the ground plan, *Plate* XI. through N F B D C E and X.

A, Inſide of the blaſt engine-houſe.

B, Steam cylinder pedeſtal.

C, Blowing or air cylinder pedeſtal. Both of theſe are built upon 4 or 6 inch planking, laid upon ſtrong logs, which are again ſupported upon the ſolid ſtone buildings, *a a*, running from the lower wall along the ſide wall of the engine-houſe, to the wall perpendicular to E. The binding down bolts that paſs through the flanges of the cylinders are ſtrongly keyed upon the under ſide of the logs, and are at all times eaſily acceſſible.

D, The lever wall and opening of communication betwixt the ſteam and blowing end of the engine-houſe.

F, Door or opening into the caſting houſe and water regulators.

E, Door to the boiler-houſe.

G, The boiler-houſe.

H, One of the boiler ſeats.

I, One of the boilers, 18 feet long, by 9½ wide, by 7 high.

K, Man-hole door for entering the boiler.

L, Thorough arch in the foundation of the chimney.

M, Throat, or opening into the chimney, for the paſſage of the flame and ſmoke.

O, Coal pit for containing fuel for the engine.

P, Arched paſſage of communication betwixt the bridge-houſe and furnace mouth. The opening in the bridge-houſe is more diſtinctly ſeen at R, *Plate* XI.

S, Side view of one of the blaſt furnaces, as connected with its correſponding bridge-houſe.

W, Water vault, or ciſtern, for receiving the inverted cheſt. In rocky foundations this is cut out of the rock, but in ſoft ground the excavation is made and lined with well jointed maſon work, puddled behind with clay to prevent the loſs of water.

T, Caſting-houſe and roof.

b, The tuyere arch.

c, The ſow, or lintel of caſt-iron, 12 inches ſquare.

d, The orifice at which the blaſt enters, called the tuyere.

e, Spring beams of the engine-houſe, A. Theſe are compoſed of two logs 14 inches ſquare. The main gudgeon, ſeat, and beam reſt upon theſe.

f, Stay logs for the ſteam cylinder.

g, Ditto, for the blowing cylinder.

Deſcription of *Plate* XIII. *Blaſt Furnace Works.*

Croſs ſection and elevation of *Plate* XI. through S Y S.

S S, Section of two blaſt furnaces, and their ſituation as connected with the blowing apparatus.

Y, The branch pipe for communicating the air to the inſide tuyeres of the furnace. This pipe has another branch of communication behind, which connects it to the blaſt pipes which deſcend from the blowing cylinder at A, and to the double column of pipes which are carried round behind the furnace to the oppoſite tuyeres.

C C, View of the pipes which convey the air to the oppoſite tuyere, where double blaſts are in uſe.

D, Front wall of engine and bridge-houſes.

X, Iron cheſt inverted in the water receiver, and connected with the blaſt pipes.

VV, Opening all round for the water to aſcend, as it becomes expreſſed from the cheſt by the impelling force of the blaſt.

O, Logs on which the chest is inverted, to preserve it from the floor of the water receiver, from 12 inches to 18 of space.

Description of *Plate* XIV. *Blast Furnace Works.*

Ground plan of an extensive blast furnace foundery, consisting of four furnaces and two blast engines. The peculiar construction of this plan is, that only one furnace may be erected at a time, and afterwards the whole number; still preserving that regularity and uniformity of design which will at any time make the blowing machinery of one part subservient to the whole, in case of accidents, stoppages for repairs, &c.

A, Engine-house, with cylinder, pedestals, lever wall, openings, &c.

B B, Two boiler-seats and boilers.

CC, Water regulators for the blast, which conveniently communicates, by means of pipes, with the blowing cylinders, placed upon the pedestals behind A, I.

DD, &c. Centre line of the whole blast pipes. This extensive column may be so arranged, as to enable the furnaces to be blown each with two tuyeres; and the blast of one engine made to pass through the whole. The general communication is effected by carrying the chief column either behind the furnaces, or, as in the plate, through the main pillar of the furnace, by means of an arched opening 3 feet wide.

E, Ground plan of the hearth, squares, and pillars of four blast furnaces.

FFFF, Bridge-houses for materials, and filling or charging the furnace.

GGGGG, Openings into the furnace top.

H, Casting-house.

I, Second blast-engine, upon the same plan as A. Each of these two engines ought to be calculated to blow two furnaces, and occasionally, when any thing goes wrong with one, the blast of the other could be easily distributed for a time among all the furnaces.

BLASTED, in *Antiquity*, something struck with a *blast*.

Among the Romans, places blasted with lightning were to be consecrated to Jupiter, under the name of *bidentalia*, and *putealia*. It was also a ceremonial of religion to burn blasted bodies in the fire.

BLASTING *of stones*, in *Agriculture*, the operation of tearing asunder large stones or rocks, which are in the way of the plough or other instruments employed in breaking up ground, by means of gun-powder. The method of performing this business is by boring a large hole, eight, ten, twelve, or more inches deep, according to the nature and size of the stone or rock to be blasted, by means of a chisel for the purpose, and then introducing a sufficient quantity of gunpowder, and afterwards carefully ramming the hole up with small fragments of stone or other solid materials, only leaving a very small aperture, by placing a steel pricker of sufficient length and suitable dimensions, with a handle at the top, at first into the powder, and frequently turning it round while the hole is ramming up. After the hole is quite filled, by forcing the hard materials in with a proper instrument, the pricker is withdrawn, and the aperture left by it filled to the top with gun-powder, and then a match of tow, straw, or other light inflammable material laid to it, and set on fire.

It is observed by Mr. Headrick, in the second volume of "Communications to the Board of Agriculture," that in order to perform this operation properly some experience is necessary, and that a skilful workman can frequently rend stones into three equal pieces, without causing the fragments to fly about. This, he says, depends upon the depth and position of the bore. It is also remarked, that a small portion of quick-lime, in fine powder, is found to increase the force, and consequently to diminish the expence of blasting stones. On these grounds the following is offered as a substitute for gun-powder, which is now become very expensive, though, as is freely confessed, without any experience of its effects. Supposing *fig.* 1, *Plate* III. (*Agriculture*) to be a large stone to be blasted or rent; *ab*, a bore sent down into it in the usual manner. This bore being then well cleaned out and dried, is to be filled from *b* to *c* with the purest quicklime, or such as swells most in slaking. That it may be perfectly quick it should be taken red hot from the kiln, or the small furnace where it has been burnt; being then rammed in hard with the jumper or punch *a c*, the upper part of the bore is to be crammed with rotten rock in the ordinary way. The pricker being removed leaves the aperture at *b*, *a b*, a small pipe of copper, of less diameter than the needle or pricker, having an orifice about the dimensions of the straw, used to convey the fire down to the gunpowder, with a funnel *d* to receive water, is introduced into the aperture. Perhaps a straw or small reed stuck in the lower part of the funnel, among tallow or bees wax, might serve the purpose of a copper pipe. Things being thus prepared, pour water into the funnel *d*; and if the pipe be not too high, so as to prevent the air from escaping from the aperture, left by the pricker, it will descend and cause the lime to flake in the bore *c b*. Every one knows how irresistibly the purest quick lime attracts water, and with what prodigious force it expands in slaking into three or four times its former bulk. From these data it is therefore inferred, that the slaking of lime, in such circumstances, would burst or rend the stone *f* in pieces; but the success of such an experiment, it is observed, must depend entirely upon using lime of the utmost purity, and having it very hot, and perfectly caustic when it is put in.

It is further remarked that if the bore *c b* were filled with water, and the aperture afterwards rammed up, the water being made to freeze by cold, would rend the stone; for when water passes from a fluid to a solid form, it expands with irresistible force, though frost cannot be depended upon in this climate.

BLASTOLOGY, from βλαστος, *bud*, and λεγω, *I gather*; the regular and stated pruning of vines.

BLATNA, in *Geography*, a town of Bohemia in the circle of Prachalitz, near which is an inland lake, which is the source of the river Uslava.

BLATTA, in *Middle Age Writers*, denotes a purple in the wool or silk, dyed with the liquor of the blatta.

This was otherwise denominated *blatta serica*, or *blatto sericum*: whence also *blattiarius*, used in ancient writers for a dyer in purple.

BLATTA, in *Entomology*, a genus of *hymenopterous* insects, called in England *cock-roaches*, or *black beetles*. The head is inflected; antennæ setaceous; feelers unequal and filiform; wing-cases and wings smooth, the former somewhat coriaceous; thorax flattish, orbicular, and margined; legs formed for running; abdomen terminating in two articulated appendages above the tail.

The blattæ, considered in a collective point of view, are a very troublesome race of insects. Certain kinds, that are happily for us still peculiar only to the hotter parts of the world, are so formidable both in respect of number and talents for doing mischief, that they are really considered as a pest to society in those countries which they infest. These noxious creatures enter houses and commit various depredations on the furniture, devour provisions of every kind, tear or gnaw holes in clothes, torment the inhabitants with their bite, and otherwise do considerable injury. The sort of blatta most abundant in England

England was originally a native of the eastern parts of the globe, or, as some suppose, of America, from whence it was long since imported into Europe, and is now completely naturalized to our climate. This is the *blatta orientalis* of systematic writers. Another creature of this kind, *blatta Americana*, was also introduced with the raw sugars brought some years ago to Europe from America.

All the known species of *cock-roaches*, whether in the larva, pupa, or perfect winged state, secrete themselves in the day-time, and wander about during the night in search of food. In allusion to this circumstance, the ancients called them lucifugæ, insects that shun the light. The common cock-roach will eat almost any sort of provision, preferring, however, bread, meal, sugar, and stale meat, either of which it is observed to devour with the greatest eagerness. Except in being completely destitute of wings and wing-cases the larva resembles the perfect insect, and in the pupa state nothing more than the rudiments of the wings are perceptible. In the dark they are remarkably active and brisk in all their motions, and on the least disturbance, or the return of light, retreat again to their lurking places with timidity and precipitation. They can fly swiftly, but they seldom use their wings for this purpose; even when most closely pursued they are known to trust rather to their legs, with which they are able to run with no small celerity. The fumes of charcoal, we are told, may be employed with success in destroying these unwelcome inmates.

The following species of the *blatta* genus, are described by Linnæus, Fabricius, Gmelin, &c. viz. *gigantea*, *maderæ*, *ægyptiaca*, *occidentalis*, *surinamensis*, *americana*, *australasiæ*, *erythocephala*, *capensis*, *indica*, *nivea*, *irrorata*, *viridis*, *brasiliensis*, *petiveriana*, *orientalis*, *cincta*, *picta*, *variegata*, *lapponica*, *germanica*, *ruficollis*, *maculata*, *marginata*, *oblongata*, *nitidula*, *fusca*, *deusta*, *chlorotica*, *latissima*, *aterrima*, *perspicillaris*, *asiatica*, *schæfferi*, *sylvestris*, *pennsylvanica*, *livida*, *rufa*, *grisea*, *minutissima*, *aptera*, *punctulata*, *ocellata*.

Blatta, according to some writers, was also used for a particular kind of kermes, or chermes; or, according to others, for "the purple-worm," by which the *coccus cacti*, or *cochineal* insect was most likely meant. But both of these acceptations are suspicious. We know that the word blatta was anciently used for a kind of moth, whose fat was reputed excellent for the ears. This last was called the book-worm moth. See Book-worm.

Blatta *Americana* of Catesby is of the *silpha* genus with modern entomologists. Gmelin speaks of it under the name of *Silpha Americana*.

Blatta *byzantina*, in *Physiology* and *Pharmacy*, the *operculum*, or lid of a turbinated shell, whose fish yields a purple dye.

The *blatta* differs from the lid of the *buccinum* or *purpura*, in figure; the first being oblong, the latter round: but in the shops they are ordinarily confounded, and sold for each other. The *blatta byzantina* is also confounded by apothecaries with the *unguis odoratus*, from which it ought to be distinguished, as belonging to another kind of shell-fish.

Dr. Lister takes the *blatta byzantina* to have succeeded the *unguis odoratus*, and to have been brought into the shops in its place. In Dioscorides's time, the best was brought from the Red Sea, viz. the palest and fattest; the blacker and less, from Babylon, or the Persian gulf: but it seems, latter times took up with those found about Constantinople; whence the present shop *blatta* had its name.

The name *blatta* seems to have been given to this *operculum* from the colour; as being of a dark hair-colour, as the common *blatta orientalis*, or common *cock-roach*, so frequent in London, is.

The *blatta byzantina*, when exhibited internally, renders the body soluble, softens the spleen, and discusses peccant humours. When used externally, by way of fumigation, it restores epileptic patients, and women labouring under a strangulation of the *uterus*. In other disorders its effects are the same with those of most testaceous substances.

BLATTARIA, in *Botany*. See Celsia, Lythrum, Pentapetes, and Verbascum.

BLATTERIÆ, Affinis. See Lysimachia.

BLATTINUS, in *Entomology*, a species of *staphylinus* that inhabits Austria; the colour is black; thorax broad; wing cases and the legs testaceous and glossy. Shranck. Ins.

BLATUM-Bulgium, in *Ancient Geography*, a promontory of Britain, mentioned in Antonine's Itinerary, concerning the situation of which antiquarians have entertained different opinions. Camden, Gale, Baxter, and some others, have fixed it at Boulness, on the south coast of Solway firth, at the end of Severus's wall; yet Mr. Horsley assigns its situation at Middleby in Annandale. Here, as at the most remote limit of the province of Britain, Antonine commences his second route. A military way led from Blatum-Bulgium to Luguvallium, or Carlisle.

BLAU, in *Geography*, a river of Germany, in the circle of Swabia, which rises near the foot of a hill in the Blautopse, as it is called, and runs into the Danube at Ulm.

BLAUBEUREN, a town of Germany, in the circle of Swabia and duchy of Wirtemberg, in a small district of the same name, seated on the river Blau, 7 miles W. of Ulm.

BLAUDRUSELUS, in *Zoology*, (olassen isl.) *phoca cristata* of Erxleben and Gmelin, and *hooded seal* of Pennant.

BLAUENTHAL, in *Geography*, a town of Germany, in the circle of Upper Saxony.

BLAUER-Bock, in *Zoology*, one of the names given by authors to the blue antelope, *antelope leucophæa*. Vide Kolbe Vorgeb.

BLAVET, in *Biography*, a celebrated performer on the German flute, the first, perhaps, who greatly distinguished himself by that instrument after it superseded the common flute, and became in general use. He was born at Besançon, and coming to Paris in 1723, soon acquired a great reputation. The prince of Carignen, who knew his merit, enlisted him in his service; gave him an apartment in his hotel, and a pension. He was afterwards appointed superintendant of the comte de Clermont's band, and remained in that nobleman's service to the end of his life.

To his admirable talents, Blavet joined the respectable virtues of society; his manners and conduct were blameless, his temper tranquil, and his probity scrupulous. He married at eighteen, and lived upwards of fifty years with his wife in uninterrupted harmony and affection. We are always glad when to great professional abilities, such an estimable character can be joined.

Blavet's excellence on the German flute had been heard of all over Europe, before the character of Weideman was established in England, or that of Quantz in Germany.

About the end of 1765 he was attacked with the stone, which was a malady then more dangerous than it became afterwards, by the skill, experience, and success of eminent surgeons; but determining too soon, like our poor countryman, Dr. Worgan, to submit to the operation, he died under it in 1768, leaving behind him the esteem and regret of all who knew him.

Blavet, in *Geography*, a river of France, which runs into the sea opposite Belle Isle. This forms a good harbour and spacious road.

BLAUFELCHEN, in *Ichthyology*, the name under which *Salmo Wartmanni* of Bloch and Gmelin is described by Wartmann Besch. Berl. Naturf. Fr. 3. p. 184.

BLAVIGNAC, in *Geography*, a town of France, in the department of the Lozère, and chief place of a canton in the district of St. Chely d'Apcher; 6 miles south of St. Chely.

BLAUKOEPFIGE Rothe Amsel *Frisch*, one of the synonymous names of *lanius minor*, Gmel.

BLAUMEISE, in *Ornithology* (Frisch. Hist. of Birds), the blue titmouse of English writers, and *parus cæruleus* of Linnæus.

BLAUSLUYS, in *Geography*, a town of Holland, 2 leagues west of Gertnefdenburg.

BLAUSPECHT, in *Ornithology*, the name of the common nut-hatch; *sitta Europæa* in Frisch. Hist. of Birds.

BLAYE, Blavia, or Blavutum, in *Geography*, a sea-port town of France, in the department of the Gironde, and chief place of a district of the same name seated on the Gironde, or Garonne, near its conflux with the Dordogne. Its citadel is situate on a high rock, and it is defended by a fort constructed on an island in the river, which is here 1900 toises wide; and on the other side of the river, in the country of Mendoc, is another fort. All ships that are going up the river to Bourdeaux, deposit their arms and cannon at Blaye, before they pass the river, and take them up on their return. The town contains 3580, and the canton 13,819, inhabitants. The territory comprehends 160 kiliometres, and 14 communes. It is distant 20 miles north from Bourdeaux. N. lat. 45° 9′. W. long. 0° 45′.

BLAYMARD, or Bleymard, a town of France, in the department of Lozère, and chief place of a canton, in the district of Mende. The place contains 546, and the canton 11,802, inhabitants. Its territory comprehends 347½ kiliometres, and 11 communes; 3½ leagues east of Mende.

BLAZE, in the *Manege*. See Star.

BLAZEGNIES, in *Geography*. See Malplaquet.

BLAZEY Bay, a bay in the English channel, on the south coast of Cornwall, between Foweyand Deadman point.

BLAZING Star. See Comet.

BLAZON, or Blason, in *Heraldry*. To *emblazon* is a term signifying the description of things borne in coat-armour, in such manner as they ought to be represented, according to the rules of heraldry. To *blazon*, originally signified the blowing or winding of an horn by the heralds, at justs and tournaments, when they proclaimed and recorded the atchievements of the combatants.

BLEA, *in Vegetables*, is that part of a tree, which lies immediately under the bark, and between that and the hard wood, and is the first progress of the alteration of the bark into wood by the natural growth and strengthening of the fibres. See Botany.

While the blea remains yet soft, and retains something of the nature of bark, it may maintain a feeble vegetation; but when it is grown absolutely hard and woody, it can contribute nothing to the growth of the tree. The vegetation of the young branches of trees is the most lively and vigorous, and the only one that goes as far as the flowers and fruit, because these branches are little else but bark.

BLEACHING. The art of bleaching consists in removing the coloured matters intermixed with vegetable and animal substances in their natural state, or such as they have subsequently imbibed by accident, or some artificial process. Edward Hussey Delaval, esq. F.R.S. has shewn, by a number of accurate experiments on the cause of the permanent colours of opake bodies, published in the second volume of the second edition of the Memoirs of the Literary and Philosophical Society of Manchester, "that when the colouring matter of plants is extracted from them, thesolid fibrous parts, thus divested of their covering, display that whiteness which is their distinguishing character. White paper and linen are formed of such fibrous vegetable matter, which is bleached by dissolving and detaching the heterogeneous coloured particles." He further observes, "it appears that the earth, which forms the solid substance of plants, is white; that it is separable from the colouring matter by several means; that whenever it is either pure and unmixed, or diffused through transparent colourless media, it exhibits its whiteness, and is the only vegetable matter which is endued with a reflective power; that the colours of vegetables are produced by the light reflected from this white matter, and transmitted from thence through the coloured coat or covering, which is formed on its surface by the colouring particles; that whenever the colouring matter is either discharged or divided by solution into particles, too minute to exhibit any colour, the solid earthy substance is exposed to view, and displays that whiteness, which, as before noticed, is its distinguishing character."

He states that in all those animal matters which do exhibit colours, the colouring particles are endued with the same properties, and are regulated by the same laws, which prevail in vegetable substances.

A reference to the original paper can only do justice to the observations of this excellent philosopher, confirmed by numberless experiments; but what is already said will be sufficient to give an idea of the nature of the process of bleaching, and that it depends on the removal of the matter interposed betwixt the air and this white substance.

The national importance of bleaching is so great, that it comprehends nearly the whole of the cotton and linen manufacture, and goes to an extent beyond most other arts.

Its operation in these branches may be considered under two points; viz. 1st, the separation of extraneous substances from linen and cotton, which is effected by steeping, fermentation, or weak alkaline leys; 2d, the separation of the constituent or inherent colouring matters of those substances, which is effected by different modes, and by various modifications of each method, as exposure to the air, light, the use of alkaline leys, soap, oxygenated muriatic acid, combinations of oxygenated muriatic acid with other matters, sulphuric acid, hepar sulphuris, &c.

To impress upon the mind the nature of the bleaching business, it will be proper first to describe the vessels used in the sundry operations of steeping, boiling, bucking, washing, souring, &c. then proceed to shew the management of each process, with some observations on its effects; and, lastly, how to make or procure the articles necessarily employed in this art, and the method of ascertaining the qualities of each, adding some observations on the theory of the operations.

Bleaching of goods, particularly cotton manufactures.

1st, *On Steeping*.

The vessels generally used in bleaching are made of such wood as will not communicate any colour to the liquors they are to contain, and therefore deal or fir wood is preferable to most others. The vessels employed for steeping the goods when received from the loom are usually of the form A, *fig.* 1. *Plate* I. *Bleaching*. The goods when received from the weaver contain not only the natural colouring matter of the cotton, which is of an oily nature, and which prevents the cloth from easily imbibing water, but also a substance called sowins, being a paste made of flour and water, used during the weaving, and applied with brushes upon the warp, in order to give a firmness to the threads by glueing

or pasting together the loose fibres of the threads, and thus allowing them to pass more freely through the reed and harness. To remove this substance, and to open the fibres of the cotton, so as to give full effect to the subsequent operations, it is proper to steep the goods in a vessel of the above form in lukewarm water, till a gentle fermentation takes place, which will usually be effected in 24 hours. The cloth should then be taken out, and well washed in a current of clear water, which will thus separate a considerable quantity of filth without the expence of using alkaline leys; and the cloth is then ready to be boiled or bucked as may be preferred by the bleacher.

2d, *On Boiling.*

For boiling, a copper vessel is to be preferred, and the goods prepared, as above mentioned, by steeping and washing, are put into the vessel containing hot water only, or warm alkaline ley; a winch is placed over the vessel, and the piece goods attached to the ends of each other, are, when put in motion by the handle of the winch, dragged or rolled over it till the whole are passed; the winch is then turned with a retrograde motion, and the cloth gradually thus returned back, in order that every part of each piece may be thoroughly impregnated with the liquor, which is raised to and kept at a boiling heat, as long as it appears to extract any colouring matter from the cloth; the goods are then taken out and well washed in water.

Fig. 1. *Plate* IV. shews a section of the boiling pan A, of copper, set in brickwork B; the winch C, with its handle D; E, uprights of wood, on which the winch turns; F, a cock to empty the pan; G, the fire-place; H, the ash-hole.

The use of this process depends upon the properties which alkaline salts have of uniting with the oily and resinous matters which are either attached to or are a constituent part of vegetable fibres, and which contain their colouring particles, forming with them a saponaceous matter, soluble in water, and by that means easily extricated from the cloth.

3d, *On Bucking.*

As this is one of the most general operations in bleaching, it will be necessary to describe it more particularly. *Fig.* 1. *Plate* I. under the word *bucking*, shews at A the form of the bucking tub or kier, in which the goods are to be laid; B is an iron boiler, in which the alkaline salts, as pot-ashes or pearl-ashes, are to be dissolved in boiling water; C is the fire-place, in which a fire is constantly kept up; D is the ash-hole; E, a cock through which the boiling ley is let out upon the goods closely placed together in the bucking tub, A. A sufficient quantity of boiling ley is let into the bucking tub, till all the goods in the tub are thoroughly impregnated with it; the ley liquor is then allowed to pass by a cock at H into an iron vessel placed in the ground at F, and from thence raised by the pump G into the iron boiler B, and thence returned hot again upon the cloth. This operation is continued for several hours, till the ley, by the separation of the colouring matter in the cloth, acquires a colour almost black, a very offensive smell, and nearly the consistence of molasses or treacle. The cloth is then taken out, well washed from its impurities, and, in the old mode of bleaching, it is then laid upon the ground to be whitened by exposure to the atmosphere, but, in the new mode of bleaching, is submitted to the action of the oxygenated muriatic acid, to procure a similar whiteness. It may be proper here to notice, that the old and new methods of bleaching are yet much the same as formerly, only in the substitution of the use of the oxygenated muriatic acid in those parts of the process, where a long exposure to the atmosphere was formerly employed after the alkaline leys.

The operation of bucking acts on a similar principle to that of boiling, but in a much more forcible manner, as a greater quantity of ashes is added in proportion to the water made use of, and more heat is received and retained in the large bulk of cloth placed in the bucking tub, which expands the fibres of the cotton, and admits the more powerful action of the alkali, as is easily demonstrated by observing the very dark colour of the alkaline leys which have been used in bucking, in comparison with those which have been employed in boiling goods. To those persons who wish for a full and minute account of the absorption and power of heat, we recommend a perusal of count Rumford's interesting essays on the subject of heat.

The black alkaline ley which remains after bucking should be preserved, as it will answer, after evaporating and calcining, as hereafter mentioned, to form again fresh alkaline salts of good quality. With a view to preserve as much of the ley as possible, it will be adviseable to wring it out into a tub from the cloth or yarn, after it is bucked, by the method shewn in *Plate* IV. *fig.* 3. where R R are two strong posts, fixed firm in the ground, S T two wringing hooks, upon which the cloth U is twisted, to force out the liquor, by W, a winch handle, which turns the hook round on the post R. The two hooks are kept at a proper distance from each other, one by a collar at X, the other by an iron pin at Y, which runs through a hole in the square part belonging to the hook T, which square has several holes in it to bring this hook nearer to the hook S when required.

4th, *Souring.*

This process consists in immersing, for the space of twelve hours, or more, the yarn or cotton in a mixture of water and sulphuric acid (vitriolic acid), well incorporated; the proper strength of which mixture is about the acidity of lemon juice, and is usually directed by the taste. The sour kettle should be made of lead, of a form which can be heated; the heat of the liquor should not be greater than the hand can bear with ease. This sour kettle should be half sunk within the ground, as shewn in *Plate* IV. *fig.* 2. where M is a section of the souring vessel; N, the level of the ground; O, the brickwork; P, the fire-place, which is a half circle, or arch, without any grate; I I I, a space filled with dry ashes, betwixt the lower part of the sour vessel and the brick-work, in order to preserve the heat of the liquor in that part of the vessel below the surface of the ground; K, a brick hearth, on which part of the fire is made: L, a cast iron plate, bending in the form of the sour kettle, which is intended to prevent the fire placed on the floor at P K, from acting upon the lead of the sour vessel; Q, the space betwixt the vessel and brick-work, through which the smoke goes to the chimney.

The construction of this apparatus is upon the same principle as the warm vats made use of by the blue dyers, the intent not being to make the liquor boil, but to keep it at a degree of heat which the hand can long and easily bear. There are no grate or bars necessary in this fire-place as the coals will burn with sufficient rapidity without them.

The goods may be put into this acid liquor either in a wet or dry state. The best plan is to immerse the goods in the evening in the acid liquor cold, let them remain covered with it all night, then in the morning make a fire and bring the liquor to a blood heat, in which state having a winch over the vessel, similar to that represented at C, *fig.* 1. give the goods a few turns over it, that every part of them may be exposed to the action of the liquor. The goods may then be lapped round the winch to drain a little, to prevent an unnecessary waste of the acid liquor, and afterwards carried to the wash-wheel, or river, to be well washed from

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the acid, so that the cloth may be perfectly tasteless to the tongue. It is a remarkable circumstance, that cloth may remain immersed a very considerable time in a strong acid liquor without rotting, but that if exposed to the air or heat of a stove, if a very small portion of acidity remains in the cloth, it becomes so concentrated by heat, as to damage the cloth immediately; therefore too much attention cannot be paid to this point.

The use of the acid liquor above-mentioned is to dissolve any earthy or metallic matters inherent in the cloth, or which may have been communicated to it accidentally, or which it may have derived from the impurity of the alkaline salts used in the bucking or boiling.

A considerable quantity of the acid liquor may be preserved by passing the goods which have been soured through a tub of clean cold water, previous to washing them, and replenishing the sour kettle with this acidulated liquor, rather than water only.

5th, *Washing.*

After every operation in which acids or alkaline substances are used in bleaching, it is necessary that the goods should be well washed in clear water; it is therefore of the greatest consequence that the water of a bleach ground should be pure, and in considerable quantities, such, for instance, as is perfectly transparent, will not curdle with soap, nor yield any degree of blackness with powdered gall nuts, or, which is a more accurate test, with a tincture of galls by infusion in spirits of wine.

Various methods have been invented for the purpose of washing out the impurities of the articles to be bleached; such as cleansing them in a large current of water by shaking them with the hand in the stream, beating them on blocks of wood with a flat paddle, or hand brush, beating them on a large flat stone with long wooden levers, flatted underneath, passing them over winches placed above vessels of water, or rivers, as *fig.* 1. and 3. *Plate* II. passing them betwixt plain or fluted rollers, as *fig.* 5. and 6. putting them under fulling mills, or fulling stocks, as *fig.* 7. or within wash-wheels, as *fig.* 1. and 2. and by many other modes, few of which are equal, and perhaps none superior, to those of which engravings are here given, for doing the business simply, effectually, and with ease to the workmen; the latter point of which is of consequence to be attended to, as it will be universally found in every mechanical employment, that if the least additional labour or care is required from the workmen, however great the effects produced, prejudice or indolence will prevent their doing justice to the invention. Under these circumstances, the wash-wheel represented in *Plate* II. *fig.* 1, 3, 4, is the best machine for general use, and the least liable to occasion damage to the goods. The front of the wash-wheel represented at A, *fig.* 1. is supposed to be eight feet diameter, exclusive of the buckets B, shewn by dotted lines on its periphery, which give it motion from the water falling into them. This wheel is divided within into four parts or quarters, by the strong arms projecting from the shafts D, to the outer circle; in each of these separate quarters or boxes, represented by dotted lines, one or more pieces of goods which require washing, are put loosely folded together through one of the holes C, of 14 inches diameter.

Fig. 2. shews the back part of the said wash-wheel, which is made of solid planks, excepting a grate of slender iron bars marked R, which encircles the wheel underneath the separation boards or bottoms of the buckets; the use of this grating is to admit within the wheel a current of clear water from the pipe Q. When an equal number of piece goods have been introduced into each of the four divisions of the wheel by the holes, C, &c. above mentioned, a current of clear water is permitted to run through a cock from the pipe Q, against the grating R, which allows it to flow freely through into the boxes, or those parts of the wheel which contain the goods; a valve is then opened from the trough P, communicating with a large reservoir or stream of water, a sufficient quantity of which is let into the outside buckets from the valve, to give the proper motion to the wash-wheel containing the goods. In every revolution of the wheel, the goods in each quarter of it are thrown twice, by the simple motion of the wheel, with great force against the arms which form the four divisions of it; viz. once in going down, and once in rising up. The ear can distinguish by the firmness of the sound when the wheel moves with proper velocity; and a greater or less quantity of water is allowed to act upon the buckets till that is attained, which usually is when the wheel makes 15 or 16 revolutions in a minute. During the whole time the wheel is in motion, the stream of clear water from the pipe Q flows upon the goods within the wheel in every direction; and the dirty water, produced from thus washing the goods, runs out of the wheels from a number of holes bored through the wood-work near the axle, and a few made in the front near the outer circle of the wheel. *Fig.* 4. shews an end view of the wash-wheel, about thirty inches wide, with the manner that the bucket-work is made.

It has been found to answer equally well to make use of a greater number of wash-wheels of a smaller size, as six feet diameter and two feet wide, of which several may be put in motion at once by a large water-wheel, horses, or a steam engine.

The goods, when taken out of the wash-wheel, are to be unfolded, and taken to the river to be streamed, or may be washed from any impurities which may remain in the folds by means of a winch N, *fig.* 1. and 3. *Plate* II. where six pieces of cloth are represented in the action of washing in a large wooden back divided into six partitions, to prevent the pieces of goods entangling with each other. *Fig.* 1. is a side view of the operation, where the dotted lines represent the partitions which separate the goods; I, a trundle wheel, which being put in motion by the cogs, H, of the wash-wheel, turns the winch on its axle, which winch may at any time be detached from it by the handle M drawing the catch K from the hook, as is shewn in the top view *fig.* 3. where also is explained, at the letters OOOOOO, the manner in which each piece of goods is kept in its proper place on the winch, by the partitions above mentioned, and by angular slips of wood nailed to the back and partitions.

To assist the drying of the goods after washing, they are usually passed betwixt two small rollers, commonly called squeezers, represented at *fig.* 5, where G is a solid wooden frame, containing two wooden rollers, each from 10 to 16 inches long, on an iron axis, which rollers receive a proper pressure by means of the two screws T acting on an iron bar V, which rests on the two ends of the axis of the top roller, as shewn by the dotted lines. In proportion as the screws press the iron bar upon the axle of the top roller, it brings that roller closer in contact with the bottom roller, and occasions more water to be pressed out of the cloth, which is passed betwixt them loosely drawn together, something like a rope, and the goods therefore require less time in the subsequent drying. In this plate the squeezers are connected with the wash-wheel above mentioned by a square iron socket, which, as is shewn at F, slides occasionally upon the squares of both axles. *Fig.* 4. shews at S the buckets of the wash-wheel, on which the water falls to give it motion; H, the cogs round its axle, which work the trundle wheel I.

Fig. 6. *Plate* II. shews two views of another machine used for cleansing cotton goods, consisting of two fluted or grooved

grooved rollers, in the ſection of which *a* repreſents the ſills, or bottom timbers; *b b*, the two ſupports or ſide pieces; *c*, one of the upright pieces in which the axles of the rollers are placed; *d d*, the two croſs pieces to ſecure the frame work below; *e e*, the two rollers with grooved channels which fit to each other; *h*, one of the levers, which, from a point *i*, ſhewn by dotted lines, preſſes on the round end of the axle of the top roller, more or leſs, according as the weight *k* is placed on the lever further from or nearer to the axis of the roller.

In the geometrical elevation of the ſame machine, *ee* ſhews a front view of the two rollers; *fg*, the winch to turn it, with a hollow wood handle upon the iron work; *l*, the axis of the upper roller projecting beyond the ſide timber, ſo as to admit one of the levers *h* above mentioned to preſs upon it.

The wet goods, by being paſſed backwards and forwards through theſe fluted rollers, which are conſtructed at a much leſs expence than waſh-wheels, are conſiderably cleanſed, but not ſo perfectly as by the waſh-wheels above mentioned.

Fig. 7. *Plate* II. explains another mode of cleanſing goods, and is applicable to cotton, linen, or woollen goods, but more generally to the two laſt, as, without great care in its management, it is very apt to tear or damage cotton goods. This machinery is uſually termed falling ſtocks, or falling hammers. N° 1. is the axle of the water-wheel, in which are fixed tappets at 2, to raiſe alternately the levers 3, 4, furniſhed with large wooden mallets or hammer heads 6, 8, channelled at the lower part as at 8. Theſe lever hammers or fallers, work from a pin fixed in the upright at 7; 9 is a ſtrong piece of timber hollowed out at 10, to receive the goods to be cleanſed; 11, a piece of timber fixed a-ſlant to keep the fallers in their proper place, and direct their motion; 12, a chain faſtened to each faller, ſerving by means of the hook 13, to ſuſpend the faller whilſt the goods are put in or taken out of the cavity 10.

When the goods to be cleanſed are placed in a looſe bundle in this cavity, the hammers are let down upon them, and put in motion alternately by the tappets 2, in rotation, which raiſe the levers to a certain height, and then quitting them, the hammer heads by their great weight, fall with great force on the goods in the cavity below them; and a current of clear water being admitted upon the goods from a cock above them, the dirty water runs out at a hole in the bottom of the cavity. The falling of the hammers gives a ſlow circular motion to the goods in the cavity, ſo as to expoſe the ſeveral parts in rotation to the action of the hammers.

Having noticed the veſſels made uſe of in bleaching, and the general nature of the ſeveral operations, we ſhall now proceed to mention the origin of the ſeveral improvements made in this art, and their application to practice.

Under the operation of ſteeping, we have ſhewn the method of removing the colouring matters not natural to the vegetable, but acquired in the manufacture, and which may probably be beſt done by water alone, though ſometimes ſome of the old leys, which have been previouſly uſed to other cloth, are employed to this purpoſe. After the ſteeping, and indeed after every application of bleaching agents, it ſhould be laid down as a general rule, that the cloth or goods be carefully waſhed in cold water.

In the old method of bleaching, alkalies, ſuch as pearl or pot-aſhes, were, after ſteeping, applied by bucking or boiling, with alternate expoſure to the atmoſphere.

Alkalies acting ſo important a part, it is neceſſary to deſcribe the bleachers' mode of uſing them, which conſiſts in diſſolving them in clean water, and thus forming what is termed an aſh-ley. To which the more intelligent bleacher, if he does not make uſe of American pot-aſh, or that of a ſimilar quality, adds $\frac{1}{3}$ of quicklime, whereby the aſhes are rendered cauſtic, and their power materially augmented. But in order that no inconvenience may ariſe from cauſticiey, after mixture, the whole is allowed to ſettle, and from the pure liquor thereof the work is afterwards ſupplied; the bleacher, in drawing it off, reducing it by the addition of water to the different ſtrengths which the goods may require.

The ley being prepared, the bleacher proceeds to apply it to the cloth by bucking or by boiling.

In bucking, the alkaline ley is put into the boiler before deſcribed, near to and below which is the wooden veſſel called a kier, in which the goods are looſely and regularly arranged. After this, a fire is put under the boiler, and beginning whilſt the ley is yet cold, it is made to circulate through the cloth in the kier, from which it runs into the iron veſſel placed in the ground, from this it is pumped up into the boiler, and again returned upon the cloth in the kier; and this circulation is maintained, and the heat at the ſame time increaſed, until the ley be ſo far concentrated by evaporation, as at laſt to remain almoſt wholly in the cloth. This is generally the operation of a day, and the cloth is allowed afterwards to remain thus impregnated with the concentrated ley until next morning.

In boiling in alkaline leys, the mode of which has been before deſcribed, the operation is continued from one hour to five or ſix hours, but it is more tedious and leſs effectual than bucking, where much buſineſs is to be done.

After bucking or boiling, the goods were, by the old bleaching proceſs, expoſed for at leaſt a week to the air, before they were again ſubmitted to the action of alkaline leys, and this proceſs alternately repeated many times, till the goods were perfectly white, and the goods at laſt ſoured and waſhed off.

To explain the *old method of bleaching* more particularly, we ſhall add the following proceſs for bleaching linen cloth.

Steep your raw linen cloth in a wood veſſel all night, then change the water, and add freſh till you perceive the water to be no longer diſcoloured by it; rinſe, wring, and lay it on the ground, and water it if you have opportunity. When it has thus lain on the graſs three or four days, and is dry, take hold of each piece one after the other by the ſelvedge, and draw the cloth to you, ſtill holding it in the moſt even manner you can, until you get the further end, with the corners of which further end you tie the cloth very looſely in the middle of the folds, and ſo lay it in the bucking tub, with the two ſelvedges upwards.

Thus proceed till you have placed as much cloth in your tub as will cover the bottom of it, taking care not to pack the cloth ſo cloſe but that your ley may penetrate every part equally. When you have laid the firſt range of cloth in your tub, pour upon it as much milk-warm ley as will ſufficiently ſoak through all parts of your cloth. Then lay another range in the ſame manner upon the firſt, and pour on more ley till that be ſoaked as the other was, and continue ſo to do till your bucking tub be full of cloth.

That done, you muſt begin to buck for twelve hours together, the remainder of your ley having been put in the pan with a ſlow fire underneath. For the firſt five hours the ley ſhould not be of a boiling heat; you muſt from time to time allow ſome of the ley to run out of the pan upon the cloth in the bucking tub; then increaſe your fire gradually and ſlowly, ſo as in four hours more to bring it to a boil, continuing to put on the ley, and draw it off your cloth in ſmall quantities at a time. When your ley begins to boil, you muſt let it boil on for three hours, during the whole

time

time pumping your ley up to the boiler from the reservoir, into which it runs from the cloth, and returning it boiling hot upon the cloth, so that the hot ley may act powerfully and equally upon every part thereof.

After each bucking your cloth must be laid upon the grass in the bleach-field for some days. The bucking, and exposure on the ground, must be repeated about ten times successively, according to the nature of your cloth; it should then be dried up, soured, and washed well in clean water; if the water is rather warm, the better.

Your two first buckings ought to be from a strong caustic ley of pot-ashes; but afterwatds you should abate of that strength, lest it should injure your cloth. Mild ley, or pearl-ash, should be used for the latter buckings, as the cloth becomes nearer white.

This was the management during the summer months; but for four months in winter bleaching was suspended, the operations being periodically interrupted, and the capital of the manufacturers or proprietors of the goods locked up. Even during the bleaching months, their property was long in preparing for sale; as cotton goods, which required from four to six applications or repetitions of alkaline leys, consumed so many weeks in bleaching, whilst linens, which could not be bleached by less than from twelve to twenty applications, could not be brought in a marketable state to the proprietor hardly in six months.

Such was the state of bleaching till Mr. Scheele, a Swede and eminent chemist, discovered the properties of oxygenated muriatic acid, procured by mixing manganese with marine acid, in rendering vegetable matter white; and M. Berthollet, the celebrated French chemist, improved this operation, and actually applied its powers in bleaching cotton goods by interposing its action between the different alkaline operations instead of the tedious exposure of the goods to an uncertain atmosphere; the same effect being produced by immersion of the cloth in this acid, as by laying the goods upon the grass in the bleach-field, exposed to air and light.

Discovery of and Variations in the Mode of procuring the Oxygenated Muriatic Acid.

By the addition of vitriolic acid to common salt, an elastic aeriform fluid, or muriatic gas, is disengaged, from which with water a marine acid is produced. The mineral substance manganese, or what the modern chemists call oxyd of manganese, contains what was formerly denominated vital air, pure air, or dephlogisticated air, but now named oxygen. Manganese yields oxygen, when marine acid is added to it, and submitted to distillation; the liquor produced by the contact of this oxygen with water, is the oxygenated marine or muriatic acid discovered by Mr. Scheele, about the year 1774, when he observed and applied its effects in rendering colourless vegetable substances of various kinds, more as a matter of curiosity than use.

M. Berthollet, in the year 1786, improved the process of its preparation, applied its power to bleaching or destroying the vegetable colours natural to cloth, the result of which experiments he gave to the world in the year 1789; but, without derogating from the merit of this excellent chemist, it is justice to state, that, previous to any publication by M. Berthollet, Mr. Scheele communicated to M. Kirwan the properties of the dephlogisticated marine acid in whitening vegetable substances, and Mr. Kirwan, then residing in Newman-street, London, suggested to Mr. C. Taylor, the present secretary to the Society of Arts, &c. the probability of its use in bleaching; and a whole piece of callico, in the state received from the loom, was, in the spring of 1788, actually bleached white, printed in permanent colours, and produced in the Manchester market ready for sale, having undergone all these operations in less than 48 hours, by the joint efforts of Mr. Cooper, Mr. Baker, and Mr. Taylor, which is perhaps the first entire piece, either in France or England, that fully ascertained the real merits of the new mode of bleaching, and a certainty that it might be generally useful in commerce. This experiment was immediately followed by the establishment of a large bleaching concern by Mr. Cooper, Mr. Baker, and Mr. Horridge, at Raikes, near Bolton, in Lancashire, and before any considerable bleaching work was actually at work in France.

The ingenious Mr. Watt we believe to be the first person who simplified the process of preparing the oxygenated muriatic acid, by means of a mixture of common salt and manganese, previous to the addition of the vitriolic acid. Soon afterwards the operations of the bleacher were farther facilitated by the substitution of large and commodious stills of lead, instead of glass vessels, and both these improvements have since been in general use.

We shall now proceed to mark the various treatment of the oxygenated muriatic acid when obtained, and the different means which have been adopted to fit it for application in bleaching.

It having been found in the earlier stages of distillation, that common marine acid was produced instead of the dephlogisticated or oxygenated muriatic acid; and from the violence of the ebullition, that manganese itself was sometimes thrown over from the still, M. Berthollet had recourse to an intermediate vessel, containing water, to absorb the marine acid gas, and stop other impurities which might contaminate the oxygenated muriatic gas in its passage through this vessel to the receiver.

It will here be necessary to discriminate the various modes in which the oxygenated muriatic gas has been treated, after passing the intermediate vessel last mentioned.

Mr. Scheele seems generally to have operated with the acid in the state of gas; but M. Berthollet sought to condense it in water, with which he filled his receiver, or wooden vessel, and which water he kept agitated during the distillation, to accelerate the solution or combination of the gas.

The oxygenated muriatic acid, thus prepared, was drawn from the receiver into kiers, or large wooden vessels, where its strength was regulated by the addition of water; after which, the goods to be bleached were immersed therein from six to twelve hours, but most frequently during the night; and though these periods may seem short, they were sufficient to allow the cloth to become more white than could be done by as many days' exposure to the atmosphere and a summer's sun, and were then ready for a fresh application of the alkaline leys.

Such was the bleaching liquor of M. Berthollet; but it was found in practice yet defective, as the volatility of the gas occasioned its speedy separation from the aqueous solution; a decomposition even by light alone in glass vessels took place; a rapid loss in the strength of the liquor when exposed; and much danger to the health of the workmen from its suffocating quality; at the same time, that in extracting the natural colours of the cloth, it also tended to discharge the colours dyed in the yarn, and were along with the gray cotton an imperfection which precluded its use in an infinite variety of British manufactures.

Similar circumstances probably led some bleachers resident at Javelle, in France, to add a solution of caustic alkali to the water in the receiver, and by this means to remedy many of the defects complained of.

But M. Berthollet continued to recommend his process, considering such substance as impairing the bleaching powers;

an idea that was generally maintained by the chemiſts, but contradicted by the bleachers, whoſe experience taught them, that though the acid thus combined whitened with ſomewhat leſs rapidity, yet it was not eventually in an inferior extent; and the advantages of preſerving the colours dyed in the yarn, compelled them to have recourſe to the expenſive addition of pot-aſhes, in preference to M. Berthollet's mode.

Here we ſhall obſerve, that, according to the doctrine of the modern chemiſts, the oxygenated muriatic acid bleaches in conſequence of yielding to the colouring matter of the cloth that oxygen which, in the diſtillation, the acid abſorbed from the manganeſe; or, in the language of Stahl and Becher, that the dephlogiſticated marine acid abſorbed the colouring matter from the cloth, and was reſtored to its original ſtate of common marine acid, by regaining that phlogiſton which it had, in its preparation, yielded to the manganeſe.

In the mixture of an alkali with the acid, we have noticed that the bad conſequences ariſing from its volatility have been corrected, and the requiſite protection afforded to dyed colours, yet ſtill that its power of whitening cloth was not diminiſhed, nor much more time taken up by the operation; yet, in part from deference to M. Berthollet's opinion, and in part owing to the expence of the alkali, other means to produce the effect were attempted.

One of the firſt of theſe, practiſed by the bleachers of cotton-hoſe, at Nottingham, was to receive the dephlogiſticated muriatic gas into a ſmall air-tight chamber, in the upper part of which the goods were ſuſpended from a frame, whilſt at ſome diſtance below was water, ſometimes impregnated with ley of pot-aſh, and ſometimes with lime-water, or water mixed with lime. The gas was introduced betwixt the fluid and the goods, amongſt which it aſcended and mixed; at the ſame time, by occaſionally immerſing the goods in the fluid below, it was ſought to modify the action of the acid. This was effected by means of a pole, or long lever, connected with the frame on which the goods were ſuſpended, the centre of which pole moved on a ſwivel fixed in a hole in the partition, occaſionally ſtopped with clay, and enabled a perſon to let the goods down into the fluid, not always however without inconvenience, which occaſioned it the name of the *Bedlam Proceſs*.

Reſpecting the above proceſs it muſt be obſerved, that the acid is much more powerful or active in the ſtate of gas than in any other way; and though the occaſional immerſion of the goods into the fluid below, corrected in ſome degree its violent effects, yet the dyed colours diſappeared more rapidly in this than in any other proceſs, and the fabric itſelf was ſometimes injured.

The next proceſs attempted by the bleachers, was to put into the receiver, filled with water, a quantity of pulverized lime, then the goods themſelves, and the whole agitated during the admiſſion of the gas; the conſequence of which was, that the goods thus mixed with lime were partially coated with it; and this coating being unequal, the action of the acid upon it was irregular, leaving at the ſame time the parts uncoated to receive the whole action of the bleaching powers; hence inequality of bleaching enſued, and an inſurmountable difficulty in preſerving the dyed colours of the goods to be bleached.

Having noticed the imperfections of the two laſt proceſſes, we ſhall obſerve that lime-water, or a pure chemical ſolution of lime in water, has been ſometimes ſubſtituted inſtead of a ſolution of alkalies in the receiver, but was not, when uſed in that manner, found to anſwer ſo well as the alkaline ſolution.

That lime-water could produce no valuable effect beyond what was derived from M. Berthollet's mode, or from ſimple water, muſt be evident, when it is conſidered that water can diſſolve no more than $\frac{1}{700}$th part of its weight of lime, a quantity wholly inſignificant in neutralizing the oxygenated muriatic acid for the purpoſe of the bleacher; nor could pulverized lime, merely thrown into the water of the receiver, ſerve a better purpoſe, ſince, from its being ſpecifically heavier than the water, all beyond the quantity in chemical ſolution ſubſided and remained nearly uſeleſs at the bottom of the receiver.

It has been already mentioned, in noticing the application of alkaline leys in bleaching, that the more intelligent bleachers, in preparing their aſh-leys, made uſe of quicklime to augment the power of the alkali, when ſuch alkali was in a mild ſtate, or, in other words, combined with fixed air, or, as it is now termed, carbonic acid; the attraction of cauſtic lime for the carbonic acid being ſtronger than that of aſhes. Hence, on cauſtic lime being thrown into mild aſh-ley, the carbonic acid, by which the aſhes were rendered mild, abandons the alkali to combine with the lime, leaving the aſhes in their cauſtic ſtate.

But, although the attraction of carbonic acid is ſtronger for lime than for alkali, the contrary is the caſe with the oxygenated muriatic acid, as it abandons lime to combine with aſhes, leaving the lime to precipitate.

This obſervation is made in order to guard the ignorant bleacher from miſtakes, who, from having mixed lime with his aſh-ley in the receiver, in the preparation of the oxygenated marine acid, may ſuppoſe it acts in a ſimilar manner; but not a particle of lime is acted upon by the acid, whilſt aſhes remain to combine with it; the only effect of the lime there, being to abſtract from the aſhes any fixed air they may contain, and ſo diſpoſe the alkali to abſorb more of the oxygenated muriatic acid.

Beſides the proceſſes above mentioned, the bleachers attempted to unite the oxygenated muriatic acid with clay; but as the clay has ſcarcely any affinity with it, the liquor thus made was little, if at all, ſuperior to that of M. Berthollet.

Such were the attempts made from the year 1786; and the oxygenated muriatic acid combined with pot-aſh was in general uſe by the bleacher until 1798, when Mr. Tennant, of Glaſgow, by a well conducted ſeries of experiments, formed what may not improperly be called a new era in bleaching.

Mr. Tennant, having ſeen ſo long a period elapſe without any material improvement in bleaching, and the alkali, though an expenſive ingredient, regarded by the bleacher as an indiſpenſible article to unite with the oxygenated muriatic acid in the receiver, made ſome trials with the earths ſtrontites and barytes, and with ſucceſs. Their ſolubility in water enabled him to combine them with a ſufficient quantity of oxygenated muriatic acid to ſerve the purpoſe: but the ſcarcity of ſtroptites, and the difficulty of ſeparating barytes from the vitriolic acid, with which it is uſually found in combination, rendered theſe diſcoveries rather objects of curioſity than uſe.

Mr. Tennant had previouſly made experiments to combine the oxygenated muriatic acid with lime and lime-water, in the modes above-mentioned, but found they were not adequate to the purpoſes intended; the lime in general remaining at the bottom of the receiver uncombined with the gas, which was the neceſſary conſequence of the lime being ſpecifically heavier than the water, and the gas much lighter; the water, by its interpoſition betwixt the two ſubſtances which ought to be combined, namely the oxygenated muriatic gas and the lime, preventing their union. To bring the pulverized lime into contact with the gas as quickly as it

it entered the receiver, became then the object of his attention; and for this purpose he found it was necessary to keep the lime floating, or diffused through the fluid, which he succeeded in accomplishing by two different methods; one of which was by increasing the specific gravity of the water in the receiver, by the addition of common salt, and thus retarding the lime from subsiding; the other mode was by constant agitation of the lime in the water in the receiver, to keep the lime diffused through the fluid, during the time the oxygenated muriatic gas was introduced; and by this means he succeeded in uniting and retaining a much greater quantity of gas with the mixture, than by any method heretofore used, and without the addition of any ashes or alkaline substances.

A very material advantage was gained by this discovery; namely, that it uniformly afforded security to the dyed colours in a superior degree to the alkaline ley.

It is well known, that in the alkali of commerce, such as pot-ash or pearl-ash, a large and very irregular proportion of neutral salts is intermixed, which are soluble along with the alkali in water, thereby so far contaminating the ley, that the bleacher is always uncertain what quantity of pure and active alkali it contains. In bucking or boiling cotton goods, the detriment from these neutral salts is not so great, as a repetition of the process may compensate for those admixtures in the ley: but in the bleaching liquor formed by the mixture of the oxygenated muriatic gas with such ley, if there is a deficiency of alkali, the uncombined oxymuriatic acid immediately attacks the dyed colours of the goods, and discharges them, and thus considerable damage frequently occurs before the real origin of the evil is ascertained and corrected. The bleacher is kept in a constant state of alarm respecting the quality of the ashes he makes use of, besides the great cost of their purchase. In using lime for the same purpose, the expence is a mere trifle; what is not combined with the oxymuriatic acid precipitates, after the agitation is over, leaving a pure liquor free from all uncombined acid.

Simple as the combination of the lime with the oxygenated muriatic acid may now appear, yet it was a long time attempted in vain; but this, perhaps, will not be such a matter of surprize, when we reflect that the French chemists, whose opinions were regarded generally as law by the common bleachers, and whose treatises on the subject of bleaching were almost the only accounts published, considered lime as no farther useful in bleaching, than in absorbing the carbonic acid or fixed air usually combined with alkalies or ashes; and thus rendering the alkaline ley more disposed to unite with the oxygenated muriatic gas, when exposed to its contact in the receiver, to form, as it is called, the liquor de Javelle; or when intended for use as a mere alkaline ley, to render its action more powerful on the oily particles in the vegetable fibre, on a similar principle to the formation of soap.

An excellent treatise on the subject of bleaching, in the English language, viz. "The Report on Experiments made by order of the right honourable the trustees of the linen and hempen manufactures to ascertain the comparative merits of specimens of oxygenated muriatic bleaching liquids," published at Dublin in the year 1791, in claim of a bounty offered by the trustees, appears to convey no further knowledge of the use of lime in bleaching at that time than in promoting the separation of the carbonic acid from the leys, whether they were afterwards to be used alone, or in the preparation of the oxygenated muriatic acid. Mr. Rose's experiments in this report contain, however, much useful information, which we shall further notice.

The simplicity of Mr. Tennant's invention of retaining a greater quantity of the oxygenated muriatic gas, by agitation of a sufficiency of lime in the water of the receiver, should be no derogation to its real merit. In substituting lime for pot-ash, an article, not only of foreign produce, but expensive, he has benefited this country, to an extent almost beyond conception; it having been proved upon oath, that by the use of Mr. Tennant's process, the consumption of ashes at a single bleaching-green has been reduced three thousand pounds sterling in value in one year. A patent for Mr. Tennant's invention was granted him in the year 1798; but as frequently happens in patent causes, on a late trial of its validity, some circumstances arose from which the jury thought themselves justified in reversing the patent; we have therefore with considerable pains collected for the public benefit an account of his process, and the most approved mode of putting it in practice, either on a small or an extensive scale, as will be seen by a reference to *Plate* I. of *Bleaching* hereafter described.

Mr. Tennant's method of using calcareous earth for neutralizing the muriatic acid gas, and forming the oxy-muriat of lime employed in bleaching is as follows; viz.—In a receiver capable of containing one hundred and forty gallons wine measure, dissolve thirty pounds of common salt, which appear useful only in giving an additional degree of specific gravity to the water, and by that means making it easier to keep the lime to be afterwards added, in suspension; when this salt is dissolved, add sixty pounds of finely powdered quicklime, and into the retort of the apparatus put thirty pounds of powdered manganese, mixed up with thirty pounds of common salt, upon which pour thirty pounds of sulphuric acid (oil of vitriol), previously diluted with its bulk of water, and the usual precaution of luting the vessel being taken, proceed to distillation. When the gas begins to appear, the agitation of the lime and water in the receiver must commence, which should be continued by means of a wooden paddle or rake, or similar contrivance, without intermission, until the materials in the retort, after heat being employed as usual, will not yield any more oxygenated muriatic acid gas. Then the whole should be allowed to remain at rest for two or three hours, when the clear liquor in the receiver, may be drawn off for use, and mixed with water in such proportions as may be found necessary, previous to the immersion of the goods to be bleached.

The principal point of attention in preparing this oxygenated muriat of lime is, to obtain a complete diffusion of the lime through the mixture, or a mechanical suspension of it in the water during the operation, so that every particle of the lime may, by agitation, be exposed to the action of the gas, instead of merely its upper surface, as had been formerly practised. By the present means, the oxygenated muriatic acid gas is absorbed with ease, and meets with a sufficient quantity of lime to produce a strong solution of oxygenated muriat of lime, without any uncombined oxygenated muriatic acid; a thing which could not be otherwise effected. The addition of the common salt in the receiver may even be omitted, without prejudice, if the agitation of the lime be well managed.

Plate I. *fig.* 2. of *Bleaching*, shews a longitudinal section of a method, which has been practised in Ireland for distillation of the oxygenated muriatic acid, and the formation of the oxygenated muriat of lime. *a*, the ash-hole; *b*, the fire under the iron pot or vessel; *c*, the aperture through which it is supplied with coals; *d*, the entrance to the ash-hole, which may be provided with a stopper of burnt clay, or earthen ware, to regulate the draught of the fire, by means of the handle shewn by dotted lines: *e*, a cast-iron pot or vessel,

veſſel, nearly filled with water, in which the leaden retort is placed; *f*, a tripod of iron, on which the retort ſtands; *g g*, the leaden retort, from which the gas is to be diſtilled; *h*, a tunnel of bent lead, though which the oil of vitriol (ſulphuric acid) is to be introduced into the retort; *i*, a leaden cover, fitted and luted to the neck of the retort, having three apertures, viz. for the introduction of the tunnel, the rod of the agitator, and the tube of the condenſer; *k*, the agitator, formed of a rod of iron coated with lead, having ſome arms at its lower end to ſtir the materials within the retort. At the part where the rod paſſes through the cover, a leaden collar or cap is ſoldered, to prevent the agitator from deſcending too low; theſe two parts are made in a conical form, to fit exactly, and thus prevent the eſcape of the gas; *l*, a leaden tube or pipe, of three inches bore, to conduct the gas into the tubulated reſervoir; *m*, the leaden reſervoir, formed upon the principle of Wolfe's apparatus; the tube, *l*, deſcends by the firſt aperture, *m*, to the bottom of the reſervoir, which is about two thirds full of water. The ſmall portion of ſulphuric acid, which riſes in diſtillation, unites with this water; the oxygenated muriatic acid, which traverſes this water, paſſes by the pipe, *n*, into the receiver or condenſer, *o o*, which is a wooden veſſel, in the midſt of which is placed an agitator, *p*, the arms of which raking up the lime cauſe it to combine with the gas, in proportion as it ariſes in bubbles from the lower extremity of the leaden pipe, *n*.

The projections of wood, *qqqq*, fixed to the ſtaves within the tub, counteract the rotatory motion of the arms of the agitator, and thus aſſiſt the combination of the gas with the lime and water. The cover of this tub is fixed cloſe upon the edge of it at *r*; the cover having a groove in it to unite them tighter together; *s*, a cock to draw off the liquor, when ſufficiently impregnated for uſe; *t*, a wooden handle to give motion to the agitator. The joints may be luted with clay, to prevent the eſcape of the gas.

Fig. 3, and 4, ſhew Mr. Tennant's improved machinery for preparing the oxy-muriat of lime. The outline, A, (*fig.* 3.) is the ſtill, made of lead, of a circular form, having a double flange at the top, which is filled with water, to prevent the gas from eſcaping in that direction. B, the leaden cover of the ſtill, having a flange on the under ſide, which goes into the double flange of the ſtill, and having a double flange on the upper ſide, which is filled with water; the inner part of this double flange conſiſts of a ſhort tube, which goes quite through the cover, opening by this means a communication with the ſtill, and allowing the gas to eſcape through the long leaden pipe inſerted into it, and from thence into the receiver, as explained at *fig.* 4, where there is a ſection of the ſtill, furnace, and receiver; *a*, the ſtill; *b*, an iron pan in which the ſtill is placed on an iron ſtand; this pan is then nearly filled with water; *c*, the fire-place; *b*, the furnace door; *e*, the aſh-hole; *f*, double flange filled with water; *g*, the cover, with flanges on the upper ſide filled with water. D, the receiver, made of wood, and lined with lead; *i*, a double flange filled with water, the interior pipe communicating with the inſide of the receiver, and bent horizontally as at *k*, from whence the gas iſſues into the receiver; *l*, *l*, two ſhort pipes inſerted in the top of the receiver, through which the rods of the agitators have a free motion; *m*, *m*, a ſtopper in the top of the receiver, cloſed when the receiver is at work, but ſufficiently large, if removed, to admit a perſon into the inſide to repair or cleanſe it, when neceſſary; *n*, *n*, two paddles, or agitators, generally of a ſquare form, and of a ſimilar conſtruction to the head of a churn ſtaff; *o*, *o*, the rods of the agitators attached by iron pins to the lever, *q*, which lever has ſlits at the place of junction, to allow the rods to riſe and fall perpendicularly; *p*, the fulcrum or ſupport of the lever; *q*, the lever, which, by a proper motion communicated to it, alternately raiſes and depreſſes the agitators in the receiver; *r*, a rod connecting the lever *q*, with the lever *s*, which laſt lever is put in motion by the wheel E; *t*, a balance weight placed at the other end of the lever; the beam ſupporting the fulcrum of the lever being near the letter *s*. E, the wheel to be put in motion by water, or in any other way, having a crank, *u*, communicating by an upright ſhaft with the lever *s*.

It will be found that the flanges, filled with water, preclude the neceſſity of the application of any lute, and occaſion the operation to be conducted in a cleaner, cheaper, and more expeditious mode, than formerly employed.

To deſcribe the proportions of the ſeveral articles uſed in the proceſs of bleaching, would carry us far beyond the bounds which can be allotted in the preſent publication; we ſhall, therefore, give the following ſhort but clear account of the mode we recommend to be practiſed, to procure the moſt perfect and durable white on cotton goods, after their being taken from the weaver; which is, firſt, to wet them thoroughly in cold water; then to allow them to ſteep in cold, or lukewarm water, from 12 to 36 hours, according as they are of a ſtrong or thin fabric; then to waſh them well in clean cold water; afterwards to buck or boil them in a cauſtic alkaline ley; then to waſh the goods well in clean water, and afterwards immerſe them in diluted oxymuriate of lime, and waſh them, repeating the operations of the alkaline leys, and the oxymuriate of lime, till the goods are perfectly white; then to paſs the goods through the diluted ſulphuric acid liquor, waſhing them well afterwards; laſtly, to paſs them through a weak ley of pearl-aſhes, or of ſoap, and again through clean water, before drying and finiſhing them; which finiſhing of the goods conſiſts in ſtarching, blueing, rolling, or callendering them as faſhion directs, or the particular market for which they are intended, may require.

It is to be remarked, that the immerſion of the goods in the vitriolic ſours, and alſo in pearl-aſh, or ſoap liquor, is neceſſary at the end of the proceſs, to prevent a brown hue which the cloths that are bleached white from the oxygenated muriatic acid, without ſuch precaution, are apt to revert to.

By experiments made at Rouen on cotton thread, with a view to aſcertain whether the old or new mode of bleaching was more prejudicial to the fabric, it was proved that the cotton thread bleached in the new mode bore, without breaking, conſiderably more weight than that bleached in the old method, and was leſs injured in texture.

In the report on experiments, made by order of the truſtees of the linen and hempen manufactures at Dublin, in the year 1791, with a view to aſcertain the comparative merits of ſeveral ſpecimens of bleaching liquids ſent for their examination, the following mode of bleaching appeared to be the beſt for linens, and though executed on a ſmall ſcale, will convey the principal neceſſary information.

May 11th, 1791. The linen was ſteeped, in the ſtate received from the loom, into water of a heat ſufficient to bear the hand, and left in the veſſel.

May 16th. The linen was waſhed out of the liquor, in which a pretty ſtrong fermentation was obſerved to have taken place.

May 17th. Finiſhed making a mother-ley, which was made in the following manner: three pounds and a half of lime were ſlaked, and mixed with ten gallons of water; fourteen pounds of Dantzic pearl-aſh were diſſolved in ſome of this water; then mixed the whole; when it had ſettled, it

was filtered through a coarſe cloth, and the reſiduum waſhed repeatedly in four gallons of water, to obtain the whole ſtrength of the alkali; the whole fourteen gallons being then carefully mixed, the ley proved, by very accurate weighing, to contain twelve ounces of cauſtic alkaline ſalt to the gallon. From this, a ley was made from the work, by adding ſix parts of water to one of the mother-ley; thus each gallon of the working ley contained one ounce, five drachms, and forty-three grains of cauſtic alkali.

The boiler being charged with this ley, the linen, which had been ſpittle waſhed, was ſteeped in it cold for one hour; then brought up by a very gentle heat to a ſimmering boil, which was continued for three hours; the cloth was then well waſhed out, and left in ſteep for that night.

May 18th. Waſhed out the above linen in freſh water; hung it on cards in the open air, watering it ſeveral times in the day.

May 19th. Finding the cloth not ſo well cleared as could be wiſhed, the boiler was again charged with one of mother-ley, to four of water, which made the ſtrength two ounces, three drachms, twelve grains of cauſtic alkali to the gallon. In this was boiled another piece of linen which had been ſpittle waſhed as the others; and after it was boiled, it was well waſhed out.

May 20th. Steeped the whole of the linens for ſix hours in the liquid prepared with the oxymuriatic acid of the ſeveral claimants; afterwards waſhed them well out, and left them ſteeping in cold water all night.

May 21ſt. Waſhed out all the above linens, and when dry, boiled the whole parcel as before in one of the mother-leys, to five of water, containing two ounces of cauſtic alkaline ſalt to the gallon; waſhed them well out of the ley, and left them to ſteep in pure water till Monday morning, the 23d inſtant.

May 24th. Steeped the linens for the ſecond time in the oxygenated muriatic acid for ſix hours; then waſhed them out, and left them to ſteep all night in cold water.

May 25th. Having charged the copper with a ley made from one of mother-ley, to ſix of water, containing one ounce, five drachms, and forty-three grains of cauſtic alkaline ſalt to the gallon, the linens were boiled in this for the third time, with a very gentle ſimmering heat for three hours; they were then waſhed out, and left to ſteep.

May 27th. Steeped all the linens for the third time ſix hours in oxygenated muriatic acid as before; waſhed them out, and left them in water all night.

May 28th. Immerſed all the linens which had been ſteeped yeſterday in the oxygenated muriatic acid, in a weak vitriolic acid for four hours; then waſhed them out, and left them ſteeping in cold water.

May 29th. Waſhed and dried the linen cloth which had been ſoured yeſterday.

June 1ſt. Boiled all the linen which had been ſoured in a ſtrong lather of ſoap.

June 2d. Soured and waſhed out all the linen which had been boiled in a ſoap lather yeſterday. This operation finiſhed that experiment, in which the above linens were firſt ſteeped in water; then boiled in cauſtic alkaline ley, and ſteeped in oxygenated muriatic acid alternately four times; then ſoured in vitriolic acid, ſoaped and ſoured again.

The above experiments were made, with various others, by Mr. John Arbuthnot, and Mr. John Clarke; and on the trials of the different ſpecimens of the oxygenated muriatic acid, the preference was given to that prepared by Mr. Robert Roe, of Bing's End, on the principle of the javelle liquor mentioned by Mr. Bartholles, by adding a ſolution of alkali in water in the receiver. Mr. Roe's beſt preparation, of which was made by adding thirty-eight pounds of quicklime to 114lb. of pearl-aſh, which made a cauſtic ley of about nine pounds weight per gallon; he found cauſtic ley more ſuſceptible of imbibing the gas and retaining it, than mild ley of equal ſtrength.

From the different experiments made to bleach various articles at the above time, the following inferences may be deduced, viz. that allowing cotton or linen, when raw from the loom, to ferment, by ſteeping in warm water a conſiderable time before boiling the cloth in an alkaline ley, is of conſiderable ſervice.

That cloth or yarn is not injured by ſteeping for ſix hours together in oxygenated muriatic acid.

That ſtrong alkaline leys anſwer better than weak ones, at the commencement of uſing the leys.

That the white colour of bleached cloth can be better judged of wet than when dry.

That very minute attention in excluding light and air is not abſolutely neceſſary in bleaching with oxygenated muriatic acid.

That purging or clearing yarn or cloth in an alkaline ley, previous to ſteeping in oxygenated muriatic acid, is abſolutely neceſſary.

That the bleaching liquids made from oxygenated muriatic acid, in which alkaline ſalt is blended in the compoſition, require the cloth to be frequently ſteeped in vitriolic acid; and that the oxygenated muriatic acid made with water only, make more frequent boilings of the cloth in alkaline leys neceſſary.

That the loſs of the cloth in weight, when bleached by the new method, is only one fourth, but by the old method one third.

That ſteeping in warm water is infinitely better to extract the ſowen and dirt from the raw cloths, than boiling them with ſoap or ley immediately as they come from the loom.

The liquors of the oxygenated muriatic acid, and alſo thoſe made from the vitriolic acid, may be repeatedly uſed without detriment, till the whole ſtrength is exhauſted.

The cloth or linen, in the acid bleaching liquors, ſhould be moved in the liquor every hour, that every part may be equally cleared.

It is difficult to aſcertain the ſtrength of the leys proper for uſe in bleaching cotton or linen, as the alkalies or aſhes differ ſo greatly in purity, and the admixture generally found in them of neutral ſalts prevents the hydrometer from being a regular teſt. The common allowance for bleaching linens in Ireland, is ſtated by Mr. Higgins, in his ingenious memoir in the Tranſactions of the Dublin Society, to be for ſixty gallons of water, ſix pounds of barilla, or four pounds of pot-aſh at the leaſt, and moſt bleachers uſe more than this.

To diſcover adulterated pot-aſh, Mr. Higgins recommends the following method. The ſpecimen of aſhes being firſt weighed, is digeſted for a few minutes on a ſand-bath, in twice its weight of water, in a heat of about 212 degrees, and inſtantly ſtirred. It is then removed from the ſand-bath, and before it is cooled to the temperature of the atmoſphere, it muſt be filtered through paper. When all the liquor has paſſed through the filter, a ſmall quantity of cold water is gradually poured upon the ſaline reſiduum or the filter, in order to waſh through the whole of the alkali. The undiſſolved ſalt ſulphate of pot-aſh (vitriolated tartar,) remaining on the filter, is afterwards dried and weighed, to aſcertain the quantity.

To determine whether any common ſalt is ſuſpended in the liquor which has been filtered, evaporate the clear ſolution a little on a ſand-bath, and ſet it in a cold place for 24 hours

hours; at the end of which time, any common ſalt it contains will be found cryſtallized in regular cubes at the bottom of the veſſel; pour off the clear liquor, and repeat the proceſs, till no more cubic cryſtals are produced. If it is deſired to be very accurate in the analyſis, before the common ſalt (muriate of ſoda) thus procured is weighed, ſome muriatic acid may be poured upon it, in order to take up any of the pure pot-aſh which may have adhered during its cryſtallization. The muriatic acid, with ſuch of the alkali as it has diſſolved, may be then drained off and thrown away, and the muriate of ſoda dried and weighed.

The ſum of the impurities being then ſubtracted from the weight of the ſpecimen, the quantity of the pure pot-aſh is aſcertained.

To ſhewn what quantity of mere alkali is contained in 100lb. avoirdupois of ſeveral different alkaline ſalts examined by Mr. Kirwan, we ſhall add the following table, publiſhed by him in the Iriſh Tranſactions, in 1789.

One hundred Pounds.		Mineral Alkali.
Cryſtallized ſoda	yielded	20lbs.
Sweet Barilla		24
Mealy's cunnamara kelp		3.437
Do. deſulphurated by fixed air		4.457
Strangford kelp		1.25
One hundred Pounds.		**Vegetable Alkali.**
Dantzic pearl-aſh	yielded	63.33lbs.
Clarke's refined aſh		26.875
Caſhup		19.176
Common raw Iriſh weed-aſh		1.666
Do. ſlightly calcined		4.666

It is much to be regretted that, conſidering the immenſe quantities of pure marine alkali which could be procured at a cheap rate from the Eaſt Indies, ſo little attention ſhould be paid by the Eaſt India company to an article which would be ſo profitable a branch of commerce to them, and prevent a conſiderable ſum being paid to other nations. The mineral alkali procured from the Eaſt Indies, is much purer than what is obtained from Barilla; and a preparation exactly ſimilar in appearance and quality to the Alicant Barilla, may be made with great advantage to the manufacturer, from a mixture of the Eaſt India mineral alkali with the common Scotch kelp, for the purpoſes of the bleacher, the ſoap-maker, or the Turkey-red dyer. To ſhew the importance of this object, the following table of the imports into Great Britain are annexed for ſeven years.

	Barilla.	Pot-Aſhes.	Pearl-Aſhes.
1796	86.723 cwt.	62.829 cwt.	45.290 cwt.
1797	51.105	57.826	36.674
1798	123.990	81.482	60.691
1799	146.163	77.246	51.792
1800	175.629	135.4[illegible]0	45.161
1801	63.210	90.523	54.835
1802	151.796	48.054	64.288

When it is conſidered that 20 pounds of the mineral alkali brought from India in a powdery ſtate, as it uſually is, will, by mere ſolution in water, yield 100lbs. of the cryſtallized ſoda ſold in the ſhops, it will be ſeen, that the purchaſe of the mineral alkali from the Eaſt India company, will be an object well deſerving the attention of the bleachers and ſoap-boilers; and far preferable to the uſe of Spaniſh kelp or Barilla.

Mr. Kirwan, by means of muriatic acid, precipitated the colouring matter from an alkaline ley, ſaturated with the colouring matter of linen yarn, and found it to poſſeſs the following properties. When ſuffered to dry for ſome time on a filter, it aſſumed a dark green colour, and felt ſomewhat clammy, like moiſt clay. His obſervations in the Iriſh Tranſactions for 1789, are as follow:

"I took, ſays he, a ſmall portion of it, and added to it 60 times its weight of boiling water, but not a particle of it was diſſolved. The remainder I dried in a ſand-heat; it then aſſumed a ſhining black colour; became more brittle, but internally remained of a greeniſh yellow, and weighed one ounce and a half."

"By treating eight quarts more of the ſaturated ley in the ſame manner, I obtained a further quantity of the greeniſh depoſit, on which I made the following experiments:

1ſt. Having digeſted a portion of it in rectified ſpirits of wine, it communicated to it a reddiſh hue, and was, in a great meaſure, diſſolved, but by the effuſion of diſtilled water, the ſolution became milky, and a white depoſit was gradually formed; the black matter diſſolved in the ſame manner.

2d. Neither the green nor the black matter was ſoluble in oil of turpentine or linſeed oil, by a long continued digeſtion.

3d. The black matter being placed on a red-hot iron, burned with a yellow flame and black ſmoke, leaving a coaly reſiduum.

4th. The green matter being put into the vitriolic, marine and nitrous acids, communicated a browniſh tinge to the two former, and a greeniſh to the latter, but did not ſeem at all diminiſhed.

"Hence, it appears, that the matter extracted by alkalies from linen yarn, is a peculiar ſort of reſin, different from pure reſins only by its inſolubility in eſſential oils, and in this reſpect reſembling lacs. I now proceeded to examine the powers of the different alkalies on this ſubſtance, eight grains of it being digeſted in a ſolution of cryſtalized mineral alkali, ſaturated in the temperature of 62°, inſtantly communicated to the ſolution a dark brown colour; two meaſures (each of which would contain eleven pennyweights of water), did not entirely diſſolve this ſubſtance. Two meaſures of the mild vegetable alkali diſſolved the whole."

"One meaſure of cauſtic mineral alkali, whoſe ſpecific gravity was 1.053, diſſolved nearly the whole, leaving only a white reſiduum."

"One meaſure of cauſtic vegetable alkali, whoſe ſpecific gravity was 1.039, diſſolved the whole."

"One meaſure of liver of ſulphur, whoſe ſpecific gravity was 1.170, diſſolved the whole."

"One meaſure of cauſtic volatile alkali diſſolved alſo a portion of this matter."

The colouring matter of cotton is much more ſoluble in alkali, than that of linen: hence the greater facility with which cotton is bleached.

The theory of bleaching vegetable matter, as we have before obſerved to have been deſcribed by Mr. Delaval, depends on removing the colouring matters, whether natural or accidental, which cover their ſolid fibrous parts, which are the only parts endued with a reflective power.

Raw cotton or linen, boiled in a diluted ſolution of cauſtic alkali, gives to the liquor a deep brown colour, and deſtroys its cauſticity; and freſh portions of clear ley applied a ſecond or third time, will produce a ſimilar effect, but in an inferior degree. If the cotton or linen be now plunged into the oxymuriatic acid, and allowed to remain a ſhort time, they will become white; and if they are then plunged into an alkaline ley, the liquor will again become brown, and loſe its cauſticity.

On ſaturating either the firſt or laſt of the alkaline ſolutions with an acid, a ſimilar precipitate is obtained from each, of a dark coloured matter, almoſt inſoluble in water, but ſoluble in cauſtic alkali.

Hence

Hence it appears, that after raw cotton or linen has been acted upon by alkalies for two or three times, they have no further effect upon it, till the cloth comes in contact with oxygen or pure air, either by immerſion in the oxygenated muriatic acid, or by expoſure to the atmoſphere; and it is on account of the ſpeedy action of the acid, in compariſon with that of the atmoſphere, that the new mode of bleaching is now generally adopted.

M. Berthollet, and the modern chemiſts ſuppoſe, that the colouring matter of linen is compoſed principally of carbon and hydrogen; and they conclude, that linen, bleached by the oxymuriatic acid, becomes yellow on this principle, that when the oxymuriatic acid renders linen white, a quantity of oxygen has combined with the colouring particles; but that this oxygen gradually enters into a combination with the hydrogen, and forms water which paſſes off; that then the carbon becomes predominant, and the linen, in conſequence, aſſumes a yellow colour.

The old chemiſts, on the principles of Stahl, would ſay, that a part of the dephlogiſticated marine acid, (oxymuriatic acid,) after the cloth had been acted upon by the alkali, abſorbed ſuch phlogiſtic colouring matter from the cloth, as the alkali had no affinity for; and thus became diluted common marine acid, which has a great attraction to cotton or linen, and, if expoſed to a moderate heat, will act upon the texture of the cloth, and render it of a yellow colour.

We notice this circumſtance in two different points of view, that the bleacher may be aware of the neceſſity of applying, in either caſe, a weak ley of pearl-aſh, ultimately after the uſe of the muriatic acid, to prevent this yellowneſs from occurring; and alſo that the reader may comprehend the reaſoning of Home, and other perſons who have written upon the ſubject of bleaching, previously to Mr. Scheele's diſcovery.

To recover the pure alkali from the black coloured leys, which have been uſed in bleaching, and to render them equally proper for the ſame purpoſe, has been for a conſiderable time a material object in the neighbourhood of Manchester, and practiſed with great ſucceſs.

To effect this, the black or brown ſtrong leys, which have been left after bucking linen, or cotton yarn, or goods, or ſaved after wringing them, is put into an oblong flat ſhallow iron pan, made of plate iron, rivetted together. (See *Plate* IV. *fig.* 4, 5.) Under this pan a fire is made, and the old leys gradually evaporated, till they become of a conſiſtence nearly reſembling tar; the matter is then put into caſks, and carried to the reverberatory furnace, *Plate* IV. *fig.* 6, 7. where it is laded or poured into the cavity or bed within the furnace; the fire being then made, acts powerfully on the alkaline maſs; gradually dries the water left amongſt it; then acts on the colouring matter the ley has abſtracted from the cloth, which is partly diſſipated in a black, offenſive ſmoke, and partly deſtroyed by combuſtion; the calcination of the aſhes is aſſiſted from time to time, by raking them up with a long iron rod, in order to expoſe freſh ſurfaces to the flame; the heat is continued and increaſed till the inflammable matter amongſt the alkali is diſſipated, and the aſhes brought to a perfect fluid ſtate; they are then let out by an aperture in the ſide of the furnace, into an old iron pot put into the ground, and when cold, broken into ſmall pieces for uſe, being frequently in a purer ſtate than when firſt imported.

Fig. 4. *Plate* IV. is a ſection of the evaporating pan for the waſte leys, where A repreſents a flat iron pan, of an oblong ſquare form, about ſix inches deep, and of a ſize proportionate to the quantity of leys to be evaporated; B, the fire-place; C, the aſh-hole: D, the flue in which the fire acts under the pan; E. the chimney for the ſmoke; F, the brick work.

Fig. 5. *Plate* IV. is a bird's eye view of the ſame evaporating pan, which is made of plates of beaten iron rivetted together, as ſhewn in the plan; the fire-place underneath it is marked by dotted lines at B, and the chimney flue at E.

Fig. 6. *Plate* IV. repreſents a longitudinal ſection of the reverberatory furnace uſed in the preparation of aſhes, or ſolid alkaline ſalts from the old leys after evaporation, to a proper conſiſtence; *a* the brick work; *b*, the aſh-hole; *c*, a channel, or paſſage under the furnace, to admit a free current of air; *d*, the fire-grate; *e*, the fire-place; *f*, the inner part of the furnace; *g*, the bed of fire proof brick, on which the matter is calcined; *h*, the alkaline ley to be calcined; *i*, a door through which the ley is introduced by an iron ladle into the furnace, and through which door the matter, during calcination, is ſtirred from time to time; *k*, the paſſage for the ſmoke, or chimney, which chimney ſhould be from 20 to 30 feet high; *l*, the upper part of the furnace, arched like an oven; *p*, the ſeparation wall between the fire and matter to be fluxed or calcined.

Fig. 7. *Plate* IV. repreſents the upper plan of the furnace, of which *fig.* 6. is a ſection; *a*, the outer walls; *b*, the aſh-hole and draught-hole; *e*, the iron grate of the fire-place; *g*, the baſon in which the leys are calcined; *m*, the door through which foſſil coal is thrown into the fire-place; *n*, an iron tube through which the aſhes in fuſion flow out of the furnace when ſufficiently calcined; *o*, an iron pot into which the melted aſhes flow, and where they are ſuffered to cool; *p*, a wall of fire-brick between the fire-place and baſon, over which wall the fire paſſes; *r*, the ſteps leading down to the aſh-hole.

It is neceſſary to remark, that all the interior part of the reverberatory furnace ſhould be made of Welſh brick, or ſuch as will withſtand the action of a ſtrong fire; the whole building ſhould be well bound together by iron bars, or cramps. If ſo conſtructed, it will laſt for ſeveral years; and when it then wants repair, the aſhes, which will be found accumulated in the interſtices of the brick-work, will defray the expence of ſuch repairs.

Having ſhewn the methods generally uſed in bleaching linen and cotton, we ſhall notice a proceſs lately diſcovered by Mr. W. Higgins of Dublin, for uſing the ſulphuret of lime, as a ſubſtitute for pot-aſh in bleaching. The ſulphuret is prepared in the manner following, viz. ſulphur or brimſtone in fine powder, four pounds; lime well ſlaked and ſifted, twenty pounds; water ſixteen gallons; theſe are all to be well mixed, and boiled for about half an hour in an iron veſſel, ſtirring them briſkly from time to time. Soon after the agitation of boiling is over, the ſolution of ſulphuret of lime clears, and may be drawn off free from the precipitate, which is conſiderable, and which reſts upon the bottom of the boiler. The liquor, in this ſtate, is nearly of the colour of ſmall beer, but not quite ſo tranſparent.

Sixteen gallons of water are afterwards to be poured upon the remaining precipitate in the boiler, in order to ſeparate the whole of the ſulphuret from it; the matter is then well agitated, and muſt, when ſettled, be drawn off, and mixed with the firſt liquor; to theſe again thirty-three gallons more of water may be added, which reduce the liquor to a proper ſtandard for ſteeping the cloth.

Though either lime or ſulphur, ſeparately, is very little ſoluble in water, yet this ſulphuret of lime is highly ſoluble.

This preparation has been applied, in the following manner, to the bleaching of linen in Ireland.

The linen, as it comes from the loom, is charged with the weaver's paste or dressing, to discharge which, the linen must be steeped in water for about 48 hours, and afterwards taken out and well washed; in order to separate the resinous matter inherent in the vegetable fibre, the linen must then be steeped in the cold solution of sulphuret of lime (prepared as above), for about 12 or 18 hours; then taken out and well washed; when dry, it is to be steeped in the oxymuriate of lime, prepared by Mr. Tennant's process, for 12 or 14 hours, and then washed and dried. This process is to be repeated by six alternate immersions in each liquor, which are sufficient to whiten the linen.

Though we must confess, that we have some doubts respecting the application of sulphuret of lime to supersede the use of ashes, in bleaching goods intended to remain perfectly white, yet we think it incumbent upon us to state, that for goods previously bleached for dyeing, it possesses advantages over those where alkalies have been used, and which has been actually proved above 30 years ago, by the practice of Mr. Peter Henry Ottersen, communicated by him to the late Mr. John Wilson, of Ainsworth, near Manchester. Mr. Wilson's memory deserves every mark of respect from the cotton manufacturers of England, for his numerous improvements in the bleaching, dyeing, and finishing of cotton goods.

For the use of private families, where the linen is dirtied by perspiration or grease, it will be of great service towards rendering it white, to steep it for some time in a clear liquor, made by mixing one quart of quicklime in ten gallons of water, letting the mixture stand 24 hours, and then using the clear water drawn from the lime. After the linen has been steeped in this liquor, it should be washed as usual, but will require much less soap to be used.

Cotton goods, after bleaching, were formerly dried in the open air, on frames or tenter-rails, or on rails in covered buildings, or in large rooms or stoves heated for the purpose, all which modes were attended with great delay and disadvantages.

These difficulties were removed in 1797 by an apparatus, simple in its construction, easily managed, and of singular use in facilitating the process of the bleacher. For this useful invention the public are indebted to John Burns, esq. of Paisley.

By this discovery the bleacher can erect a drying machine, equally useful at all seasons, and in all weathers, at less than one-tenth of the expence of former constructions, for doing business to the same extent. There is no risk of damage from wind or rain, less chance of injury from servants, owing to the simple manner in which the goods are prepared. They receive a fine gloss during the process of drying, the colour is as well preserved as if dried in the open air, and they cannot be injured by the heat.

A contrivance so obviously beneficial and complete, was soon introduced into general practice in the west of Scotland; and so undoubted were the claims of the above gentleman to the originality of invention, that the bleachers in the neighbourhood presented him with a handsome donation of silver plate, suitably inscribed, in testimony of their sense of his merit, and as some reward for communicating his plan to the public.

We are more particular in noticing this circumstance, as some other persons have subsequently taken out a patent for the same principle, with a little variation in the construction of the machine, but which alteration has not been found to answer the purpose as expected. We shall therefore now more particularly describe Mr. Burns's apparatus for drying.

Fig. 1. *Plate* III. A is the boiler or steam vessel; B, the safety valve; C, the hollow leaden pipe which conveys the steam from the boiler to the rollers; D, a brass cock hollowed to receive the pivot of the roller, represented in *fig.* 2, one of which cocks is fixed to the pipe under each roller, and by opening which the steam is admitted into the roller; E represents twelve rollers placed upon the cocks, one of which, next to D, has the cloth upon it in the operation of drying; FFF, the wood frame in which the machinery is placed; GGG, the supporters of the leaden steam-pipe, and of the trough HH, which trough is 15 inches broad at top, to receive the water formed by the condensed steam as it drops from the bottom of the rollers, E, and to conduct it to I, a small pipe extending from the trough, H, to the funnel, K, which funnel has its lower pipe reaching to within eight inches of the bottom of the boiler, to prevent the steam from issuing out at its mouth, and which funnel keeps the boiler supplied with water to its proper height, or shews when any is wanted, as the steam would arise through it if water should be wanting in the boiler.

Fig. 2. *Plate* III. shews one of the rollers separate from the frame. It is usually five feet long, one foot in diameter, and made of double tinned sheet iron, and hollow in the middle, for containing the steam; *a* is the lower pivot of the roller, which is an open tube at the end for receiving the steam conveyed through it from the cock. This pivot rises a foot within the roller, at the under part of the roller; at *d* is a small hole for allowing the condensed steam to drop into the trough placed below it as above-mentioned; *b*, the other pivot or axis of the roller, which is fastened to the top bar of the frame by a latch, as represented in *fig.* 1.; *c*. a row of teeth fixed into a small slip of tinned sheet iron, soldered to the roller, and thereby elevated to prevent the teeth from tearing the cloth.

Fig. 3. *Plate* III. a machine about three feet in height, for the purpose of lapping the cloth upon the rollers. A, the box in which the cloth is first laid; B, the farthest wooden roller, over which the cloth passes from A, and from thence under the wooden roller C, to the tin roller D, on which it is lapped by turning it with the handle E; F, the cloth passing under the roller C, to the tin roller D, on which, when it is lapped, it is ready to be carried and placed in the drying machine; G, a weight hung from the projection in the frame at H, over the roller B, to keep the cloth sufficiently tight as it passes from the box A, over that roller to be lapped on the drying roller D.

Fig. 4. *Plate* III. shews another method of lapping the cloth on the tin roller, previous to its being dried. A, a perpendicular frame, in the front of which is placed the tin roller B, with a handle for turning it at C; the cloth D extends from the roller B over the wooden roller E, in a frame F to G, where its other end is attached by a wire run across it to some wrapper or linen cloth, fastened to a board H, fixed below the roller B. LL are upright posts fixed to the outer side of the bottom frame KK, having wooden pegs NN in them, on the side nearest the tin roller B. Rails or rods are laid across from these to similar pegs opposite, to prevent the cloth touching the ground when it is adjusting in the beginning of the operation, and the number of these posts necessary, therefore, are in proportion to the length of the cloth.

At the commencement of lapping the cloth on the tin roller B, the frame F, moveable on small rollers II, running in grooves on the frame KK, is drawn so far back, that when the cloth is fastened to the wrapper G, one half of the piece reaches to the roller F, the other half passed over that roller, reaches to the tin roller B, to which it is then to be fastened. On turning the handle C, the cloth is gradually lapped round

the

the roller B, the moveable frame F being drawn forward by the cloth; for as the cloth is lapped on the roller B, the frame F is drawn towards it betwixt the uprights L L, and by means of a projecting wood forming an inclined plane fixed at M, on each ſide, near the top of the frame F, the rails O are raiſed off the pegs NN, and carried forward on the part M of the frame F, without impeding its progreſs to the tin roller B, till the wrapper G, to which the cloth is faſtened, paſſes over the roller, and the wire at G, which attaches it to the cloth, is withdrawn, leaving the whole of the cloth to be dried on the tin roller B, which roller is then taken out and placed in the drying frame.

To aſcertain the ſtrength of the oxygenated muriatic acid uſed by the bleachers in France, Monſ. Deſeroizilles made uſe of a ſolution of indigo in the vitriolic acid, for which purpoſe he takes one part of finely pulverized Guatimala indigo, and eight parts of concentrated vitriolic acid, which mixture ſhould be put in a glaſs veſſel, and kept of a gentle heat by ſtanding near the fire or in warm water all night, and repeatedly ſtirred with a glaſs rod or tube. When the ſolution is complete, it is diluted with a thouſand parts of water. One meaſure of this ſolution is put into a graduated tube of glaſs, and oxygenated liquor is added, until the colour of the indigo is completely deſtroyed, and the ſtrength of the oxygenated liquor is aſcertained by its power in diſcharging the colour.

Mr. Roſe has recommended a method which is better adapted for general uſe; which is, "to have ſmall meaſures properly proportioned to each other, and when the liquid is ſtrong, to prevent waſte of the indigo liquor prepared as above, and a tedious repetition of meaſures, let a ſmall meaſure of the liquor to be tried be put into a meaſure containing 24 of the ſame meaſures of water (it then becomes diluted to a twenty-fifth part); to a meaſure of this diluted liquor add as many meaſures of the blue teſt as it will diſcharge, which multiplied by 25, gives its whole ſtrength. It will be proper to have a meaſure of five for the ſake of diſpatch, in adding the blue teſt liquor. It is neceſſary that the experimenter ſhould ſit low enough to view his meaſures horizontally, in order that they may not be overfilled, otherwiſe he may be deceived.

Great care ſhould be taken in the choice of the indigo and the vitriolic acid employed, for unleſs the indigo is of the Guatimala kind, or beſt Eaſt India, and the vitriolic acid highly concentrated and pure, the colour produced will be a greeniſh brown, inſtead of a bright blue.

Mr. Chaptal has employed the oxygenated muriatic acid to the purpoſe of bleaching paper, both by applying it to the rags before worked down, and to the pulp or paſte; he alſo reſtored the white to prints diſcoloured by time, by immerſing them in the oxygenated muriatic acid liquor, or expoſing them to the action of its vapour. And ſeveral patents have been granted in this kingdom for bleaching pulp or paper, amongſt which Meſſrs. Clement and George Taylor, of Maidſtone, in Kent, have obtained one for bleaching the pulp, by incloſing it with a liquor of oxygenated muriate of pot-aſh, in a veſſel reſembling a churn, eight feet diameter at the great end, three feet four inches diameter at the little end, and two feet ten inches in the clear. This veſſel revolves upon an axis at each end, and the pulp, by this motion, and projecting parts within the veſſel, is conſtantly expoſing freſh ſurfaces to the liquor, till the whole pulp is ſufficiently whitened.

Mr. Bigg, of Iping, in Suſſex, has ſince obtained a patent for bleaching paper, and reſtoring to whiteneſs damaged or mildewed paper, by expoſing in cloſe wooden veſſels paper, in quantities of ſix or eight ſheets together, on wooden frames placed at ſmall diſtances from each other, to the action of oxygenated muriatic gas, and after the paper is taken out, preſſed, and dried, previous to its being ſized, wetting it in a ſolution of alum water.

Another method he propoſes, is by wetting and ſoaking the paper in oxygenated muriatic acid liquor, till it is properly bleached; after which it ſhould be well preſſed and dried, and wet out in the alum water, as in the other proceſs.

A patent has likewiſe been granted to Mr. Elias Carpenter, of Bermondſey, London, for a method of bleaching paper in the water leaf or ſheet, and ſizing it without drying; he uſes for this purpoſe a ſtout deal box or caſe, which muſt be carefully cloſed, and capable of confining water or ſteam within this. The paper to be bleached is to be hung on ſtrips of glaſs, about 15 inches long, placed in grooves within the box, about four ſheets on each ſtrip; the paper is taken for this purpoſe when preſſed in the packs in its wet ſtate, and when the box is filled and cloſed, it is expoſed to the action of oxygenated muriatic gas for eight or ten hours, and when ſufficiently bleached, ſized with a preparation made from one hundred weight of pieces of ſkins boiled in water and ſtrained, then fourteen pounds of alum, ſeven pounds of white vitriol, and one pound of gum arabic added; theſe ingredients will make ſize enough for about 50 reams of foolſcap paper; the paper when ſized and preſſed, is finiſhed in the uſual way. To prevent the noxious qualities of the gas to the workmen, he directs a ſolution of pot-aſh in water to be placed at the bottom of the bleaching box, to abſorb the elaſtic vapours which would otherwiſe affect them on opening the box.

Mr. Tennant of Glaſgow, ſubſequent to the patent granted him for his bleaching liquid, has obtained a patent for preparing the oxygenated muriate of lime in a dry form, by which means bleachers may be cheaply and conveniently ſupplied with it by him, and ſave much of the trouble, expence, and hazard which attend the preparation of the former bleaching liquor.

To bleach ſilk from its natural gummy ſtate, whether in ſkain or manufactured, it ſhould be put into a thin linen bag, and thrown into a veſſel of boiling water in which good white ſoap has been diſſolved; the ſilk ſhould boil two or three hours in this liquor, and the bag of ſilk frequently preſſed with a ſtick, and turned, ſo that the gummy matter may ſeparate from it, and riſe to the ſurface of the liquor, from whence it ſhould be ſkimmed off, and thrown away; the bag ſhould then be taken out, and if it contains ſilk goods, they ſhould be well waſhed in clean cold water, to prepare them for printing or dyeing; but if the bag contains ſilk in the ſkain, after it has been well waſhed in clean water, beaten, and ſlightly wrung, it may be put the ſecond time into the copper veſſel, filled with cold water mixed with ſoap, and a little indigo blue, if you wiſh it tinged a little of the blueiſh hue.

The ſilk, when taken out of the ſecond water, ſhould be wrung hard with a wooden peg, to preſs out all the liquor; then ſhaked, to ſeparate the threads; then ſuſpended on poles, in a cloſe room or ſtove where ſulphur is burnt, which improves the whiteneſs of the ſilk.

Woollen cloths or ſtuffs may be bleached and made white by ſoap and water; by the vapour of ſulphur; or by chalk, indigo, and ſulphuric vapour. In the firſt caſe, after the ſtuffs have been cleaned at the fulling mill, they are again worked in warmiſh ſoap and water, to render them whiter, and afterwards waſhed in clear water and dried; in this ſtate they are fit for dyeing any light colours.

To deſtroy or remove the reddiſh hue ariſing from boiling printed cottons in madder decoctions, which prevents the

printed colours appearing to advantage, the goods are usually boiled for some time in bran and water, and then exposed to the air, by laying them on the grass, and throwing upon them clear water from time to time. Mr. Grimshaw, in the year 1796, obtained a patent for clearing printed goods coming from the madder copper, by using the grains after brewing malt liquors, instead of bran; the plan he recommends is, that the grains should be previously sour, and that three or four bushels thereof, more or less, according to the colour of the cloth, should be put into a copper of hot water, containing 200 gallons or upwards, and four or five pieces of the printed cotton goods then immersed therein, and worked over a winch backwards and forwards, for ten or fifteen minutes; the pieces are then taken out of the copper, and well washed in clear water, and laid straight upon the ground for two or three days, till the parts which should be white become clear. The same liquor, with the addition of a few grains, will serve to clear other printed goods, till the whole number wanted to be cleared have been completed; a sufficient quantity of clear water being added to replenish what has been absorbed by the goods, or evaporated in boiling. After either of the operations above-mentioned, the immersion of the printed goods in dilute oxygenated acid, will answer the purpose of the exposure to the air.

Bleaching *of Books, Prints*, and *Paper*. See Books, &c. and Bleaching; *supra*.

Bleaching *of Hair*. See Hair.

Bleaching *of Wax*. See Wax.

BLEAK, in *Ichthyology*, the English name of Cyprinus Alburnus, a species distinguished from the other fishes of its genus by having twenty rays in the anal fin.

The bleak is a very abundant fish in many of the English rivers, and in those of the northern countries of Europe in general. The flesh is in some esteem; but it is chiefly taken for the sake of the beautiful silvery scales, which artists make use of in the manufactory of artificial pearl. The credit of this invention is claimed by the French; and it is said that they have arrived at such a degree of perfection in this art, that, independent of the plain silvery hue of the beads in common, they can vary the colour to blue, green, or any other vivid tint they may desire. The process is very short; the scales are scraped off, washed, and then reduced to a fine powder; this is diluted with water, and introduced into a thin bubble of glass, where it forms an internal coating; the cavity is then filled with wax, through which a hole is bored, and the bead is finished.

Gmelin speaks of this species being from four to ten inches in length; but these do not commonly exceed six inches. This fish is infested in the summer-time with a creature of the vermes tribe, that lives in the intestines, and which oftentimes increases to such a vast size as to occasion the death of the bleak. Fishes so infested rise to the surface of the water, where they leap and tumble about in the greatest agonies, and in that state are well known to the fishermen by the name of mad bleaks. The white bait taken in the Thames at Blackwall and Greenwich, in the month of July, is believed to be the fry of this species. Vide Donov. Brit. Fishes, pl. 18.

BLEB, a small blister, or bubble.

Naturalists have observed small purple blebs on all the plants of the *hypericum* kind. Phil. Transf. N° 224. Thick pieces of glass, fit for large optic glasses, are rarely to be had without blebs. Ibid. N° 4.

BLECHINGLEY, or Bletchingley, in *Geography*, an ancient but small borough town of Surrey, in England; has had the privilege of returning members to parliament from time immemorial. The right of voting is vested in burgage tenure; and the lord of the manor's bailiff was the returning officer till 1723, when, by a resolution of the house of commons, he was deprived of that office; and the borough has now the singularity of sending two members to parliament, without a mayor, constable, or any other legal returning officer. Sir Robert Clayton is the proprietor of the borough, and has consequently the power of appointing the representatives. The town occupies the summit and side of a hill, and commands some fine and extensive prospects into Kent, Hampshire, &c. Here was formerly a castle, which is nearly obliterated, and its scite is overgrown with coppice wood. An alms-house and free school are the only charitable foundations of this place. The church is large and handsome; but its spire was destroyed by lightning in 1606, at which time the bells were melted by the electric fire. Fuller's earth and a species of iron-stone are obtained in the vicinity of this town. Blechingley is 21 miles south from London. The town and suburbs within the parish, contain 186 houses, and 1344 inhabitants.

BLECHNUM, in *Botany*. Lin. gen. n. 1175. Reich. 1292. Schreb. 1627. Class *Cryptogamia Filices*, or ferns. Gen. Char. Fructifications disposed in two lines, approaching to the rib of the frond, and parallel.

Species, 1. B. *occidentale*, South American B. "Fronds pinnate; pinnas lanceolate, opposite, emarginate at the base." This species rises by a simple undivided stalk to the height of 13 or 18 inches; leaves long and narrow; many pinnas, with two small auricles at the base. A native of the West India islands, and the continent of South America. Introduced here about 1777. 2. B. *orientale*, Chinese B. "Fronds pinnate; pinnas linear, alternate." Frond three feet long; stipe covered at the base before, with large grey bristles; the anterior side scored with three longitudinal grooves; leaflets linear-lanceolate, sessile, smooth, entire, streaked at an acute angle, the length of the finger. Found in China by Osbeck, and also in the Society isles. 3. B. *australe*, Cape B. "Fronds pinnate; pinnas subsessile, cordate-lanceolate, quite entire, the lowest opposite." Stipes a foot long, green; fronds entire, about the edge rugged; the barren ones with broader pinnas, truncate at the base; the fertile, with lanceolate pinnas, heart-shaped at the base; having two lines of fructification, longitudinal, and distant both from the edge and rib. A native of the cape of Good Hope. Introduced here, in 1774, by Mr. F. Masson. 4. B. *virginicum*, Virginian B. "Fronds pinnate; pinnas multifid." Having the stature of polypodium filix mas or male fern; frond smooth; pinnas lanceolate, sessile, semipinnatifid, acute; divisions obtuse, quite entire. A native of Virginia and Carolina. Cultivated, in 1774, by Dr. John Fothergill. 5. B. *japonicum*, Japonese B. "Frond bipinnatifid; pinnules ovate, obtuse, serrated." Stipe convex at the back and smooth, before flat and streaked; the whole smooth, flexuose, equal; pinnas oblong, acute, pinnatifid; the lower subpetioled, the upper sessile; differing from the *orientale* in having an erect frond and blunt pinnules. A native of Japan. 6. B. *radicans*, rooted-leaved B. "Fronds bipinnate; pinnas lanceolate, crenulated; the lines of fructification interrupted." Frond rooting; pinnas sessile, slightly concurrent at the base, serrate with a very fine callus, acuminate, more veined beneath; the line of fructification is next the nerve, but interrupted as it were by long points. A native of Virginia and Madeira, where it was observed by Kœnig. Introduced, in 1779, by Mr. F. Masson.

Propagation and Culture. The fourth species alone will abide the open air in England; the first must be kept in the bark stove; the rest require only the protection of the dry stove, or conservatory; they are increased by parting the roots. Martyn.

BLEDSOE Lick, in *Geography*, lies in the ſtate of Tenneſſee, in America, 32 miles from Big Salt Lick garriſon, and 36 from Naſhville.

BLEEDA, or Blida, in *Geography*, a town of Africa, in the kingdom of Algiers, and province of Titeri, is ſituate in the interior of the country, over-againſt the mouth of the Ma-Saffran, at five leagues diſtance, under the ſhade of a ridge of mountains, forming a part of mount Atlas. It is about a mile in circuit, encompaſſed by a wall chiefly of mud perforated by hornets, and tolerably populous, but without much trade; ſome of the houſes are flat-roofed, and others tiled; it is well-watered, as a branch of an adjacent rivulet may be conducted through every houſe and garden, and it is ſurrounded by very fruitful gardens and plantations. As Bleeda and Medea (ſee Medea) lie nearly in the ſame meridian, and are ſituated at a proper diſtance from the Hamam Mereega, the Aquæ Calidæ Colonia of the ancients, and as their modern and ancient names reſemble one another, Dr. Shaw ſuppoſes that we may take one for the Blida Colonia, and the other for the Lamida of Ptolemy. That part of mount Atlas which lies between theſe towns, and reaches as far as mount Jurjura, is inhabited by numerous clans of Kabyles; few of which, from their rugged ſituation, have been made tributary to the Algerines. The Beni Sala and Haleel overlook Bleeda, and the rich plains of Mettijah; whilſt the Beni Selim and Haleeſa ſometimes deſcend into the paſture ground, near the banks of the Biſhbeth, or river of fennel, of which a great quantity grows on its banks. Shaw's Travels, p. 36.

BLEEDING, or Blood-letting, in *Medicine*, a ſpecies of evacuation frequently reſorted to, as a principal remedy in inflammatory affections, ſuch as pleuriſy, peripneumony, phrenitis, quinſey, enteritis, acute rheumatiſm, &c.; and in diſorders accompanied with plethora, ſuch as mania, apoplexy, &c. See theſe diſeaſes ſeparately. In all theſe caſes, the earlier this remedy is employed the better, and eſpecially in thoſe inflammatory diſorders, ſuch as phrenitis and peripneumony, where, from the great vaſcularity of the part, the progreſs of the inflammatory action is extremely rapid, and the injury done to organs ſo eſſential to life, often becomes irreparable.

Nor is the *timing* of this remedy the only circumſtance that requires attention. Other circumſtances of equal moment are to be attended to; viz. *the quantity of evacuation, and the judiciouſneſs with which it is effected.* The quantity muſt be regulated by the degree and ſeat of inflammatory action, and the age and conſtitution of the patient. The appearances of the blood, when drawn (ſee Blood), are commonly regarded as a good criterion for regulating the repetition of the lancet, and the quantity to be taken away each time; but the ſtate of the pulſe affords a much better guide; and venaſection will often be found neceſſary in caſes where the buffy coat or fizy appearance of the blood is not preſent in any conſiderable degree.

The impreſſion produced upon the ſyſtem is very different, according as the blood is drawn from a large or a ſmall orifice; i. e. according as it is evacuated ſuddenly or ſlowly. The former method is to be practiſed in all violent inflammations of parts eſſential to life; ſuch as the brain, the lungs, the ſtomach, &c; for thus the increaſed action of the vaſcular ſyſtem is ſubdued almoſt on the onſet; a momentary deliquium is induced (a ſtate the oppoſite to that in which the morbid condition conſiſted) from which the moſt beneficial conſequences reſult.

Provided equal quantities of blood be drawn in equal times, it matters not whether it be taken from the *right* or the *left* arm; in other words, ſuppoſing, in the caſe of pleuriſy, the ſeat of the pain and inflammation to be in the *right* ſide, thoſe ſymptoms will be as ſpeedily removed by taking away in the whole thirty ounces of blood at three different times from the left arm, as they would be, if the ſame quantity were taken away from the *right* arm, in the ſame number of times, and from orifices equally large; becauſe in both caſes there is the ſame quantity abſtracted from the whole maſs of blood, and conſequently from the quantity circulating through the lungs, and their inveſting membranes; whence the *general* and *local* effects in both caſes are ultimately the ſame. Hence the futility of the doctrine of *Revulſion*, about which ſuch warm diſputes were at one time carried on.

Hitherto we have merely hinted at the *general effects* produced upon the ſyſtem by blood-letting. It will now be expected that we ſhould ſpecify what they are. The firſt and moſt obvious effect is upon the heart and arteries. The blood is to them a ſtimulus; conſequently, by withdrawing a quantity of that fluid from them, we withdraw a proportionate quantity of ſtimulus, and bring down their action ſo much nearer to their natural ſtandard. The abſorbents participate in this change; whence a leſs impeded exhalation takes place. At the ſame time a diminution of the animal heat ſucceeds. But the cerebral ſyſtem and the vaſcular ſyſtem are ſo intimately connected, that the one cannot be materially affected without producing a correſponding effect upon the other. This is proved by the deliquium and convulſions which ſucceed to ſudden and profuſe hæmorrhages. Thus it appears that the beneficial effects of blood-letting, in the diſorders to which it is applicable, are not owing merely to the abſtraction of a quantity of the circulating maſs, and conſequent abatement of activity in the ſanguiferous veſſels; but alſo to the abſtraction of a quantity of the ſuperfluous *Animal Heat*, and to the impreſſions at the ſame time made upon the lymphatic veſſels, and finally upon the ſyſtem of brain and nerves.

From this view of a remedy ſo powerful and ſo extenſive in its operation, it is eaſy to perceive what miſchievous and even dangerous conſequences muſt reſult from its abuſe. Being the moſt ſpeedily debilitating of all remedies, it is obvious that what is termed *general bleeding* ought never to be reſorted to, but in caſes where the pulſe denotes an increaſed degree of ſtrength, as well as exceſſive activity. It has been from attending merely to its increaſed activity, and the accompanying accumulation of heat, without a due eſtimation of the ſtrength of the pulſe in fevers and other diſorders ſuppoſed to be inflammatory, that ſo much abuſe has been committed in the employment of the lancet. See Fever; under which article, the propriety and impropriety of blood-letting will be fully conſidered, with remarks on the practice of Fernelius, Botallus, Sydenham, Pringle, and other celebrated phyſicians, who puſhed this remedy to an extravagant length.

Although *general* bleeding be only admiſſible under the conditions above mentioned, yet *topical* bleeding may be ſometimes employed with good effect in caſes of partial inflammation, exiſting in ſtates of the body where vigour in the ſyſtem at large is wanting; eſpecially when the veſſels belonging to ſome organ eſſential to life, are obſtructed, overloaded, or inflamed.

Bleeding was formerly employed for the purpoſe of *preventing* plethoric and inflammatory conditions of the body. Hence many of the old writers recommend it to perſons in health, both in ſpring and autumn, to pregnant women, &c.; but this practice is very properly diſcontinued, and other modes of counteracting a tendency to over-repletion are adopted in its place; ſuch as a vegetable diet, regular exerciſe, occaſional purging, and the like.

Bleeding,

Bleeding, or Blood-letting, in *Surgery*, is the artificial extraction of blood from an Artery or Vein, for medicinal purposes. The operation of cutting an artery is named Arteriotomy; that of opening a vein is called Venesection, or Phlebotomy.

The instrument used in this country for bleeding the human subject, is denominated a Lancet; though a *phleme*, or *fleam*, was formerly employed, and is still very commonly used by farriers in England, and even by the best surgeons in Germany, &c. See the *Plate* of *Surgical Instruments*. The lancet, on these occasions, is used single; but where the intention is to puncture numerous small blood vessels at the same instant, rather than any one considerable vein or branch of an artery, surgeons have recourse to an instrument containing many lancets, which is known by the name of Scarificator.

Leeches are often applied to a part of the body requiring the local evacuation of blood; and in this case, as well as in scarifying, the operation is termed *local* bleeding, in contradistinction to *general* blood-letting by the lancet.

Some nations, especially those which have scarcely emerged from a state of barbarism, are accustomed to draw blood by making one or more incisions or punctures at random, with a knife, a stone, a tooth, or a needle. See Acupuncture, Phlebotomy, Arteriotomy, Leeches, and Cupping.

The art of bleeding may be traced back to the remotest antiquity, and seems to have been common among the Egyptians, Assyrians, Scythians, &c. at a time when anatomy had never been cultivated. The Greeks boast that Podalirius, the son of Esculapius, was the first who practised bleeding, soon after the siege of Troy; but the fact itself is related by only one author (Steph. Byzan. in voce *Syrna*), who lived too long afterwards to be credited implicitly. It is therefore much more likely, that bleeding had been performed previously to the time alluded to. Pliny, indeed, supposes that physicians first learnt this operation from having observed the hippopotamus draw blood by pushing sharp reeds into its body (Hist. Nat. lib. viii. cap. 26.); but this is a very improbable thing, as there is very little analogy between the artificial opening of a vein with a lancet, and the random wounding of an animal by friction against a broken reed.

We shall, however, not enlarge on the history of this practice, but proceed to describe the common modes of opening a *vein* in several parts of the body, after which we shall treat of Arteriotomy.

When we resolve to perform venesection, we must, besides the instruments required for that operation, have in readiness one or two well-rolled blood-letting bandages, or tapes, from four to eight feet in length, and of two fingers breadth, with pins, or else needles and thread. Those bandages are, by foreigners, reckoned the best, which have narrow straps at their ends.

In general, venesection is practised at the bend of the elbow, or upon the foot. When the patient is to be bled at the arm, we place him, with his face towards the light, upon a chair of a moderate height; draw his shirt as high as is necessary above the elbow; let him extend his arm to a certain degree, but not too much; after which, the surgeon, in order that the veins may become turgid by checking the circulation, applies a bandage (which is often made of fine red cloth), of the breadth of three or four fingers, twice round the arm above the elbow, with the ends of which, after having previously drawn them moderately tight, he ties a bow with a single knot, at the posterior part of the arm. Whether this bandage has been properly applied, we know by the circumstance, that the veins become elevated and tumid, whilst the pulsation of the artery at the wrist is distinctly perceptible.

We then choose a vein in the bend of the elbow, which must be done with caution. The upper is the cephalic vein, and this a beginner ought, if possible, always to choose, as little or no danger is to be apprehended from opening it; but it is very seldom to be seen or felt, and commonly is too small. The median vein is most easily seen and felt; but generally the tendon of the biceps muscle is situated under or at the side of it, which we must take great care not to puncture. The inner vein of the arm, or the basilic (which in the right arm is by some termed the hepatic vein, and in the left the splenic), is indeed commonly very easy to be seen, and still more easy to be felt; sometimes, however, it is also very small, or lies so close upon the artery as to render it hazardous to open it.

Some recommend blood-letting upon the back of the hand, although this is an inconvenient place, and, in certain cases, not very safe for the operation. But if it is to be performed, we tie the red bandage two fingers breadth above the wrist, round the fore-arm; and, in order to raise the vein, let the patient then hold his hand in warm water. The most common vein upon the hand is the cephalic of the thumb, which lies between the bones of the carpus; with which the thumb and the fore-finger are joined. But the vena salvatella of the middle finger, which lies between the two metacarpal bones with which the middle and the ring fingers are joined, is at present but very rarely opened, and only when no other is to be seen; especially as it does not discharge much blood, is difficult to be tied, and, if cut quite through, forms a thrombus.

In bleeding these veins, the patient must be placed in a somewhat oblique position against the light; so that when the hand is half closed, and laid upon the edge of the vessel, the fingers are directed towards the light, in order that the instrument may throw no shade upon the place of the vein where we intend to open it.

Bleeding at the foot is generally performed upon the vena saphæna, which lies upon the first metatarsal bone, connected with the great toe, running along it and the tarsus, over the inner ankle. Where it lies close upon the ankle, it is inconvenient to open, and we must be very careful lest we cut through it and injure the periosteum, or even thrust the fleam or lancet into the bone itself. If possible, it will be better to open it one, two, or three fingers' breadths farther from the ankle towards the great toe. We may also open a branch far forwards, almost close upon the great toe; and here we are required often to open it with pregnant women who have swelled legs.

The other pretty safe vein upon the foot is the cephalica pedis, that lies between the two tendons which extend the great and the second toes; only we must be cautious not to injure the tendon lying beside it. The other veins situated upon the back of the foot should never be opened, but in cases of extreme necessity; for the operation is attended with danger, on account of the contiguous tendons; besides, they do not discharge a sufficient quantity of blood, and they almost always form a thrombus, which a beginner should be careful to avoid.

When we bleed at the foot, the patient should first place the limb in a pail of warm water, in order that the vessels may be seen and felt; and it is also necessary with small veins to apply the red bandage, which, however, in order that the purpose of checking the flow of the blood may be attained, and no inconvenience occasioned, must be applied in the middle of the calf, especially with lean persons, in

the ſame manner as on the arm; but the bow and its knot muſt not lie upon the tibia.

On the arm, therefore, we chooſe either the cephalic or the median vein, and, if the tendon lying below it ſhould occaſion heſitation, the baſilic, eſpecially if this lies more convenient and ſuperficial. When the ſurgeon, then, has brought his eye to the proper diſtance from the vein, he wets the point of his middle finger, preſſes gently with this finger upon the vein at the places where he thinks he can beſt open it, and accurately marks the place with which he was ſatisfied in trying by the feel; after which he ſuffers the arm to fall down again into the patient's lap. In the ſame manner he chooſes a vein upon the hand.

For blood-letting at the right foot, the patient is placed upon a chair of a moderate height, in the moſt enlightened part of the room, with his face directed towards the window, and his feet immerſed in a veſſel filled with warm water, ſo that the water covers all the veins of the whole foot. When therefore the foot is warm, and the veins ſufficiently tumid, the ſurgeon lays hold of the foot with his left hand, and places it with the middle of the ſole upon the edge of the veſſel which is the moſt remote from the body, in ſuch a manner, however, that the foot is not extended, but forms a right angle with the leg. With the middle finger of the right hand he examines thoſe veins which lie the moſt elevated, and makes, according to the rules before laid down, a ſcientific ſelection; but he muſt always firſt direct his attention to the vena ſaphæna.

The moſt convenient attitude for the ſurgeon is when he kneels down with one knee; as in this poſition the eye is near to the vein, the poſition is firm, and can be better ſupported for the requiſite length of time. If any other vein beſides the ſaphæna be choſen, the patient is directed to move his toes, whilſt we are examining the vein, in order that we may feel how near a tendon may be ſituated below it; and here the caution ſhould be obſerved, not to make all the fingers wet, for the warm water diminiſhes the ſenſe of touch, and conſequently renders it indiſtinct. We therefore uſe at firſt only one hand, becauſe, in caſe of a failure, or from ſome other cauſe, we may be under the neceſſity of taking alſo the other foot.

The vein may be opened either longitudinally, that is to ſay, in the direction of its courſe, or we open it rather obliquely or tranſverſely. The firſt is the ſafeſt, eaſieſt, and moſt convenient method; but it is admiſſible only with large veins, and when we foreſee that during the operation they will not ſlip or twiſt, as it were, out of the way of the inſtrument. Commonly the veins are opened ſomewhat obliquely, and in this manner we may generally open the veins on the arm, and in moſt caſes upon the foot. But when the veins are too ſmall, there is reaſon to apprehend that we may not hit them, or that they will not diſcharge a ſufficient quantity of blood; and when their ſituation requires it, as is the caſe with the cephalic of the foot (where it lies over the tendon that elevates the great toe), the orifice muſt be made quite tranſverſely.

When therefore we have properly examined the vein with the moiſt finger, we hold the phleme in readineſs (if we uſe this inſtrument); that is to ſay, we draw up the ſpring, take it in the right hand, ſo that the thumb lies upon the ſlider, the fore-finger upon the bridge, and the middle finger upon the preſſer, exactly over its ſpring, and the ring finger upon the round part of the bottom plate. With the fore-finger and thumb of the left hand, which are moiſtened with a little ſaliva, we move the iron as high up in the groove as we think it neceſſary to make the orifice deep; and place the box (after having again elevated the arm, or taken the foot or hand out of the water, and ſupported them, in the manner above deſcribed, upon the margin of the veſſel) in ſuch a manner upon the ſkin, that the iron has exactly the proper direction toward the place where the orifice is to be made, and then, by a gentle preſſure with the middle finger, let the ſpring fly looſe.

If a perſon ſhould be ſo fat as to render bleeding impracticable, and with ſuch it is at leaſt very difficult to do it on the foot, we may in ſome meaſure attain our purpoſe, if we direct the patient, as he gets out of bed, to hold his foot or hand in warm water; after which the veins will generally become ſufficiently perceptible to the eye or touch of an experienced ſurgeon.

But though the phleme is uſed for blood-letting, eſpecially in Germany, it is however an univerſally acknowledged truth, that the *lancet* is the ſafeſt and beſt inſtrument for the purpoſe. We run leſs hazard with it of doing damage, and the ſurgeon is always able, according as the circumſtances require, to make the orifice either ſmall or large. When therefore we let blood with the lancet, we place it ſo that the handle forms a ſomewhat acute angle with the blade. The ſurgeon next lays hold of the limb upon which he is to perform the operation, ſuppoſe the right arm, with his left hand; and at the ſame time preſſes with the left thumb upon the vein, about two fingers' breadth below the place which is choſen for the orifice: he then takes the lancet between the thumb and fore-finger of the right hand, ſo that ſomething more of the blade is uncovered than he thinks neceſſary to introduce. At the ſame time he lets his hand reſt upon the middle, ring, and little finger, which muſt be placed as conveniently as poſſible below the vein that is to be opened. He then puſhes the point of his lancet carefully through the ſkin and integuments into the vein, and carries the inſtrument in an oblique direction a little forwards, till the orifice is ſufficiently large. But, during the introduction of the lancet, the operator muſt hold the point as ſteady and even as poſſible, in order that it may not penetrate into the ſubjacent parts. Should he, however, not be able to depend ſufficiently upon the ſteadineſs of his hand, he will do well to leave no more of the point of the lancet uncovered than is to penetrate into the vein. The Surgeon having withdrawn his right hand, at the ſame time removes the thumb of his left hand from the vein, in order that the blood may flow out freely.

If the blood will not flow properly, notwithſtanding the vein has been properly hit, either the orifice is too ſmall, or fat perhaps gets into the orifice of the integuments and ſtops it. The fat is to be preſſed back, by ſtroking with a wet and warm ſponge, or by means of an inſtrument. The impediment, indeed, may lie in the motion of the part; when, for example, the arm is bent obliquely, or the foot is placed in the water, the orifice of the vein may eaſily be diſplaced, and ſome of it be cloſed by the ſound part of the ſkin. But, finally, the circumſtance may alſo be occaſioned by the viſcid conſiſtence of the blood. To this latter cauſe it is often to be attributed, after the firſt few minutes; on which account it will be proper to wipe the arm, over the orifice of the vein, with a ſponge filled with warm water, and let the hand reſt in a ſomewhat higher ſituation than the orifice, upon a ſtick, which the patient may alſo turn round, or preſs firmly with his fingers.

When a ſufficient quantity of blood has flowed from the vein (for example, in the arm), and we are to tie it up, we take the ſponge, moiſtened with warm water, in the right hand, the bandage in the left, and the linen compreſs between the thumb and middle finger of the ſame hand; we hold againſt the vein with the ſponge, and with the left hand remove

emove the red bandage and hang it over the chair, or the ſhoulder of the patient. The aſſiſtant takes away the veſſel into which the blood has been received, and the operator now with a moderate preſſure draws the ſponge from the vein towards the hand in a right line with the orifice that has been made; and it will be proper, whilſt he brings the lips of the wound together with the thumb of his left hand from the ſide, to repeat the wiping with the ſponge once more, in order completely to remove the blood that may have been left in the orifice.

When the ſurgeon now ſees the vein well cloſed, he lays upon it the compreſs, with the fingers of his right hand, whilſt he draws it towards the thumb of the left hand upon the ſkin; and when the middle of it is upon the orifice, he preſſes it down with the fore and middle fingers of the right hand, and immediately changes theſe for the thumb of the left hand. With the right hand he waſhes the blood from the limb, by means of the ſponge; after which, he lays the ſponge aſide. He then takes the bandage out of his left hand, lays hold of it with the fore and middle fingers of the right hand at the inner part of its head, and the thumb upon the outer, and places it upon the compreſs in ſuch a manner that the fingers of the left hand make way for it, whilſt the two fingers of the right hand continue the preſſure in their place. But, immediately after, theſe are again changed for the left, fore, and middle fingers, which now preſs at the ſame time upon the one turn of the bandage and the compreſs. The right hand carries the bandage croſs-ways round the arm, whilſt the fore fingers of the two hands always alternate, till the laſt, when both ends of the bandage are either ſewed, tied, or pinned together.

Notwithſtanding we have given theſe very preciſe directions, a young ſurgeon will learn better by ſeeing the operation performed by a ſkilful hand, than by any verbal inſtructions.

Tying the vein upon the thumb is performed in the following manner:—Preſſing with the compreſs, which here muſt be pretty narrow and thick, is like that performed on other veins; and therefore, whilſt we hold it faſt upon the wound of the vein with the two fore fingers of the left hand, we let the bandage, (which is rolled upon one head, an inch in breadth, four feet in length from the end to the place where it touches the compreſs), hang about half a foot down over the back of the hand, obliquely from the wriſt outwards; carry the head of the bandage, after preſſing it over the compreſs with two fingers of the left hand, through between the thumb and the fore-finger, over the palm of the hand; and, proceeding over the back of the hand, cover the end of the bandage; then go round the wriſt, again over the back of the hand, under the thumb, and now round the ball of the thumb; again over the turn that has juſt been made acroſs the back of the hand; and after having once more carried it half round the wriſt, pin both ends together on the back of the hand. We may alſo apply this bandage with varied turns. In a ſimilar manner, with turns round the little finger, and circular turns round the wriſt, the bandage is applied, when the vena ſalvatella is opened.

With the veins of the foot, the common bandaging is made by the Stapes, which, however, ſometimes requires a peculiar method, that every one will eaſily be able to adapt according to circumſtances. The bandage may be applied ſomewhat tighter than upon the arm: however, on account of the injurious conſequences, which may even be attended with danger, the bandage muſt not be drawn too tight; but it will be better ſome hours after to examine it again, and if neceſſary, draw it ſomewhat tighter. Upon the whole, it is to be recommended, if poſſible, in all blood-letting operations, eſpecially in arteriotomy, that the ſurgeon ſhould ſee the patient again ſome hours after; as he may obviate ſeveral ſmall inconveniences, which afterwards frequently occaſion unpleaſant complaints.

Veneſection is more rarely performed upon the frontal vein, the veins under the tongue, and upon the neck. For the frontal vein, when it requires to be opened, we apply a bandage, or a garter or cloth, round the neck, lay the middle of the bandage upon the back of the neck, carry both extremities over the throat, and round again to the back of the neck, where an aſſiſtant takes one end in each hand. This the patient may alſo perform himſelf; only then the middle of the bandage muſt be applied to the throat, the two ends carried round the neck till they meet at the throat again; there the patient holds them with both his hands, and according to circumſtances, draws the bandage tighter, or relaxes it, ſo as ſtill to retain ſufficient ſpace for reſpiration. A ſtill more convenient mode of diſtending the veins of the neck, &c. is to paſs the bandage over the ſides of the neck, and under the oppoſite arm-pits, ſo as not to preſs upon the trachea, which may impede reſpiration; then hold the ſwelled vein down with the thumb or finger of your left hand, a little below the part allotted for the operation. The inciſion is to be made, when the vein is ſufficiently tumid, with a lancet.

In order that the blood may not run down upon the face, we preſs a card bent crooked under the orifice upon the ſkin, and thereby conduct the blood into a veſſel. After a ſufficient quantity of blood has been diſcharged, we remove the bandage from the neck, when the bleeding generally ceaſes immediately, and the orifice is ſecured with ſticking plaiſter, or, if it ſhould be neceſſary, with a compreſs and Discrimen bandage.

When we have to open a ſublingual vein, we muſt promote the efflux of the blood, as in bleeding at the forehead by the application of a cloth under the arms and acroſs the ſides of the neck. The orifice is made with the lancet, and the inciſion is continued till it ſeems large enough. In order more conveniently to get at it, we hold back the tongue with a wooden fork, or ſpatula. We may draw a ſilk thread through the wound, in order to clear it from the blood which here eaſily coagulates, and at the ſame time to prevent the lips of the wound from adhering together, and conſequently to obviate whatever might impede the flow of the blood. When its flow muſt be ſtopped, we take off the bandage, and let the patient hold ſome ſpirit of wine, or common brandy, in his mouth. If the blood flows more copiouſly, we may diſpenſe with the thread, and immediately remove the bandage from the neck; alſo, when it is to be ſtopped, apply a little alum or agaric to the wound, and preſs it down for a time; or apply Lampe's compreſſory, deſcribed in I. Val. Heinr. Koehler Anleitung zum Verbande, &c. Leipzig, 1796, 8vo. *Tab.* VI. *fig.* 5.

To bleed at the external jugular vein, the bandage is likewiſe applied round the neck; againſt the clavicle, and upon the vein that is to be opened, a thick compreſs is placed, and the bandage drawn ſomewhat together. The thumb is placed upon the compreſs which lies upon the vein and the fore-finger over it, in order to ſecure it and to ſtretch the ſkin; we then take a pretty large lancet, and with it open the vein in the ordinary manner; only with this difference, that we muſt introduce it deeper, and make the external orifice larger. To catch the blood, we make uſe of a card, as in bleeding at the forehead. When a ſufficient quantity of blood has been drawn, we remove the bandage; after which, the lips of the wound generally cloſe ſponta-

neously. But should a bandage be necessary, we may secure a compress upon it by means of two circular turns round the neck. As this bandage, on account of the pressure upon the trachea and vessels, &c. of the neck, is always very troublesome; and also the pressure, as it never must be strong, is frequently insufficient; we may most conveniently use the instrument invented by Mr. Chabert for compressing the veins of the neck. In want of it, we must let an assistant close the orifice by pressure with his finger, till the danger of hæmorrhage is over.

Some moisten the compresses with brandy, vinegar, &c. and thereby, on account of the irritation, occasion some inconvenience at the orifice of the vein, in which sometimes inflammation, and even a suppuration, is excited. It is better to apply the compress dry, or to stick upon it a piece of gold-beater's skin, whereby the lips of the wound, if they have been well brought together, are retained in that state, so that the bursting open of the vein is more effectually prevented.

Easy and insignificant as some young surgeons think the operation of phlebotomy, it nevertheless often requires the greatest accuracy, and is on that account one of the most delicate operations. To a true surgeon, therefore, it is always of importance, and the more so as his honour and reputation are endangered by committing an error in it. Frequently the faults which the patient commits during and after the operation, such as incautious motion of the limb whilst the operation is performing, violent exertion of it, drawing on boots, &c. after blood-letting at the feet, are ascribed to the negligence or ignorance of the surgeon. Inasmuch also as no operation occurs so frequently as this, and as it so very often endangers the life of a man, or at least an error committed may give rise to such danger; the surgeon must well consider the symptoms which occur in it, and may superinduce more important consequences dangerous to health, in order that he may timely obviate or remove them.

Sometimes there arises, as the most common bad consequence of blood-letting, an inflammation of the external integuments, and of the subjacent cellular substance. Sometimes it is chronic, but little painful, suppurates slowly, and produces a circumscribed abscess. Sometimes it is more diffused, and has the appearance of an erysipelatous inflammation: sometimes it is violent and acute, and resembles a phlegmon. This generally occurs when the instrument is a bad one, and rather tears than cuts; when the patient is of a very irritable habit, and much disposed to inflammation: when the requisite precautions for healing the wound by the first intention are neglected, and the arm is suffered to be moved: when the wound is externally rubbed, pressed, &c. The nature of this inflammation cannot be mistaken, and it must be treated like a common wound.

It may sometimes happen, that when the wound of the vein does not soon close, an inflammation of the vein takes place, which however varies with respect to its violence, its extension, and progress. In a milder degree, this inflammation is followed merely by a slight swelling of the vein, and an adhesion of its sides. A violent inflammation induces suppuration. The common method of treatment is the antiphlogistic. As the internal membrane of the veins is continued to the heart, and as inflammations in such membranes spread easily and rapidly, where they are not prevented by an adhesion of the sides of the vein, it is in most cases advisable to produce such an adhesion by the application of external pressure at some distance above the orifice. If, as may very easily happen, such an inflamed vein should pass into suppuration, it would (if known) then be necessary to cut open the vein, in order to prevent the pus from mixing with the circulating fluids.

When a vein has been cut entirely through, the pain is not greater than common, nor does the patient experience any inconvenience whilst the blood is flowing; but a greater or less quantity of it descends under the vein into the adipose membrane, remains there inclosed, and during the first twenty-four hours occasions a tension. The external orifice of the skin may be displaced from the orifice of the vein, likewise, when the orifice of the integuments is smaller than that of the vein; when the patient moves the arm too much, in consequence of which some blood is indeed discharged from the wound, but more penetrates between the vein and the skin into the cellular texture; and when the operation has been absurdly performed where two veins anastomose; from all these causes an effusion of blood may take place, in consequence of which the part acquires a bluish black colour, and sometimes an ecchymoma, sometimes a sugillation, and at other times a thrombus is produced. Although the appearance frequently seems to indicate greater danger than really exists, the speedy application of remedies is nevertheless necessary.

In the first case, cataplasms, with warm vinegar, wine, and other spirituous or discutient remedies, are serviceable. When such extravasated blood is not again taken up, or when the vessels are inadequate to its re-absorption, on account of its great quantity, an abscess is generally formed, which must be treated according to the rules of art, and the spirituous remedies laid aside. See Abscess. In the sugillation, we must endeavour to remove the obstacles that may impede the circulation of the blood: these are either external ones, such as a too tight bandage, by loosening which the complaint is removed; or they are internal ones, and occasioned by a contraction of the vessels. In a recent sugillation, we may combine the resolvent means above-mentioned with mild astringents; and when the stagnating blood has been again dissolved and removed, we at last apply cold, discutient, and spirituous remedies.

When an aponeurotic part (for example, the fascia of the fore-arm) is wounded, the patient sometimes experiences a more violent pain than usual, especially when he moves the limb; and this he feels presently after the blood-letting has been performed. A compress, moistened with cold Goulard's water, &c. is of service, whilst at the same time the bandage is left applied for three or four days, and the limb kept completely at rest, and wetted many times a day with such remedies. When this is neglected, there very often takes place a serious inflammation, which must be treated according to the antiphlogistic plan. Repose of the limb, which is to be kept in a bent position, and relaxation of the inflamed parts by means of warm emollient applications, are absolutely necessary. As soon as the inflammation abates, it is proper every day to attempt moving the joints, in order to prevent a stiffness. But if the tension and inflammatory symptoms run very high, it may even be requisite to divide the fascia completely.

When a nerve is injured, the patient experiences a still more violent pain, which extends itself throughout the whole limb, and the patient is also apt to faint; the muscles of the affected part contract, and the blood sometimes does not flow so freely as usual, although the vein has been well opened. The orifice of the vein does not become violently inflamed, and the pain continues. In order to prevent inflammation and other symptoms, a larger quantity of blood must be let run out, the limb must at least for some days be left completely at rest, and we must take care that the muscles of the part remain as much relaxed as possible. Moreover,

over, we must treat the patient antiphlogistically, prescribe a spare diet, and also, if the case should require it, administer opiates and laxatives. For lesions of the nerves, the application of warm spirit of turpentine is commended; but it would probably be useful only in case the nerve should lie above, but hardly when under, the vein. Over the orifice we apply some lint and a mild plaister, and over this and the whole limb, emollient and discutient cataplasms, with which anodyne remedies are mixed.

If, notwithstanding this treatment, the symptoms should become more violent, the lips of the wound acquire a hardness, and become more inflamed, affected with pain and tumour, with a full and quick pulse, blood must be drawn by leeches, or at another place by venesection. Instead of the warm emollient fomentations and cataplasms, which are recommended in such cases, Mr. B. Bell extols, from his own experience, cooling astringent remedies. Preparations of lead he has found most serviceable. The parts which suffer the most may be covered alternately with cloths wetted with a solution of saccharum Saturni, and with pledgits spread with ceratum Saturni. The fever must also be particularly attended to, and the above mentioned cooling treatment continued. When the pains are so violent, that they entirely deprive the patient of sleep and rest, we must use antimony and opium; but in order that the opium may prove serviceable, it is administered always in considerable doses. The limb must be also kept continually at rest, and in a horizontal posture.

But frequently the first affection is neglected, or improper remedies are employed, so that opium, and all the remedies that have been mentioned, have not the smallest effect. This is particularly to be supposed, when the nerve is cut in such a manner, that only a part of its fibres still remains entire, and these are preternaturally stretched; in which case the whole body suffers, and the most violent convulsive affections take place, which indicate the most imminent danger. The only remedy under these circumstances is the division of the nerve by a transverse incision above the inflamed part, that is to say, higher than the orifice of the vein. As the nerve certainly lies within the breadth of the orifice of the vein, the incision needs not be long, and it must penetrate only down to the fascia of the fore-arm, for all its cutaneous branches always lie on the outside of this fascia.

Mr. Benjamin Bell has given very extraordinary directions on this subject, which have (most unaccountably) been transcribed by many surgeons in France and Germany: he directs, among other things, an extensive transverse incision to be made through the original wound, and even down to the bone! which Mr. Abernethy has very properly reprobated as "dangerous and unnecessary."

When the branch of an artery has been wounded, the patient does not feel more pain than usual; but the surgeon immediately concludes from the colour and spouting of the blood what fault he has committed. See ANEURISM.

In venesection, a bone may also be injured, chiefly with lean persons, who generally have very thin veins, especially on the feet; which though they are very visible, lie, however, so close upon the bones and tendons, that the instrument passes through and injures the subjacent bone. In most cases, this only occasions a pain which the patient feels during the operation, and no bad consequences ensue. Frequently the surgeon himself would not know it, did he not find, on examining the instrument, that the point is entirely wanting, or at least bent round, and its edge spoiled. This, however, applies only to the case where none of the iron is left in it; but when this happens the case is worse. We may know, that it has taken place from the cutting blade being wanting, or in part broken off; from the pain which the patient feels, and which is generally of a pulsating kind; from the divided stream of the blood; from the feel with the fingers, when they are stroked over the orifice of the vein, and from the rebounding which the surgeon feels in the fingers at the stroke. If it is not seated very firmly, the stream of blood generally drives it out, if we draw the orifice gently asunder with two fingers. But when it is more firmly seated, we must endeavour to draw it out with a fine pair of forceps as cautiously as possible, that it may not break in extracting, and the point remain sticking in the bone. When it has been successfully extracted, we must endeavour to prevent the symptoms, such as inflammation, tumour, &c. by moistening the compress and the bandages with a discutient lotion, and afterwards also keep the bandages moistened with such remedies throughout the day. This accident is only liable to occur in using the phleme.

But the breaking off the blade may also happen with muscular subjects, and this the surgeon can certainly in general prevent, by always inspecting his instruments carefully, and providing them with good blades. The best blades are those which are very sharp and finely polished, and these are generally very thin, and consequently most liable to fly off. Before we use any blade, especially a thin one, we ought always to put it to the following test. We screw the new blade into the phleme, and let it fly two or three times without any object opposed to it. If the blade remains as it should, we are then so much the more secure against its flying off in blood-letting, because it has a resistance opposed to it. This precaution should never be neglected, and the loss of a few blades should not be regarded, in order to secure ourselves against the danger to which we are exposed if we neglect it. These observations and precautions will scarcely be wanted for *English* surgeons, who have laid aside that instrument.

Sometimes a lymphatic vessel is wounded; in which case the patient experiences no extraordinary pain, nor does the surgeon foresee the injury that is still to arise, and consequently cannot be immediately discovered. After the bandaging, the vein heals up, no inflammation is left behind, but there daily flows out of the orifice of the skin a quantity of clear pellucid lymph, which continually keeps the dressings wet. This circumstance often gives the surgeon much trouble. Here we may apply with advantage, Goulard's saturnine water, or a solution of alum, or mere cold water. The cure is best completed by means of dry lint, applied daily once or twice in the form of a tent. We may also sprinkle pulverized alum, or apply a strong pressure upon the vessel; and sometimes we may use the lapis infernalis with advantage. Mr. Jaeger, however, thinks (Funfzig. chirurg. prakt. Cantelen. &c. Frankf. a M. 1788, p. 3.) that the cure may most speedily be effected by immediately promoting suppuration.

It may happen, that in letting blood at the arm a lymphatic vessel becomes inflamed; in which case we feel upon examination, a hard absorbent vessel both above and below the wound of the vein, which last, however, is not yet healed, but generally uninflamed: if the affected limb is used, the pains become more violent, and sometimes extend themselves into the axilla, where also the glands swell; generally the fore arm likewise swells and becomes painful, and at last abscesses take place in different parts. Besides keeping the affected arm at rest, we must cover the wound with an emollient ointment, and apply to the hard vessels and tumours, cataplasms of emollient, discutient, and anodyne remedies, upon which they are generally discussed. When abscesses have already been formed, they must be opened and healed, according to the rules of the art. See ABSCESS.

The

The moſt common ſymptom conſequent upon blood-letting is fainting, which, however, is in moſt caſes unattended with danger, eſpecially when it does not ariſe from a too copious evacuation of blood. It may often be prevented, by keeping the patient engaged in converſation, by letting him take a ſpoonful of vinegar, or a glaſs of cold water into his mouth, or ſprinkling him and waſhing his hands and face with it. But if it nevertheleſs ſupervenes, we muſt immediately place the patient in a horizontal poſition, throw open the chamber window, and apply ſtrong ſtimulating ſubſtances, ſuch as volatile alkali, to his noſtrils; and when he has come to himſelf, we may give him a glaſs of wine, provided it be not contra-indicated by his ill ſtate of health.

With perſons who always faint whenever they are bled, and who on this account, however neceſſary the operation may be for them, always dread it, the beſt method of preventing their fainting, is to lay them immediately in a horizontal poſition, with the head low, and at the ſame time frequently to ſtop the diſcharge of blood by holding the vein. This caution is particularly to be recommended with pregnant women, as faintings and convulſions in them, if they continue too long, may prove very injurious to the fœtus, or produce abortion.

We have hitherto confined our remarks to the opening of a VEIN: it therefore now remains for us to deſcribe the operation of ARTERIOTOMY, which is the artificial opening of an ARTERY.

This operation was very frequently practiſed by the ancients; who, perhaps, from having incorrect ideas of the nature of theſe blood-veſſels, were not always aware of the dangerous conſequences which follow from this practice, if injudiciouſly managed. Thoſe who are deſirous of reading a full account of the ancient practice in this branch of ſurgery, may peruſe what Oribaſius has collected from Galen and Antyllus; to which they may add the obſervations of Paulus Ægineta, and Proſper Alpinus, the latter of whom deſcribes the operation as it was performed in Egypt.

The ſuppoſed advantages of opening an artery, rather than a vein, are 1ſt, that the blood flows with greater velocity than from a vein; and therefore affords a larger quantity in a given time: 2dly, that it prevents the accumulation of blood in any local inflammation more effectually, becauſe it intercepts the fluid in its paſſage towards the affected part: 3dly, that its ſalutary effects more ſpeedily follow, on this account, than from the operation of phlebotomy; and, therefore, it is preferable in caſes of a very urgent nature, ſuch as apoplexy and phrenitis, ariſing from the preſſure of blood upon the brain.

But theſe advantages are ſpeculative, rather than practical, for the following reaſons: 1ſt, No ſurgeon who is acquainted with the ſerious conſequences of opening a large branch of an artery, and the difficulty of reſtraining the effuſion of blood in many inſtances, will perform this operation in the ſame parts of the body, and in the ſame dauntleſs manner, as the ancients did. And in opening only very ſmall branches, (ſuppoſe of the temporal artery,) it rarely happens that the blood flows rapidly, and never with the ſame freedom as it does from a large vein: 2dly, That we may ſometimes, by this means, intercept the blood as it paſſes towards an inflamed part is certain, by cutting through the principal artery which conveys the blood; but this advantage is not often obtained, becauſe we dare not divide any conſiderable ramification, and there are always more arterial branches than one to ſupply an important organ: 3dly, We admit, that in certain caſes, (in ophthalmia, or inflammation of the eyes, for example,) the good effects of blood-letting by arteriotomy near the affected part, is far more uſeful than by phlebotomy, in a remote part; but, unfortunately, the ſurgeon cannot always evacuate a ſufficient quantity of blood by this means, on account of the difficulty of finding a ſuitable branch of an artery, which may be eaſily as well as ſafely inciſed.

Therefore, conſidering all the diſadvantages of this operation, it is now very rarely practiſed, except in the temples, where the pulſation of a ſmall branch of the artery may be often felt with eaſe; and there is little or no danger in attempting to divide it. If we do not ſucceed in our attempts, or do not procure ſo much blood as is requiſite, the operation of phlebotomy may then be had recourſe to. It ſhould, however, be mentioned as an undoubted fact, that acute inflammations of the eyes, are more effectually relieved by arteriotomy, (when it properly ſucceeds,) than by opening a vein in the arm; and that the excretion of four ounces of blood in this way, is as uſeful as twenty or even thirty ounces taken from the venous ſyſtem!

As arteriotomy is now ſcarcely ever performed in any other part of the body beſides the temple, we ſhall content ourſelves with deſcribing this operation alone. In that ſituation, the artery lies near enough upon the cranium to be compreſſed readily, when we wiſh to ſtop the current of blood; though, in general, the blood does not flow ſo freely, as to cauſe any difficulty in reſtraining it by moderate preſſure.

The patient being placed in a good light, the operator feels for a pulſating veſſel in the temple, nearly oppoſite the outer angle of the eye. When he has diſcovered it, he endeavours to trace the direction in which it runs; and then he places the two foremoſt fingers of his left hand upon the artery, leaving a ſpace of about half an inch between them for the place of the inciſion. The veſſel is ſo ſmall, in general, that it cannot be opened by an oblique, or a longitudinal puncture, as in bleeding the veins of the arm; but muſt uſually be cut acroſs, by a ſingle ſtroke of the lancet, or ſcalpel. A lancet is not ſo convenient as a ſmall knife for this purpoſe, becauſe its fine point is apt to be broken; and it will be found beſt to draw the inſtrument over the artery, inſtead of endeavouring to ſtrike it with the point, (which Dr. Butter, Mr. B. Bell, and others, direct to be done,) as in phlebotomy. It may be convenient to make a little impreſſion with the finger-nail, or with ink, on the exact ſpot we determine upon for the inciſion, leſt we loſe our object in operating; for a ſurgeon cannot always enſure the diviſion or wounding of the artery on his firſt attempt, eſpecially if the inciſion be made with timidity, or heſitation.

When a ſufficient quantity of blood has flowed, (which it does by a florid and ſalient ſtream,) we cloſe the wound; and apply a long bandage over a very firm, thick compreſs of linen, in which may be included a piece of coin, or ſome other hard ſubſtance. It is a matter of ſmall importance whether or no we firſt uſe an adheſive plaiſter, except when the bleeding is likely to prove troubleſome: but the different modes of arreſting arterial hæmorrhages, are deſcribed under the articles HÆMORRHAGE, LIGATURE, STYPTIC, and ANEURISM.

Frequently it is neceſſary that the ſurgeon ſhould make himſelf acquainted with the ſtate of the blood, and often alſo it is required of him to paſs his opinion upon it. As long as the blood is warm and flows out of the vein, it exhibits a pretty uniform red colour, and has a viſcid gluey feel; but when it grows cool, it coagulates into a maſs varying in colour and denſity. After ſome hours, there gradually exudes from this coagulated maſs a fluid, which ſeparates the more ſolid parts from the ſides of the veſſel, ſo that it ſwims in it. This water is called *ſerum*, but the coagulated red cake is named *cruor* or *craſſamentum*.

Good

Good venous blood, expofed to the air, is of a dark red colour: when it cools, it feparates a thin and almoft colourlefs ferum, and a thick cake, which has no cruft of a different colour from the blood below it; and of which the ferum forms a proportion, amounting to between the third part and the half. Such blood has no preternatural acrimony, or faline quality; and in it are found all its conftituent parts in the proper proportions. From this condition of the healthy blood, we may form a judgment of its preternatural ftate, if it be materially changed.

When the blood remains fo fluid that it will not coagulate, in indicates a deficiency of the gelatinous part, and a great redundance of ferum. Such blood is to be found in many fevers, efpecially in malignant ones, or when the patient is in a very debilitated condition.

If there be too much ferum in the blood, dropfy and other fimilar difeafes are to be apprehended; for fuch diffolved blood always indicates a weaknefs of the veffels, and of the mufcular fibre.

When the ferum is yellow, it indicates an obftructed flow of the bile, and its regurgitation into the mafs of the circulating fluids.

When the blood has much ferum and little of the red part, the blood is overloaded with mucus, and it indicates that a cachectic difeafe is impending; efpecially when the ferum has various different colours, and the texture of the cruor is very flender.

If the blood has its proper and fufficient rednefs and fluidity, but at the fame time exhibits a greafy pellicle, it indicates a fuperfluity of oleaginous particles.

When it feparates and yields a very compact, tenacious, yellow, or buffy furface, it is too thick; and if the ferum be at the fame time fmall in quality, it fhews a great degree of vafcular action and inflammation. This is a fact very generally admitted.

Finally, it is to be obferved, that we need not be alarmed when the thicker part of the blood feems to fwim in a milky fluid; for it commonly happens, in drawing blood only a few hours after a meal, when it proceeds from the chyle, which, about this time, is imperfectly mixed with the blood.

We have thrown out thefe few hints for the attention of practical furgeons; but they are by no means to be regarded as complete, or abfolutely incontrovertible. There is a great deal of fallacy in judging from the colour, and other fenfible qualities of the blood; and the moderns have, therefore, learnt to give their opinion with diffidence. This fubject is confidered more at large in a fubfequent article. See BLOOD, and its properties.

BLEEDING *a Horfe*, a frequent operation in the *Veterinary Art*, principally intended to diminifh the mafs of blood, and thereby deftroy the too great fulnefs or over-action of the heart and arteries.

When this operation is intended to affect the general fyftem, the evacuation is ufually made from the jugular vein. For the relief of particular parts, the veffels which belong to it, or which are adjacent to it, may be opened; as the vein running down the infide of the fore-arm is commonly opened when it is conceived the fhoulder is affected: the neceffity of this operation, on account of injuries of this part, is lefs frequent than is generally imagined; the vein itfelf in general gives out but little blood, and is very apt to fwell after the operation.

Affections of the feet are more frequent, and we have often opened the coronary veins with obvious good effects; by puncturing with a lancet various parts of the coronary ring, the blood flows copiouffy, and at length ftops of itfelf without the leaft ill confequences.

The vein which encircles the coffin bone is alfo, without much difficulty, opened in inflammations of this part: the blood flows freely, the artery which accompanies it being in general opened along with it. It is neceffary in performing this operation, to remove the horn covering the veffels with a drawing knife till the blood flows in fufficient abundance. The horn round the point of fection fhould be thinned confiderably, to prevent irritation, and mild refinous dreffings fhould afterwards be laid over the part, to exclude the air, &c.

This operation we have heard condemned by fome, as producing ill confequences, and a fore difficult to heal. We have only to remark, after having frequently performed it, we have not met with an inftance of thefe ill effects following it.

The angular veins of the eye are often opened with good effects in inflammations of this part, as alfo the veffels which are feen paffing over the fclerotic coats of the eye, and over the duplicature of the *membrana conjunctiva* on the infide of the eye-lids, both of which admit of eafy fection with the lancet.

The *temporal* artery alfo prefents itfelf very conveniently for opening in the horfe; and in inflammations of the brain, or its coverings, or where a fudden depletion of the fyftem is defired, it is productive of manifeft good effect. If this veffel fhould bleed too freely, and apprehenfions are entertained of the lofs of too much blood, it is moft eafily ftopped by preffure, or by a deep incifion, which completely fevers the veffel; in this cafe its ends foon retracting, ftop the farther effufion of blood.

The veins of the palate are conveniently fituated for opening by making a tranfverfe incifion in this part with a lancet, and this is often had recourfe to in the relaxation of the palate, termed lampers, and with apparently good effect. Some are deterred from the operation, by having experienced a difficulty in ftopping the flow of blood; a circumftance that in a few times when we have performed this operation, has not occurred to us.

We fhall now briefly ftate the mode of operating, and the confequences which fometimes follow the opening of the jugular vein in horfes.

It is moft ufual to bleed with the fleam, or the lancet; the former on account of the thicknefs of the fkin of the horfe, and the refiftance afforded by the hair, is generally had recourfe to. It is alfo next to impoffible to drive the blade into the neck fo deep at to be injurious, on account of the fhoulder to which it is affixed; it is perhaps, on this account, the fafeft and moft certain inftrument, efpecially in the hand of grooms and helpers in ftables, as it cannot be much abufed. In the ftructure of it, the back fhould be particularly attended to, for in general this is too narrow, infomuch, that the inftrument being ftruck, it finks into the channel of the vein, the prominent mufcles of the neck receive the ftroke, and the vein is not opened. To remedy this, which is a very common inconvenience, the back of the fleam fhould be at leaft three quarters of an inch broad, in which cafe the operation very rarely fails.

The lancet is alfo very convenient in thin fkinned horfes, and performs the operation very well. It requires, however, on account of the refiftance of the fkin and hair, to be ufed rather boldly, as to the length it is prefented with, and the force employed, at leaft when a copious flow of blood is defired.

It is ufual to wet the hairs over the part intended to be punctured,

punctured, and then if they are drawn parallel to the direction of the vein, the lancet paſſing between them, there is leſs reſiſtance than if they preſented themſelves tranſverſely to the blade, in which caſe they muſt neceſſarily be divided before the inciſion can take place.

The jugular vein, after bleeding, often ulcerates, and is attended with the moſt ſerious ill conſequences, the miſchief extending in both directions along the internal ſurface of the vein, from the point of the inciſion; the cavity of the vein, or its canal, becomes obliterated, and the irritation occaſions a thickening of the cellular membrane ſurrounding the vein, often to ſome inches in depth. This, in general, if no external irritation happens, ſubſides gradually, and diſappears without any farther ill conſequences, and the vein is totally loſt on that ſide: at other times, an oozing and diſcharge of thin lymph takes place from the injured part, and a ſinus forms, running moſtly againſt the courſe of the vein up the neck, which, being freely opened, ſoon heals without farther inconvenience. At other times, conſiderable abſceſſes form, which are opened without danger, and the thickening of the cellular membrane gradually ſubſides, and the part heals. Again, in others, the inflammation and ulceration extend along the courſe of the vein to the head, forming abſceſſes, which burſt and diſcharge blood, and the ulceration extending to the head becomes fatal.

As prevention is often much eaſier than cure, to avoid this accident great care ſhould be taken to uſe a clean inſtrument, with a ſmooth, keen edge, not to ſtrike where the vein has been already opened, where very often is an enlargment, and the vein becomes thinner in that part, and more extended, not to include any thing but the ſkin in pinning it up, and not to leave the pin remaining in the neck too long, to become cankered and ruſty, and thus produce irritation. The pin ſhould be clipt as ſhort as poſſible, to prevent the horſe rubbing it out againſt the manger, &c.

The wound will in general cloſe of itſelf after a few minutes, if all preſſure upon the vein be removed, and ſufficiently firm to ſtop the eſcape of the blood, if the lips of the orifice are preſſed together, without any pinning, and the horſe's head, to render it more certain, ſhould be tied rather high to the rack for a ſhort time; where, however, the orifice is very large, or the veins very tumid, and diſpoſed to bleed, pinning is the ſureſt practice.

Lancets are often made with a ſpring, ſuddenly to plunge them into the vein, and are uſefully and commodiouſly employed for this operation, as they do it with great ſuddenneſs and effect, more ſo than the hand or the blow of a bloodſtick. The only objection is, that the inſtrument, from the preſſure againſt the neck required in uſing it, cannot be ſo ſuddenly withdrawn as might be deſirable, ſo that if the horſe plunges at the moment he might ſeverely cut himſelf, which we have ſeen happen. To prevent the poſſibility of ſuch an occurrence, the inſtrument might be provided with a ſecond ſpring to bring back the lancet to its ſheath, or caſe, immediately after the ſtroke, which would render this inſtrument very uſeful and perfect.

Bleeding *from the noſe*. See Epistaxis.

Bleeding *from the lungs*. See Hæmoptysis.

Bleeding *by meaſure*, is where an account is taken of the quantity as it flows from the vein, in order to put a ſtop to the flux when the requiſite portion is had.

Bleeding *at large*, where the flux is continued without regard to the quantity, till ſuch time as ſome expected effect is perceived. This method is ſometimes uſed in caſes of apoplexies, comata, &c.

Bleeding *of a corpſe*, *cruentatio cadaveris*, is a phenomenon ſaid to have frequently happened in the bodies of perſons murdered, which, on the touch, or even approach of the murderer, began to bleed at the noſe, ears, and other parts; ſo as formerly to be admitted in England, and ſtill allowed in ſome other parts, as a ſort of detection of the criminal, and proof of the fact. Phil. Tranſ. N° 77. p. 3012. But this kind of evidence derives its weight merely from ſuperſtition and credulity. Numerous inſtances of theſe poſthumous hæmorrhages are given by Webſter, Lemnius, Libavius, and eſpecially Horſtius, who has a diſcourſe expreſs on this point, under the title, "De Cruentatione Cadaverum."

Bleeding is alſo applied, in a leſs proper ſenſe, to a flux of ſap out of the wounded veſſels of plants, either ſpontaneouſly at certain ſeaſons, or by art, and the help of inciſion.

BLEGNY, Nicolas, in *Biography*, a bold, and, for a time, ſucceſsful adventurer in medicine, to which he was not regularly educated. Dionis ſays, he married a midwife, which probably firſt ſuggeſted the idea of becoming a rupture doctor, and of contriving an elaſtic bandage for that complaint. In 1676, he publiſhed at Paris, "L'art de guerir des hernies," 12mo. which has paſſed through ſeveral editions. He uſed to cauterize the ſkin of the groin with aqua fortis, or the muriatic acid; when the wound healed, a firm cicatrix was left, which contributed in preventing the further deſcent of the gut. This remedy was invented by the prior De Cabeveres. He relates ſeveral remarkable cures performed by him: in one caſe, part of the urinary bladder had ſlipped into the ring. In 1679 he publiſhed, "Hiſtoire anatomique d'un enfant, qui a demeuré vingt cinque ans dans le ventre de ſa mere," Paris, 12mo. The fœtus was ſaid to be petrified. It had acquired, from its long reſidence in the abdomen, and from the preſſure of the neighbouring viſcera, an almoſt cartilaginous hardneſs, and retained very little of the human form. About the ſame time, he commenced the publication of a medical journal, under the title of "Les nouvelles decouvertes, ſur toutes les parties de la medicine," of which one number came out every month, and he ſolicited and obtained aſſiſtance from a variety of practitioners; he alſo contributed conſiderably to it from his own ſtock. His name appeared as the editor for the firſt three years, but was afterwards omitted. Bouet thought the journal deſerving of being tranſlated into Latin, and publiſhed it at Geneva, in 4to. under the title of "Zodiaci medico-Gallici." He had before this made himſelf known by a treatiſe on the venereal diſeaſe; "L'Art de guerir les maladies veneriennes expliqué par les principes de la nature, et de la mecanique," 12mo. 2 vols. Paris. This was ſoon republiſhed, tranſlated into German, Engliſh, and other languages. He ſays, the diſeaſe was known to the ancients, and even to Moſes. It may be brought on, he thinks, by immoderate venery. He objects to the uſe of aſtringent injections in the gonorrhœa, and profeſſes to cure the lues, equally certainly, and more ſafely, with decoctions of guiacum and ſarſaparilla, than with mercury. He had alſo publiſhed, by order of his ſovereign, "Remede Anglois, pour la gueriſon des fievres," 1682, 12mo. The principal part of this remedy was the Peruvian bark. He had now attained to very high rank in his profeſſion, having been made, in ſucceſſion, ſurgeon to the queen, to Philip duke of Orleans, and, in 1687, one of the phyſicians in ordinary to the king. Soon after he undertook the management of an hoſpital, for the reception of the ſick poor at Pincourt, but for ſome immoral practices, encouraged in this place, a report of which was made to the king, he was removed from all his appointments,

and confined in prison for eight years. Released at length from his confinement, he went and settled at Avignon, where he continued to the time of his death, about the year 1722, being 70 years of age. Haller. Bib. Chirurg. Anat. et Med. Eloy Dict. Hist.

BLEICHERODE, in *Geography*, a town of Germany, in the circle of Upper Saxony, county of Hohenstein, and lordship of Lora; though small, it is populous and thriving, has some manufactures, and carries on a good trade; 20 miles north of Mulhausen.

BLEIDENSTATT, a town, or large village of Germany, in the circle of the Upper Rhine, and principality of Nassau-Saarbruck-Usingen, seated on the Aar, 9 miles N.N.W. of Mentz.

BLEISTEIN, or Plestain, a town of Germany, in the circle of Bavaria, and principality of Newburg, with an annexed lordship, a fief of the kingdom of Bohemia; 22 miles E. N. E. of Amberg.

BLEKEDE, a small town of Germany, in the circle of Lower Saxony, and principality of Luneburg-Zell, seated on the Elbe, to which belongs a toll on the river of considerable produce; 20 miles E. N. E. of Luneburg.

BLEKINGEN, called by the Swedes *Blekingh*, by the Danes *Blegind*, and by the inhabitants *Blegen*, a province of Sweden, bounded on the north by Smoland, on the south and east by the Baltic, and on the west by Scania, Schonen, or Skone, is about 100 English miles in length, and about 26 in breadth. It is a mountainous country, but various parts of it are more pleasant than any other provinces of the kingdom. It abounds with forests of oak, beech, pine, and birch trees, and carries on a considerable trade in pot-ash, tar, tallow, hides, leather, beams, deal-boards, and masts. The inhabitants also employ themselves in fishing and hunting. The shallow soil does not admit of much tillage, but the pastures afford the best cheese in Sweden; the cattle, however, are of a smaller size than those of Schonen. This country has several lakes and six principal rivers, which furnish good salmon. Its islands belonging to this jurisdiction are numerous, and the whole province contains 29 parishes. The clergy are subject to the see of Lund. As to its political division it consists of four harads, or districts, and its principal town is Carlscrona, which see.

BLEMISH, in *Horse-dealing*. By this term, among the venders of horses, is understood any appearance by which the horse is disfigured, as broken knees, a blind eye, scars of various kinds, &c. The term blemish, by some, may be extended even to any unsightly natural markings of the horse. These blemishes, however, for the most part, are considered as in no wise of themselves constituting an unsoundness.

Blemish, a term in *Hunting*, used when the hounds, or beagles, finding where the chace has been, make a proffer to enter, but return.

BLEMMYES, or Blemyes, among the *Ancient Geographers*, a fabulous sort of people, supposed without heads; having eyes and mouths on their breasts; said to have inhabited part of Ethiopia, on the borders of Egypt.

Some authors imagine, that this fable had its origin in a custom which prevailed among this people of depressing their heads between their shoulders, which they forced upwards, so that their necks were very short, and their heads were concealed partly by their shoulders, and partly by their long and thick hair. To this purpose it is alleged, that the Egyptian, or bearded Bacchus, has the head sunk in his breast. We learn from Vopiscus, that some Blemmyan captives, taken prisoners by Probus, in an expedition against them, about the year of Christ 278, made a very odd appearance at Rome. But at this time they could not be quite unknown at Rome, as some of them had appeared there before, on occasion of Aurelian's triumph. In the time of Diocleſian, the number of the Blemmyes, scattered between the island of Meroe and the Red sea, was very inconsiderable, their disposition was unwarlike, and their weapons rude and inoffensive; yet, in the public disorders, these barbarians, whom antiquity, shocked with the deformity of their figure, had almost excluded from the human species, presumed to rank themselves among the enemies of Rome. With a view of opposing to the Blemmyes a suitable adversary, Diocleſian, in his attack on the rebellious Egyptians, A.D. 296, persuaded the Nobatæ, or people of Nubia, to remove from their ancient habitations in the deserts of Libya, and resigned to them an extensive but unprofitable territory above Syene, and the cataracts of the Nile, with the stipulation, that they should ever respect and guard the frontier of the empire. We find, however, that at a subsequent period they sent ambassadors to the court of Constantine. The Blemmyes were subdued by Florus, the lieutenant of Marcian, A. D. 450.

Bochart derives the word *Blemmyes* from בלי, which implies a *negation*, and מוח, *brain*; in which sense, the Blemmyes should have been people without brains. See Strabo, l. xvii. p. 1. 172. Pomponius Mela, l. 1. c. 4. His words, in describing these savages of Ethiopia, are curious; "Intra, si credere libet, vix homines magisque semiferi; Ægipanes, et *Blemmyes*, et Satyri."

BLENAU, in *Geography*, a town of France, in the department of the Yonne, and chief place of a canton in the district of Ioigny, containing 1065 persons; the number of people in the canton amounts to 5976: the territory comprehends 290 kiliometres and 9 communes; 2 leagues N.W. of St. Fargeau.

BLENCH, in *Law*, a sort of tenure of land; as to hold land in blench is by payment of a sugar-loaf, a couple of capons, a beaver-hat, &c. if the same be demanded in the name of *blench*, i. e. *nomine albæ firmæ*. See Alba Firma.

BLENDE, in *Mineralogy*, called also black-jack, or pseudo-galena, the native sulphuret of zinc. See Zinc, *ores of*.

Blend-*metal-iron*, a coarse sort of iron from the Staffordshire mines, used for making nails and heavy ware; in some places also for horse-shoes.

Blend-*water*, a distemper incident to black-cattle, which comes several ways. 1. From blood. 2. From the yellows, which is a ringleader of all diseases. And 3. From the change of ground: for being hard, it is apt to breed this evil, which if not remedied in six days, will be past help.

BLENHEIM, in *Geography*, a village of Germany, in the circle of Bavaria, and principality of Newburg, 2 miles N. E. of Hockstedt, famous for a victory obtained there by the English and their allies over the French and Bavarians, August 13th 1704. For an account of the battle, see Hockstedt.

Blenheim, a new town of America, in the state of New York, in Schoharie county, incorporated in 1797.

BLENNA, or Blena (βλεννα) in *Medicine*, a term used by Hippocrates, and subsequent medical writers, to denote a phlegm or mucus excreted from the nostrils. This sort of excretion occurs not unfrequently in acute diseases, and is generally a favourable symptom.

BLENNIUS, in *Ichthyology*, a Linnæan genus of jugular fishes,

Steph. Byz. to have derived its name from one of the companions of Cadmus.

BLIEGG, in *Ichthyology*, a name given by the Germans to the fish we call the *bleak*. See BLEAK, and ALBURNUS.

BLIESCASTEL, in *Geography*, a town of France, in the department of Sarre, and chief place of a canton, in the district of Sarrebruck; containing 1278 inhabitants; the population of the canton includes 10,084 persons; and the territory has 30 communes.

BLIESNA SALENSI, a harbour on the coast of Lapland, between the river Kola and Kilduyn island.

BLIGH's *Cap*, a name given by captain Cook, on account of its shape, to an island in the southern Pacific ocean, near Kerguelen's land, before called by Kerguelen "the island of Rendezvous." It is a high round rock accessible only to birds. S. lat. 48° 29'. E. long. 68° 40'.

BLIGHT, in *Agriculture*, a general name for various distempers incident to corn and fruit-trees.

It affects them variously, the whole plant sometimes perishing by it, and sometimes only the leaves and blossoms, which will be scorched and shrivelled up, the rest remaining green and flourishing. Some have supposed, that blights are produced by easterly winds, which bring vast quantities of insects' eggs along with them from distant places. These being lodged upon the surface of the leaves and flowers of fruit-trees, cause them to shrivel up and perish.

Mr. Knight, however, observes, that blights are produced by a variety of causes; by insects, by an excess of heat or cold, of drought or moisture; for these necessarily derange and destroy the delicate organization of the blossoms; but he believes the common opinion, that they arise from some latent noxious quality in the air, or from lightning, to be totally unfounded. The term blight is very frequently used by the gardener and farmer, he remarks, without any definite idea being annexed to it. If the leaves of their trees be eaten by the caterpillar, or contracted by the aphis; if the blossoms fall from the ravages of insects, or without any apparent cause, the trees are equally blighted, and if an east wind happen to have blown, the insects, or at least their eggs, whatever be their size, are supposed to have been brought by it. See APHIS.

The true cause of blights seems to be, continued dry easterly winds for several days together, without the intervention of showers, or any morning dew, by which the perspiration in the tender blossom is stopped; and if it so happen that there is a long continuance of the same weather, it equally affects the tender leaves, whereby their colour is changed, and they wither and decay.

The best remedy, perhaps, is gently to wash and sprinkle over the tree, &c. from time to time, with common water; and if the young shoots seem to be much infected, let them be washed with a woollen cloth, so as to clear them, if possible, from this glutinous matter, that their respiration and perspiration may not be obstructed. This operation ought to be performed early in the day, that the moisture may be exhaled before the cold of the night comes on: nor should it be done when the sun shines very hot. Mr. Forsyth recommends their being washed well with urine and soap-suds, as soon as possible after the disease appears.

Another cause of blights in the spring, is said to be sharp, hoary frosts, which are often succeeded by hot sun-shine in the day-time. This is the most sudden and certain destroyer of fruit that is known. The chief remedy to be depended upon in this case is, that of protecting the fruit-trees during the night-time with nets. This mode, where regularly and correctly performed, has been found highly beneficial.

But, in order to cure this disease, some have advised the burning of wet litter on the windward side of the plants, in order that the smoke of it may be carried to them by the wind, which they suppose will stifle and destroy the insects, and thereby cure the mischief. Others direct the use of tobacco-dust, or the washing of the trees with water in which tobacco-stalks have been infused for twelve hours, which they say will destroy those insects, and recover the plants. Pepper-dust, scattered over the blossoms of fruit-trees, &c. has been recommended as very useful in this case; and there are some who advise the pulling off the leaves that are affected.

What is termed the blight is frequently, however, no more than a debility, or distemper in trees. Mr. Forsyth observes, that "this is the case when trees, against the same wall, and enjoying the same advantages in every respect, differ greatly in their health and vigour, the weak ones appearing to be continually blighted, while the others remain in a flourishing condition. This very great difference, in such circumstances, can be attributed only to the different constitutions of the trees, proceeding from want of proper nourishment, or from some bad qualities in the soil; some distemper in the stock, buds, or scions; or from some mismanagement in the pruning, &c. all of which are productive of distempers in trees, of which they are, with difficulty, cured. If the fault be in the soil, it must, he says, be dug out, and fresh mould put in its place; or, the trees must be taken up, and others, better adapted to the soil, planted in their room. It will be found absolutely necessary always to endeavour to suit the particular sorts of fruit to the nature of the soil; for it is in vain to expect all sorts of fruit to be good in the same soil. If the weakness of the tree proceed from an in-bred distemper, it will be adviseable to remove it at once, and after renewing the earth, to plant another in its place." But if the weakness is brought on by ill management in the pruning, which is frequently the case, he would advise more attention to the method of pruning and training.

Besides this, "there is another sort of blight that sometimes happens pretty late in the spring, as in April or May, which is very destructive to fruit-trees in orchards, and open plantations, and against which we know of no effectual remedy. This is what is called a *fire-blast*, which, in a few hours, hath not only destroyed the fruit and leaves, but often parts of trees; and sometimes entire trees have been killed by it." This, Mr. Forsyth observes, "is generally thought to be occasioned by certain transparent flying vapours, which may sometimes take such form, as to converge the sun's rays in the manner of a burning-glass, so as to scorch the plants they fall upon; and this, in a greater or less degree, in proportion to their convergency. As this generally happens in close plantations, where the vapours from the earth, and the perspiration from the trees, are pent in for want of a free circulation of air to disperse them, it points out to us the only way, yet known, of guarding against this enemy to fruits; namely, to make choice of a clear healthy situation for kitchen-gardens, orchards, &c. and to plant the trees at such a distance, as to give free admission to the air, that it may dispel those vapours before they are formed into such volumes as to occasion these blasts." But blasts may also be occasioned by the reflection of the sun's rays from hollow clouds, which sometimes act as burning mirrors, and occasion excessive heat. Against this there is no remedy yet discovered.

Mr. Marshall, in the Rural Economy of midland counties, observes, that it is well known that this disease is most injurious

jurious to grain crops in wet feafons; hence, principally, the fcarcity and advanced price of wheat after fuch feafons. It is alfo remarked to affect the north fide of fields, much more than the fouth, and that the effect is governed by the ftate of ripenefs; confequently, a few days of forwardnefs may be fufficient to prevent the effect. It is evident, that the forward wheats are leaft liable to be blighted; for, having paffed fome certain ftage of maturation, they become invulnerable to the attack of this mifchievous enemy; at leaft, no obvious injury is incurred. It is alfo obfervable, that no perceptible blight takes place while a dry feafon continues. The only guard a farmer has againft the attack of this fecret enemy appears to be that of fowing early.

Blight *of corn* is called Smut.

BLIGNY-SUR OUCHES, in *Geography*, a town of France, in the department of the Côte d'Or, and chief place of a canton, in the diftrict of Beaune, 3 leagues N.W. of Beaune, containing 1169 inhabitants; the canton contains 6598; and comprehends 265 kiliometres, and 23 communes.

BLIKOOSKOI, a fmall ifland in the Frozen fea. N. lat. 71° 30'. E. long. 125° 14'.

BLIND. See Blindness.

Blind, *Pore*, or *Pur*, denotes only a great degree of fhort-fightednefs. Phil. Tranf. N° 37. p. 731.

Blind, is alfo ufed for occult, or imperceptible. Hence blind rampart, *cæcum vallum*, among the ancients, was that befet with fharp ftakes, concealed by grafs or leaves growing over them.

Blind *teftimonies*, *cæca teftimonia*, thofe given by abfent perfons in writing.

Blind is alfo ufed in fpeaking of bodies without apertures.

Hence.

Blind *wall*, *cæcus paries*, that without windows. In a like fenfe we meet with *blind* chamber, *cæcum cubiculum*.

Blind is alfo ufed in fpeaking of veffels which are not perforated. In this fenfe the chemifts fay a blind alembic. A tube is faid to be blind, when it is clofed a-top. Some anatomifts alfo call the third cavity of the ear cæcum, as having no iffue; but it is more ufually denominated labyrinth, which fee.

Blind *harbour*, or *Murderer's bay* of Tafman, in *Geography*, a deep bay at the N.W. part of the fouthern ifland of New Zealand, having two fmall iflands near the bottom of it on the weft fide; 6 leagues to the eaft of cape Farewell.

Blind, in the *Military Art*, fignifies generally every material which ferves to cover and protect the befiegers from the fire of the enemy; as wool-packs, fand bags, earth-baftkets, &c. Blinds fometimes confift only of canvas ftretched, fo as to intercept the view of the garrifon from the walls. Sometimes they are planks erected, and in this cafe are more properly called mantlets. They are alfo occafionally conftructed with a number of baftkets or barrels.

More particularly taken, blinds denote wooden frames of four pieces, either round or flat. Two of them are fix feet long, and pointed at the extremities; the others, about three or four feet in length, ferve as fpars, to faften the two former together. Thefe blinds are fixed upright in the ground againft the fides of the faps, to hinder the earth from falling in, and to faften fafcines upon the upper part. They are likewife of ufe in covering the faps, and fupporting a roof of fafcines to fecure the troops from ftones and granades.

Blinds, of another fort are commonly made of oziers, or branches interwoven and laid acrofs between two rows of ftakes, about the height of a man, and four or five feet afunder.

Blinds are of effential fervice at the heads of trenches, or faps, when they are extended in front towards the glacis; and when, from the fuperior elevation of the enemy's works, he may overlook, and pour his fire in upon the befiegers. They are alfo indifpenfable, in cafe the nature of the ground fhould oblige the approaches to be carried on in a ftraight direction, and the workmen and the guard to be neceffarily expofed to the batteries of the garrifon. But in this cafe, the faps can only be carried on in the night, as the lofs of men would otherwife prove extremely ferious.

Blind is alfo fometimes ufed for Orillon.

Blind *granado*, that which does not light or take fire.

Blind *faith*. See Faith.

Blind *gut*. See Cœcum.

Blind *worm*. See Slow-*worm*.

BLINDING, a fpecies of corporal punifhment anciently inflicted on thieves, adulterers, perjurers, and others; and from which the ancient Chriftians were not exempt. Sometimes lime in vinegar, or barely fcalding vinegar, was poured into the eyes, till their balls were confumed; fometimes a rope was twifted round the head till the eyes ftarted out. Solin. Polyhift. c. 4. Lamprid. in Alex. Sev. c. 17. Val. Max. lib. vi. c. 5. Lactant. de Mort. Perfec. c. 36.

In the middle age, they changed total blindnefs for a great darknefs, or diminution of fight, which they produced by holding a red hot iron difh or bafon before the eyes, till their humours were dried, and their coats fhrivelled up.

The inhabitants of the city Apollonia executed it on their watch whom they found afleep. Democritus, according to Plutarch, Cicero, and A. Gellius, put out his own eyes, that he might be lefs difturbed in his mental contemplations, when thus freed from the diftraction of the objects of fight. Herodot. lib. vi. c. 92. Aul. Gell. Noct. Att. lib. x. c. 71. Cicero Tufc. Qu. 5.

Blinding, *obcæcatio*, in the *Black Art*, denotes a fpecies of necromancy, whereby a vifible body may be concealed, or hidden by an invifible power. See Necromancy.

Blinding *of a cafemate*, fignifies erecting a battery againft it, in order to difmount its cannon and render them ufelefs.

BLINDNESS, in *Surgery*, the privation or want of fight. This defect may arife from a variety of caufes, exifting either in the organ of fight, or in the circumftances neceffary to produce vifion. See Optics and Eye. Blindnefs will be complete, when the light is wholly excluded; or partial, when it is admitted into the eye fo imperfectly as to convey only a confufed perception of vifible objects. Blindnefs may again be diftinguifhed into periodical or permanent, tranfient or perpetual, natural or accidental, &c.; but thefe diftinctions do not ferve to communicate any idea of the caufes of blindnefs, which are to be flightly mentioned in the prefent article. For a more particular account of the caufes and remedies of blindnefs, the reader will confult the articles which give an account of the doctrine of vifion, and the difeafes of the eye.

The ordinary caufes of blindnefs are as follow:

1. *In the eyelids and mufcles.* By a cohefion of the eye lids; by an elongation of the upper eye-lid; by a paralytic ftate, which difables the patient from raifing it fufficiently; by an irregular or defective action in the mufcles which are attached to the eye-ball.

2. *In the membranes of the eye.* By their opacity, fo as to exclude the rays of light; by their exquifite fenfibility, fo as to render vifion intolerable; by their blood-veffels affuming a morbid action, and effufing a fluid (fuppofe pus, for example) into any of the cavities of the eye.

3. *In*

3. *In the humours of the eye.* By their defective quantity; by the turbid ſtate, or imperfectly tranſparent condition, of the humours; by the loſs of any one of them, through accident or violence; by an altered figure of the cryſtalline lens.

4. *In the brain or optic nerve.* By compreſſion, producing palſy or GUTTA SERENA (which ſee); by a ſtate of debility or inertneſs in the viſual organ, ſo as to require an uncommonly ſtrong light; by too great ſenſibility in the optic nerve, enduring but a very feeble impreſſion from the light, and tranſmitting only a confuſed perception of viſible objects to the mind; by ſome unknown change in the nervous power, cauſing depraved viſion, and exciting imaginary ſcenes, which no perſon can obſerve beſides the patient himſelf.

It has been generally ſuppoſed, that blind perſons have not any idea of viſible objects, though they can diſtinguiſh them by the touch: thus the gentleman couched by Mr. Cheſelden, though he knew the colours aſunder in a good light during his blind ſtate; yet when he ſaw them after couching, the faint ideas he had of them before, were not ſufficient for him to know them by afterwards. Phil. Tranſ. N° 403. p. 447.

It was even a conſiderable time before he could remember which was the cat and which the dog, though often informed, without feeling them. Add, that he had no idea of diſtance; but thought all the objects he ſaw touched his eyes, as what he felt did his ſkin.

But a caſe is recorded by Mr. Ware in the Philoſophical Tranſactions (read to the ſociety June 11th, 1801), which does not accord with Mr. Cheſelden's obſervation on this ſubject. It was the caſe of a young gentleman, who (by a ſurgical operation) recovered his ſight when ſeven years of age; after having been deprived of it by cataracts, before he was a year old. Mr. Ware gives the following account of the facts in queſtion: "I performed the operation on the left eye, on the 29th of December laſt, in the preſence of Mr. Chamberlayne, F.A.S. Dr. Bradley, of Baliol college, Oxford, and Mr. Platt, ſurgeon, in London. It is not neceſſary, in this place, to enter into a deſcription of the operation. It will be ſufficient to ſay, that the child, during its performance, neither uttered an exclamation, nor made the ſmalleſt motion, either with his head or hands. The eye was immediately bound up, and no inquiries made on that day with regard to his ſight. On the 30th, I found that he had experienced a ſlight ſickneſs on the preceding evening, but had made no complaint of pain, either in his head or eye. On the 31ſt, as ſoon as I entered his chamber, the mother, with much joy, informed me that her child could ſee.—About an hour before my viſit, he was ſtanding near the fire, with a handkerchief tied looſely over his eyes, when he told her that under the handkerchief, which had ſlipped upward, he could diſtinguiſh the table by the ſide of which ſhe was ſitting: it was about a yard and a half from him; and he obſerved that it was covered with a green cloth (which was really the caſe), and that it was a little farther off than he was able to reach. No further queſtions were aſked him at that time; as his mother was much alarmed, leſt the uſe thus made of his eye might have been premature and injurious. Upon examination, I found that it was not more inflamed than the other eye; and the opacity in the pupil did [illegible]ar to be much diminiſhed. Deſirous, however, to [illegible]n whether he was able to diſtinguiſh objects, I held [illegible] before him, at the diſtance of about twelve inches, [illegible] he told me, after a ſhort heſitation, that it was a piece [illegible]; that it was ſquare, which he knew by its corners; [illegible] it was longer in one direction than it was in the other. On being deſired to point to the corners, he did it with great preciſion, and readily carried his finger in the line of its longeſt diameter. I then ſhewed him a ſmall oblong band-box covered with red leather, which he ſaid was red and ſquare, and pointed at once to its four corners. After this, I placed before him an oval ſilver box, which he ſaid had a ſhining appearance; and, preſently afterwards, that it was round, becauſe it had not corners. The obſervation, however, which appeared to me moſt remarkable, was that which related to a white ſtone mug; which he firſt called a white baſon, but, ſoon after, recollecting himſelf, ſaid it was a mug, becauſe it had a handle. Theſe experiments did not give him any pain; and they were made in the preſence of his mother, and of Mr. Woodford, a clerk in his majeſty's treaſury. I held the objects at different diſtances from his eye, and inquired very particularly if he was ſenſible of any difference in their ſituation; which he always ſaid he was, informing me, on every change, whether they were brought nearer to, or carried further from him. I again inquired, both of his mother and himſelf, whether he had ever, before this time, diſtinguiſhed by ſight any ſort of object; and I was aſſured by both that he never had on any occaſion; and that when he wiſhed to diſcover colours, which he could only do when they were very ſtrong, he had always been obliged to hold the coloured object cloſe to his eye, and a little on one ſide, to avoid the projection of the noſe. No further experiments were made on that day. On the 1ſt of January, I found that his eye continued quite free both from pain and inflammation, and that he felt no uneaſineſs on the approach of light. I ſhewed him a table knife; which at firſt he called a ſpoon, but ſoon rectified the miſtake, giving it the right name, and diſtinguiſhing the blade from the handle, by pointing to each as he was deſired. He afterwards called a yellow pocket-book by its name, taking notice of the ſilver lock in the cover. I held my hand before him; which he knew, but could not at firſt tell the number of my fingers, nor diſtinguiſh one of them from another. I then held up his own hand, and deſired him to remark the difference between his thumb and fingers; after which he readily pointed out the diſtinctions in mine alſo. Dark-coloured and ſmooth objects, were more agreeable to him than thoſe which were bright and rough. On the 3d of January, he ſaw, from the drawing-room window, a dancing-bear in the ſtreet; and diſtinguiſhed a number of boys that were ſtanding round him, noticing particularly a bundle of cloths which one of them had on his head. On the ſame evening, I placed him before a looking-glaſs, and held up his hand: after a little time he ſmiled and ſaid he ſaw the ſhadow of his hand, as well as that of his head. He could not then diſtinguiſh his features; but, on the following day, his mother having again placed him before the glaſs, he pointed to his eyes, noſe, and mouth, and ſeemed much gratified with the ſight.

Having thus ſtated the principal obſervations that were made by Maſter W. I ſhall now make a brief compariſon between this ſtatement, and that which is given in the XXXVth volume of the Philoſophical Tranſactions, of M. Cheſelden's patient, who was ſuppoſed to be born blind, and obtained his ſight when he was between thirteen and fourteen years old.

It ſhould be obſerved, that though Maſter W. was ſix years younger than Mr. Cheſelden's patient, he was remarkably intelligent, and gave the moſt direct and ſatisfactory anſwers to every queſtion that was put to him. Both of them, alſo, if not born blind, loſt their ſight ſo very early, that, as Mr. Cheſelden expreſſes it, "they had not any recollection of having ever ſeen."

My first remark is, that, contrary to the experience of Mr. Chefelden's patient, who is ſtated "to have been ſo far from making any judgment of diſtance, that he thought all objects touched his eyes, as what he felt did his ſkin," Maſter W. diſtinguiſhed, as ſoon as he was able to ſee, a table, a yard and a half from him; and proved that he had ſome accuracy in his idea of diſtance, by ſaying, that it was a little further off than his hand could reach. This obſervation, ſo contrary to the account we have received of Mr. Cheſelden's patient, would have ſurpriſed me much more than it did, if I had not previouſly, in ſome ſimilar inſtances, had reaſon to ſuſpect that children, from whom cataracts had been extracted, had a notion of diſtance the firſt moment they were enabled to ſee. In the inſtance particularly of a young gentleman from Ireland, fourteen years old, from each of whoſe eyes I extracted a cataract, in the year 1794, in the preſence of Dr. Hamilton, phyſician to the London hoſpital, and who, before the operation, aſſured me, as did his friends, that he never had ſeen the figure of any object, Dr. Hamilton and myſelf were much aſtoniſhed by the facility with which, on the firſt experiment, he took hold of my hand at different diſtances, mentioning whether it was brought nearer to, or carried further from him, and conveying his hand to mine in a circular direction, that we might be the better ſatisfied of the accuracy with which he did it. In this caſe, however, and in others of a like nature, although the patients had certainly been blind from early infancy, I could not ſatisfy myſelf that they had not, before this period, enjoyed a ſufficient degree of ſight to impreſs the image of viſible objects on their minds, and to give them ideas which could not afterwards be entirely obliterated. In the inſtance of Maſter W. however, no ſuſpicion of this kind could occur; ſince, in addition to the declaration of himſelf and his mother, it was proved by the teſtimony of the ſurgeon who examined his eyes in the country, that the cataracts were fully formed before he was a year old. And I beg leave to add further, that on making inquiries of two children, between ſeven and eight years of age, now under my care, both of whom have been blind from birth, and on whom no operation has yet been performed, I find that the knowledge they have of colours, limited as it is, is ſufficient to enable them to tell whether coloured objects be brought nearer to, or carried further from them; for inſtance, whether they are at the diſtance of two inches or four inches from their eyes; nor have either of them the ſlighteſt ſuſpicion, as is related of Mr. Cheſelden's patient, that coloured objects, when held before them, touch their eyes.

But the judgment which Maſter W. formed of the different diſtances of objects, was not the only inſtance in which he differed from Mr. Cheſelden's patient; who, we are informed, "did not know the figure of any thing, nor any one thing from another, however different in ſhape and magnitude;" for Maſter W. knew and deſcribed a letter, not only as white, but alſo as ſquare, becauſe it had corners; and an oval ſilver box, not only as ſhining, but alſo as round, becauſe it had not corners: he likewiſe knew, and called by its name, a white ſtone mug, on the firſt day he obtained his ſight, diſtinguiſhing it from a baſon, becauſe it had a handle. Theſe experiments were made in the preſence of two reſpectable perſons, as well as myſelf; and they were ſeveral times repeated, to convince us that we could not be miſtaken in them. I mention the circumſtance, however, with much diffidence, being aware that the obſervations not only differ from thoſe that are related of Mr. Cheſelden's patient, but appear, on the firſt ſtatement, to oppoſe a principle in optics, which I believe is commonly and juſtly admitted, that the ſenſes of ſight and feeling have no other connection than that which is formed by experience; and, therefore, that the ideas derived from feeling can have no power to direct the judgment, with reſpect either to the diſtance or form of viſible objects. It ſhould be recollected, however, that perſons who have cataracts in their eyes, are not, in ſtrictneſs of ſpeech, blind, though they are deprived of all uſeful ſight. The inſtances I have adduced prove, that the knowledge they have of colours is ſufficient to give them ſome idea of diſtance, even in their darkeſt ſtate. When, therefore, their ſight is cleared by the removal of the opaque cryſtalline, which intercepted the light, and the colour of objects is thereby made to appear ſtronger, will it be difficult, or unphiloſophical, to conceive that their ideas of diſtance will be ſtrengthened, and ſo far extended as to give them a knowledge, even of the outline and figure of thoſe objects with the colour of which they were previouſly acquainted?"

The miſeries of blindneſs are feelingly deſcribed both by Homer and Milton, in the following impreſſive paſſages. The venerable father of epic poetry, who is ſaid, in the perſon of Demodocus the Phœacian bard, to have deſcribed his own ſituation, proceeds thus:

"Τὸν περὶ Μοῦσ' ἐφίλησε, δίδου δ' ἀγαθόν τε, κακόν τε,
Ὀφθα[illegible]"

Odyſſ. l. Θ. v. 63, 64.

"Dear to the muſe, who gave his days to flow
With mighty bleſſings mix'd with mighty woe,
In clouds and darkneſs quench'd his viſual ray,
Yet gave him pow'r to raiſe the lofty lay." Pope.

In ſimilar ſtrains does Milton bewail his calamity, in his addreſs to light:—

"Taught by the heav'nly muſe to venture down
The dark deſcent, and up to re-aſcend,
Though hard and rare; thee I reviſit ſafe,
And feel thy ſov'reign vital lamp: but thou
Reviſit'ſt not theſe eyes, that roll in vain
To find thy piercing ray, and find no dawn;
So thick a drop ſerene hath quench'd their orbs,
Or dim ſuffuſion veil'd. Yet not the more
Ceaſe I to wander, where the muſes haunt
Clear ſpring, or ſhady grove, or ſunny hill,
Smit with the love of ſacred ſong: but chief
Thee, Sion, and the flow'ry brooks beneath,
That waſh thy hallow'd feet, and warbling flow,
Nightly I viſit; nor ſometimes forget
Thoſe other two, equall'd with me in fate,
So were I equall'd with them in renown,
Blind Thamyris and blind Mæonides,
And Tireſias and Phineus prophets old:
Then feed on thoughts, that voluntary move
Harmonious numbers: as the wakeful bird
Sings darkling, and in ſhadieſt covert hid
Tunes her nocturnal note. Thus with the year
Seaſons return; but not to me returns
Day, or the ſweet approach of ev'n or morn,
Or ſight of vernal bloom, or ſummer's roſe,
Or flocks, or herds, or human face divine:
But cloud inſtead, and ever during dark,
Surrounds me, from the cheerful ways of men
Cut off, and for the book of knowledge fair
Preſented with an univerſal blank
Of nature's works to me expung'd and ras'd,
And wiſdom at one entrance quite ſhut out."

Paradiſe Loſt, b. iii.

Thus alſo does he deplore, in the moſt affecting accents, the misfortune of blindneſs in his "Sampſon Agoniſtes:"—

——"But chief of all,
O loſs of ſight, of thee I muſt complain!

Blind among enemies, O worse than chains,
Dungeon, or beggary, decrepid age.
Light, the prime work of God, to me is extinct,
And all her various objects of delight
Annull'd, which might in part my grief have eas'd,
Inferior to the vilest now become
Of man or worm. The vilest here excel me:
They creep, yet see; I dark in light expos'd
To daily fraud, contempt, abuse, and wrong,
Within doors, or without, still as a fool,
In power of others, never in my own;
Scarce half I seem to live, dead more than half.
O dark, dark, dark, amid the blaze of noon,
Irrecoverably dark, total eclipse
Without all hope of day!
O first created beam, and thou great word,
Let there be light, and light was over all;
Why am I thus bereav'd thy prime decree?
The sun to me is dark,
And silent, as the moon
When she deserts the night,
Hid in her vacant interlunar cave.
Since light so necessary is to life,
And almost life itself, if it be true
That light is in the soul,
She all in every part; why was the sight
To such a tender ball as th' eye confin'd?
So obvious, and so easy to be quench'd?
And not, as feeling, throughout all parts diffus'd,
That she might look at will through ev'ry pore?
Then had I not been thus exil'd from light,
As in the land of darkness, yet in light
To live a life half dead, a living death:
And buried; but yet more miserable!
Myself the sepulchre, a moving grave;
Bury'd, yet not exempt
By privilege of death and burial
From worst of other evils, pains, and wrongs,
But made hereby obnoxious more
To all the miseries of life."

The degree in which the calamity of blindness is felt and lamented by those to whom it occurs, may be also partly guessed at by the extasies into which persons have fallen on their recovery from it.

Mr. Boyle mentions a gentleman, who, having been blind, and brought to sight at eighteen, was very near going distracted with the joy. See a remarkable case of this kind, Tatler, N° 55. vol. i. Boyle's Works abr. tom. i. p. 4.

We find various recompences for blindness, or substitutes for the use of the eyes, in the wonderful sagacity of many blind persons recited by Zahnius in his "Oculus Artificialis," and others. In some, the defect has been supplied by a most excellent gift of remembering what they had seen; in others, by a delicate nose, or the sense of smelling; in others, by an exquisite touch, or a sense of feeling, which they have had in such perfection, that, as it has been said of some, they learned to hear with their eyes; as it may be said of these, that they taught themselves to see with their hands.

Some have been enabled to perform all sorts of curious and subtle works in the nicest and most dextrous manner. Aldrovandus speaks of a sculptor who became blind at twenty years of age, and yet ten years after made a perfect marble statute of Cosmo II. de Medicis: and another of clay like Urban VIII. Bartholin tells us of a blind sculptor in Denmark, who distinguished perfectly well, by mere touch, not only all kinds of wood, but all the colours; and F. Grimaldi gives an instance of the like kind; besides the blind organist living in Paris, who is said to have done the same.

The most extraordinary of all is a blind guide, who, according to the report of good writers, used to conduct the merchants through the sands and desarts of Arabia. James Bernouilli contrived a method of teaching blind persons to write. Leo Afr. Desc. Afr. lib. vi. p. 246. Casaub. Treat. of Enthus. chap. ii. p. 45. Fonten. Elog. des Acad. p. 114.

An instance no less extraordinary is mentioned by Dr. Bew in the "Transactions of the Manchester Society." It is that of a person, whose name is John Metcalf, a native of the neighbourhood of Manchester, who became blind at so early an age as to be altogether unconscious of light and its various effects. His employment in the younger period of his life was that of a waggoner, and occasionally as a guide in intricate roads during the night, or when the common tracks were covered with snow. Afterwards he became a projector and surveyor of high-ways in difficult and mountainous parts; and in this capacity, with the assistance merely of a long staff, he traverses the roads, ascends precipices, explores valleys, and investigates their several extents, forms, and situations, so as to answer his purpose in the best manner. His plans are designed, and his estimates formed, with such ability and accuracy, that he has been employed in altering most of the roads over the Peak in Derbyshire, particularly those in the vicinity of Buxton, and in constructing a new one between Wilmslow and Congleton, so as to form a communication between the great London road, without being obliged to pass over the mountain.

Although blind persons have occasion, in a variety of respects, to deplore their infelicity, their misery is in a considerable degree alleviated by advantages peculiar to themselves. They are capable of a more fixed and steady attention to the objects of their mental contemplation, than those who are distracted by the view of a variety of external scenes. Their want of sight naturally leads them to avail themselves of their other organs of corporeal sensation, and with this view to cultivate and improve them as much as possible. Accordingly they derive relief and assistance from the quickness of their hearing, the acuteness of their smell, and the sensibility of their touch, which persons who see are apt to disregard; and many instances have occurred, that seem to verify the opinion of Rochester;

"That if one sense should be suppress'd,
It but retires into the rest."

To this purpose we may observe, that Democritus is said to have put out his eyes, that he might think more intensely.

Many contrivances have also been devised by the ingenious for supplying the want of sight, and for facilitating those analytical or mechanical operations, which would otherwise perplex the most vigorous mind and the most retentive memory. By means of these they have become eminent proficients in various departments of science. Indeed, there are few sciences in which, with or without mechanical helps, the blind have not distinguished themselves. The case of professor Saunderson at Cambridge is well known. His attainments and performances in the languages, and also as a learner and teacher in the abstract mathematics, in philosophy, and in music, have been truly astonishing; and the account of them appears to be almost incredible, if it were not amply attested and confirmed by many other instances of a similar kind, both in ancient and modern times. Cicero mentions it as a fact scarcely credible, with respect to his master in philosophy, Diodotus, that "he exercised himself in

in it with greater assiduity after he became blind; and, which he thought next to impossible to be performed without sight, that he professed geometry, and described his diagrams so accurately to his scholars, as to enable them to draw every line in its proper direction." Jerom relates a more remarkable instance of Didymus in Alexandria, who, "though blind from his infancy, and therefore ignorant of the letters, appeared so great a miracle to the world, as not only to learn logic, but geometry also to perfection, which seems (he adds) the most of any thing to require the help of sight." Professor Saunderson, who was deprived of his sight by the small pox, when he was only twelve months old, seems to have acquired most of his ideas by the sense of feeling; and though he could not distinguish colours by that sense, which, after repeated trials, he said was pretending to impossibilities, yet he was able with the greatest exactness to discriminate the minutest difference of rough and smooth in a surface, or the least defect of polish. In a set of Roman medals he could distinguish the genuine from the false, though they had been counterfeited in such a manner, as to deceive a connoisseur, who judged of them by the eye. His sense of feeling was so acute, that he could perceive the least variation in the state of the air; and it is said, that in a garden where observations were made on the sun, he took notice of every cloud that interrupted the observation, almost as justly as those who could see it. He could tell when any thing was held near his face, or when he passed by a tree at no great distance, provided the air was calm, and there was little or no wind: this he did by the different pulse of air upon his face. He possessed a sensibility of hearing to such a degree, that he could distinguish even the fifth part of a note; and by the quickness of this sense he not only discriminated persons with whom he had once conversed so long as to fix in his memory the sound of their voice, but he could judge of the size of a room into which he was introduced, and of his distance from the wall; and if he had ever walked over a pavement in courts, piazzas, &c. which reflected a sound, and was afterwards conducted thither again, he could exactly tell in what part of the walk he was placed, merely by the note which it sounded. See SAUNDERSON.

Sculpture and painting are arts which, one would imagine, are of very difficult and almost impracticable attainment to blind persons; and yet instances occur, which shew that they are not excluded from the pleasing creative and extensive regions of fancy. We have known cases in which the form and features of the face have been delineated wholly by the touch, and in which it has been moulded with the utmost exactness. De Piles (Cours de Peint. p. 329.) mentions a blind sculptor, who thus took the likeness of the duke de Bracciano in a dark cellar, and made a marble statue of king Charles I. with great justness and elegance. However unaccountable it may appear to the abstract philosophers, yet nothing is more certain in fact, than that a blind man may, by the inspiration of the muses, or rather by the efforts of a cultivated genius, exhibit in poetry the most natural images and animated descriptions even of visible objects, without deservedly incurring the charge of plagiarism. We need not recur to Homer and Milton for attestations to this fact; they had probably been long acquainted with the visible world before they had lost their sight; and their descriptions might be animated with all the rapture and enthusiasm which originally fired their bosoms, when the grand and delightful objects delineated by them were immediately beheld. We are furnished with instances in which a similar energy and transport of description, at least in a very considerable degree, have been exhibited by those on whose minds visible objects were never impressed, or have been entirely obliterated. Dr. Blacklock affords a surprising instance of this kind; who, though he had lost his sight before he was six months old, not only made himself master of various languages, Greek, Latin, Italian, and French, but acquired the reputation of an excellent poet, whose performances abound with appropriate images and animated descriptions. See BLACKLOCK.

Another instance, which deserves being recorded, is that of Dr. Henry Moyes in our own country, who, though blind from his infancy, by the ardour and assiduity of his application, and by the energy of native genius, not only made incredible advances in mechanical operations, in music, and in the languages, but acquired an extensive acquaintance with geometry, optics, algebra, astronomy, chemistry, and all other branches of natural philosophy. From the account of Dr. Moyes, who occasionally read lectures on philosophical chemistry at Manchester, delivered to the Manchester society by Dr. Bew, it appears, that mechanical exercises were the favorite employment of his infant years; and that at a very early age he was so well acquainted with the use of edge-tools, as to be able to construct little windmills, and even a loom. By the sound, and the different voices of the persons that were present, he was directed in his judgment of the dimensions of the room in which they were assembled; and in this respect he determined with such a degree of accuracy, as seldom to be mistaken. His memory was singularly retentive; so that he was capable of recognizing a person on his first speaking, though he had not been in company with him for two years. He determined with surprising exactness the stature of those with whom he conversed, by the direction of their voices; and he made tolerable conjectures concerning their dispositions, by the manner in which they conducted their conversation. His eyes, though he never recollected his having seen, were not totally insensible to intense light; but the rays refracted through a prism, when sufficiently vivid, produced distinguishable effects upon them. The red produced a disagreeable sensation, which he compared to the touch of a saw. As the colours declined in violence, the harshness lessened, until the green afforded a sensation that was highly pleasing to him, and which he described as conveying an idea similar to that which he gained by running his hand over smooth polished surfaces. Such surfaces, meandering streams, and gentle declivities, were the figures by which he expressed his ideas of beauty; rugged rocks, irregular points, and boisterous elements furnished him with expressions for terror and disgust. He excelled in the charms of conversation; was happy in his allusions to visual objects; and discoursed on the nature, composition, and beauty of colours, with pertinence and precision. This instance, and some others which have occurred, seem to furnish a presumption, that the feeling or touch of blind persons may be so improved, as to enable them to perceive that texture and disposition of coloured surfaces by which some rays of light are reflected and others absorbed, and in this manner to distinguish colours. But the fact is still undecided; and farther trials are necessary, in order to set aside high authorities to the contrary, and absolutely to decide it. Dr. Reid, in his "Inquiry into the Human Mind on the Principles of Common Sense" (ch. vi. § 2.), deduces evidence from acknowledged facts, as well as reasoning, in order to shew, that there is very little of the knowledge acquired by sight, that may not be communicated to a man born blind. One who never saw the light may be learned and knowing in every science, even in optics; and may make discoveries in every branch of philosophy. He may understand as much as

another man, not only of the order, diſtances, and motions of the heavenly bodies, but of the nature of light, and of the laws of the reflection and refraction of its rays. He may underſtand diſtinctly, how thoſe laws produce the phenomena of the rainbow, the priſm, the camera obſcura, and the magic lanthorn, and all the powers of the microſcope and teleſcope. Nevertheleſs, as to the appearances of colour, a blind man muſt be more at a loſs, becauſe he has no perception that reſembles it; though, by a kind of analogy, he may ſupply even this defect. To thoſe who ſee, a ſcarlet colour ſignifies an unknown quality in bodies, that exhibits to the eye an appearance which they have often obſerved, and which they well know; but to a blind man, it denotes an unknown quality that exhibits an appearance, with which he is unacquainted. But he can conceive the eye to be variouſly affected by different colours, as the noſe is by different ſmells, or the ear by different ſounds: thus, he can conceive ſcarlet to differ from blue, as the ſound of a trumpet does from that of a drum; or, as the ſmell of an orange differs from that of an apple. It is impoſſible to know whether ſcarlet colour has the ſame appearance to me which it has to another man; and if its appearances to different perſons differed as much as colour does from ſound, they might never be able to diſcover this difference. Hence it is plain, that a blind man might talk for a long time about colours diſtinctly and pertinently; and if you were to examine him in the dark about the nature, compoſition, and beauty of them, he might be able to anſwer, ſo as not to betray his defect. After all, as a blind man has never had any ſenſation of light and colour, his knowledge concerning them, however extenſive and accurate, muſt be the reſult of previous inſtruction; it muſt depend on the force of genius, or on the ſtrength of memory; and his language concerning coloured objects muſt be like that of a parrot, without any preciſion of meaning, and without any correſponding ideas. On this diſputed ſubject the reader may derive information from Diderot's "Lettre ſur les Aveugles a l'uſage de ceux qui voyent," or "A letter concerning the Blind for the uſe of thoſe who ſee," in his "Works," vol. ii.; and they alſo may conſult Cheſelden's "Anatomy," and Locke's "Eſſay on the human underſtanding."

With regard to the ſcientific and practical departments of muſic, every age has ſupplied numerous inſtances of blind perſons who have attained to great excellence. They will occur among the articles of muſical biography in the courſe of this work.

Of the contrivances that have been deviſed for the aſſiſtance of the blind, we have already mentioned thoſe of profeſſor Saunderſon, and of Mr. Grenville, under the article *Palpable* Arithmetic. We ſhall here ſubjoin, from a letter addreſſed by Dr. Moyes to the editor of the "Encyclopædia Britannica," an account of the palpable notation generally uſed by him for twenty years, for the purpoſe of aſſiſting his memory in numerical computations. With this view he made uſe of a ſquare piece of mahogany, a foot broad and an inch thick, repreſented by ABCD (*Plate I. Algebra, fig.* 3.); he divided each of the ſides AB, BC, CD, DA, into 24 equal parts; joined each pair of oppoſite diviſions by a groove cut in the board of ſufficient depth to be felt with the finger; and perforated the board at each interſection with an inſtrument $\frac{1}{10}$th of an inch in diameter. Having thus divided the ſurface of the board into 576 ſmall ſquares, perforated at each of their angles, he fitted to the holes in the board three ſets of pegs or pins, reſembling thoſe in the plate, *figs.* 4, 5, 6, in ſuch a manner, that when fixed in them they kept their poſition, and required ſome force to turn them round. The head of each peg belonging to the firſt ſet is a right-angled triangle, about $\frac{1}{10}$th of an inch thick; the head of each peg belonging to the ſecond ſet differs from the former merely in having a ſmall notch in its ſloping ſide or hypothenuſe; and the head of each peg of the third ſet is a ſquare, the breadth of which ſhould be equal to the baſe of the triangle of the other two. Theſe pegs ſhould be kept in a caſe conſiſting of three boxes or cells, each cell being allotted to a ſet; and the caſe muſt be placed cloſe by the board before the commencement of every operation. Each ſet ſhould conſiſt of 60 or 70 pegs, at leaſt when employed in long calculations; and when the work is finiſhed, they ſhould be collected from the board, and carefully reſtored to their reſpective boxes. When a peg of the firſt ſet is fixed into the board, it will acquire four different values, according to its poſition with reſpect to the calculator. When its ſloping ſide is turned towards the left, it denotes *unit*, or the firſt digit; when turned upwards, or from the calculator, it denotes 2, or the ſecond digit; when turned to the right, it repreſents 3; and when turned downwards, or towards the calculator, it denotes 4. The number 5 is denoted by a peg of the ſecond ſet, having its ſloping ſide turned to the left; 6, by the ſame turned upwards; 7, by the ſame turned to the right; and 8, by the ſame turned directly down, or towards the body of the calculator. The figure 9 is expreſſed by a peg of the third ſort, when its edges are directed to right and left; and the ſame peg expreſſes the cypher 0, when its edges are directed up and down. By theſe different pegs the relative values of the ten digits may therefore be diſtinctly expreſſed with facility; and by a ſufficient number of each ſet the ſteps and reſult of the longeſt calculation may be clearly repreſented to the ſenſe of feeling. For an example, let it be required to expreſs the year of the Chriſtian æra 1788. Take a peg of the firſt ſet, and fix it in the board, with its ſloping ſide turned towards the left, which repreſents 1; take a peg of the ſecond ſet, and fix it in the next hole in the ſame groove, proceeding as uſual from left to right, with its ſloping ſide turned to the right, and this expreſſes 7; take again a peg of the ſame ſet, and fix it in the next hole with its ſloping ſide turned downwards, and this will repreſent 8; and laſtly, take another peg of the ſame ſet, and place it in the next hole in the ſame poſition which will denote 8; and thus the whole will expreſs the number required. In order to expreſs a vulgar fraction, the numerator is placed in the groove immediately above, and the denominator in that immediately below the groove in which the integers ſtand; and in decimal arithmetic an empty hole in the integer groove repreſents the comma, or decimal point. By ſimilar breaks are alſo denoted pounds, ſhillings, pence, &c.; and by the ſame expedient, the diviſor and quotient in diviſion are ſeparated from the dividend. "This notation," ſays the ingenious inventor, "which ſupplies me completely with co efficients and indices in algebra and fluxions, ſeems much ſuperior to any of the kind hitherto made public in the weſt of Europe. That invented and deſcribed by Mr. Grenville, having no leſs than ten ſets of pegs, is by much too complicated for general practice; and that which we owe to the celebrated Saunderſon is apt to puzzle and embarraſs the calculator, as the pegs repreſenting the numerical digits can ſeldom or never be in the ſame ſtraight line."

It redounds very much to the honour of modern times, that the public attention has been directed to the improvement of the condition of blind perſons; and that inſtitutions have been formed in different countries for providing them with ſuitable employment, tending not only to alleviate their calamity, but to render them uſeful. The firſt regular and

ſyſtematic plan for this purpoſe was propoſed by M. Haüy in an "Eſſay on the education of the Blind," printed at Paris in the year 1786, under the patronage of the Academy of Sciences. An Engliſh tranſlation of this eſſay is annexed to "Dr. Blacklock's Poems," printed at Edinburgh in 1793, 4to. The object of this plan is to teach the blind reading, by the aſſiſtance of books, in which the letters are rendered palpable by their elevation above the ſurface of the paper; and by theſe means to inſtruct them, not only in the liberal arts and ſciences, but likewiſe in the principles of mechanical operations, ſuch as ſpinning, knitting, book-binding, &c. ſo that thoſe who are in eaſy circumſtances may be capable of amuſing employment, and thoſe of the lower ranks of life, and ſuch as have no genius for literary improvement, may nevertheleſs, become reſpectable, uſeful, and independent members of ſociety, in the ſituation of common artiſans. By theſe palpable characters, they are taught to read, to write, and to print; and they are likewiſe inſtructed, according to their ſeveral talents and ſtations, in geometry, algebra, geography, and every branch of natural philoſophy. The inſtitution encourages and cheriſhes a taſte for the fine arts; it teaches the blind to read muſic with their fingers, as others do with their eyes; and it does this with ſo much ſucceſs, that though they cannot at once feel the notes and perform them upon an inſtrument, yet they are capable of acquiring any leſſon with as much exactneſs and rapidity, as thoſe who enjoy all the advantages of ſight. Of this curious and intereſting eſſay, now before us, we ſhall give ſuch an account as may ſerve to gratify thoſe of our readers, who are concerned in the ſupport of plans, ſomewhat reſembling that which it deſcribes, in our own country. The author, after ſtating the object of his plan, and obviating the ſcruples of thoſe who demur againſt allowing its general utility, in the two firſt chapters, proceeds, in the third chapter, to illuſtrate the method of reading, as adapted to the practice of the blind. This method conſiſts, as we have already obſerved, in the uſe of typographical characters, whoſe elevation above the ſurface of the paper renders them obvious to the touch, without the intervention of ſight. From the perception of typographical characters, the tranſition is not difficult to that of written characters; i. e. of characters not written with ink, but formed by impreſſions made upon ſtrong paper with an iron pen, whoſe point is not ſlit. The characters, thus produced, are diſtinctly ſeparated and inverted; and they are marked on the ſide of the paper contrary to that which is read, and in ſuch a manner that the poſition and order of the letters may appear right and in relievo when the page is turned. The blind may thus be able to form and decypher muſical characters, mathematical diagrams, and all the neceſſary proceſſes of arithmetic and geography, as well as thoſe that are printed and written. In the fourth chapter the author replies to ſeveral objections that are urged againſt the method of reading he has propoſed. The fifth and ſixth chapters contain an account of the art of printing, as it is practiſed by the blind, for their peculiar uſe, and alſo as it is performed for the uſe of thoſe who ſee. In the proceſs of printing, the blind compoſitor has a box for every alphabetical character in uſe; on the outſide of theſe boxes are palpably marked the peculiar character belonging to each; theſe are filled with types, which he ſelects and ſets as they are wanted, but in a contrary poſition to that in which they are read. When the types have been arranged and fixed, a page of very ſtrong paper is moiſtened, ſo as to be capable of receiving and retaining impreſſions, and laid upon the types; and then by the operation of the preſs, or by the eaſy ſtrokes of a ſmall hammer frequently repeated over the ſurface, the impreſſion of the type is made to riſe on the oppoſite ſide of the paper; and it continues, when dry, not only obvious to the ſight but to the touch, and is not eaſily effaced. One the upper ſide of the paper the letters appear in their proper poſition; and by their ſenſible elevation above the common ſurface, the blind may eaſily read them with their fingers. The ſeventh chapter explains the method of teaching the blind to write; which we have already noticed. The eighth chapter ſhews how they are taught arithmetic; for this purpoſe they are provided with a board pierced with different lines of ſquare holes, proper for receiving moveable figures, and bars for ſeparating the different parts of an operation. To render this board more uſeful, a caſe is added, compoſed of four rows of little boxes, which contain all the figures proper for calculation, and which are placed at the right hand of the blind perſon while he operates. In order to obtain characters for expreſſing all the poſſible fractions, 10 ſimple denominators are caſt, in the order of the figures 0, 1, 2, &c. to 9 inclusively, and likewiſe 10 ſimple numerators in the ſame order, moveable, ſo as to be adapted at the head of the denominators. By means of this combination, the blind are able to expreſs any fraction. The ninth chapter treats of geography, and in teaching it, M. Weiſſenbourg and Mad. Paradis marked the circumference of countries by a tenacious and viſcid matter, and covered the different parts of their maps with a kind of ſand mixed with glaſs, in various modes; and diſtinguiſhed the order of towns by grains of glaſs, of a greater or leſs ſize. M. Haüy ſatisfies himſelf with marking the limits of the maps, for the uſe of the blind, by ſmall iron wire rounded; and it is always a difference, either in the form or ſize of every part of a map, which aſſiſts his pupils in diſtinguiſhing the one from the other. For the purpoſe of teaching muſic, the ſubject of the tenth chapter, muſical characters are caſt; and theſe are ſo numerous, as to repreſent upon paper, by elevations on its ſurface, all the poſſible varieties that occur. The eleventh chapter contains an account of the mechanic arts, in which the blind are employed, and of the method in which they are formed for ſuch occupations. Accordingly they have been ſucceſsfully employed in ſpinning, in making pack-thread of the thread they have ſpun, in weaving girths with this pack-thread, in making nets, in ſewing, in binding books, &c. In the twelfth chapter we have a view of the proper mode of inſtructing the blind, together with a parallel between their education and that of the deaf and dumb. This operation, it is ſaid, is eaſy in itſelf, and requires in a maſter more courage than knowledge. "By the aid," ſays M. Haüy, "of our books in relievo, every one can teach them to read. Upon the muſical works found in our preſs, every profeſſor of that art may give them leſſons. With an iron pen, with plates and moveable characters, executed according to our models, the firſt maſter in writing may teach them that art, and arithmetic." The thirteenth chapter contains a brief account of the elementary books of languages, mathematics, and hiſtory, which ſhould compoſe the library of the blind perſon. The eſſay terminates with an hiſtorical ſummary of the riſe, progreſs, and actual ſtate of the inſtitution for blind children. The ſucceſs of this inſtitution has fully anſwered the expectations of its founder, and amply compenſated the expence beſtowed upon it by the liberal and well diſpoſed. We are happy to add, that inſtitutions of a ſimilar kind have been eſtabliſhed in our own country; and to render our particular tribute of reſpect to the founders and ſupporters of the "School for the Indigent Blind," inſtituted in London in 1799. It is now ſituated in St. George's-fields, but will ſpeedily be removed to Gray's Inn-lane, as ſoon as the neceſſary buildings for its accommodation are erected. The object, with a view to which this ſchool was founded, is unqueſtionably one of the moſt important and intereſting kind

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that can excite compaſſion, or demand encouragement. It provides inſtruction for the indigent blind, in a trade, by which they may be able to provide, either wholly or in part, for their own ſubſiſtence; and thus, inſtead of being altogether a burden to the community, they will be of ſome ſervice to it; and inſtead of being depreſſed and cheerleſs themſelves, under a ſenſe of their total dependence, and for want of regular employment, habits of induſtry will relieve their ſpirits, and produce the moſt beneficial effects on their ſtate and character. The children of this inſtitution, amounting in the preſent year (1804) to 32, are completely clothed, boarded, lodged, and inſtructed, gratis. The articles at preſent manufactured in the ſchool are ſhoemakers'-thread, fine and coarſe thread, window ſaſh-line, and cloaths'-line (of a peculiar conſtruction, and made on a machine adapted to the uſe of blind perſons), by the females; and window and ſaſh-line, cloaths'-line, hampers, and wicker baſkets, by the males. The ſucceſs that has crowned the efforts of the friends of this inſtitution, ſince its firſt eſtabliſhment, affords ſufficient evidence of the degree in which the ſituation and faculties of the blind are capable of improvement; and a view of it in its preſent proſperous ſtate, muſt be gratifying to perſons of humane and compaſſionate feelings. Here they will not find the ſcholars ſitting in liſtleſs indolence, which is commonly the caſe with the blind, or brooding in ſilence over their own defects, and their inferiority to the reſt of mankind; but they will behold a number of individuals, of a claſs hitherto conſidered as doomed to a life of ſorrow and diſcontent, and to be provided for merely in alms-houſes, or by donations of charity, not leſs animated in their amuſements, during the hours of recreation, and far more cheerfully attentive to their work in thoſe of employment, than perſons poſſeſſed of ſight. This important and uſeful inſtitution is under the direction of a preſident, eight vice-preſidents, a treaſurer, and a committee of 24 members. A ſubſcription of one guinea annually, or of not leſs than 20 guineas at once, or within one year, conſtitutes a member.

To this article we ſhall ſubjoin the following directions given by Mr. Thickneſſe, for teaching the blind to write:

"Let any common joiner make a flat board, about 14 inches long, and 12 wide; in the middle of which let a place be ſunk, deep enough, when lined with cloth, to hold only two or three ſheets of fool's-cap paper, which muſt quite fill up the ſpace: over this muſt be fixed a very thin falſe frame, which is to cover all but the paper, and faſtened on by four little pins, fixed in the lower board: and acroſs the lower frame, juſt over the paper, muſt be a little ſlider, an inch and a half broad, to ſlip down into ſeveral receſſes made in the upper frame, at a proper diſtance for the lines, which ſhould be near an inch aſunder; and this ruler, on which the writer is to reſt his fourth and little finger, muſt be made full of little notches, at a quarter of an inch diſtant from each other; and theſe notches will inform the writer, by his little finger dropping from notch to notch, how to avoid running one letter into another. When he comes to the end of the line, he muſt move his ſlider down to the next groove, which may eaſily be ſo contrived with a ſpring to give warning that it is properly removed to the ſecond line, and ſo on."

Blindness, in the *Veterinary Art*, a diſeaſe very frequently happening to horſes. The eye of the horſe is ſubject to various diſeaſes which may occaſion blindneſs, as the *cataract*, the *gutta ſerena*, opacity of the cornea or its coverings, &c.

The diſorder, however, generally inducing blindneſs among horſes is the *cataract*, and the inflamation of the external parts of the globe of the eye, which precedes the obſcuration of the cryſtalline, is termed blindneſs, as though the diſeaſe was really confirmed; and horſes ſo affected are conſidered as ſuch, and denominated blind, though at this period of the diſeaſe the ſight is only rendered imperfect.

This deſtructive diſorder, in general commences with an inflammation of the outer coats of the eye, as the *membrana conjunctiva*, or *cornea*, or both together, and extending gradually to the interior, inflames and deſtroys the tranſparency of the cryſtalline, and obſtructs the admiſſion of light.

Theſe attacks of inflammation not unfrequently diſappear for a time, or, at leaſt, become much leſs diſtinguiſhable, and then return again, obſerving ſomething like regular periods of acceſſion and remiſſion; and from hence the diſeaſe has been termed by ſome the *moon blindneſs*, and theſe changes were conſidered as under the influence of this planet, and correſponding with the periods of its change: there are, however, other cauſes more powerful in their influence, to which theſe changes in this diſorder may, with more appearance of truth, be attributed, as improper expoſure to exceſſive cold, or drafts of air; to a cloſe, low, over-heated ſtable, or ſudden alternations from the one to the other; violent exerciſe and ſweating; then waſhing with cold water, leaving the hair drenched with it; acrid volatile ſalts riſing from the dung; overfeeding with too hot, dry, and ſtimulating food, and all cauſes inducing an increaſed action of the heart and arteries, naturally tend to induce a recurrence of this complaint.

As this diſeaſe is one of the moſt intereſting in the veterinary art, and the moſt neceſſary to be well underſtood, as well by profeſſional men, as by dealers and poſſeſſors of horſes, we ſhall deſcribe at ſome length the appearances by which it is known to exiſt, and the means that have hitherto been employed, as far as they have come to our knowledge, for the removal of it. Thoſe who may deſire to be acquainted reſpecting the information poſſeſſed by the ancients of this complaint, and their practices for its cure, may be referred to the writings of Abſyrtus and Vegetius: the latter, in his elegant work *de arte Veterinaria*, lib. 2. cap. xvi. *de ſuffuſione oculorum*, has divided this diſorder into three kinds, under the titles *ſtenochoriaſis*, *protochoriaſis*, *hypochoriaſis*; by his definitions, however, of theſe three kinds, it appears that he only meant the different ſtages of the formation of the cataract, from the firſt inflammation of the eye, to the cryſtalline becoming perfectly opaque and burſting its capſule; ruſhing to the anterior chamber of the eye, and reſting, like a white opaque ball, againſt the cornea; occaſioning a total loſs of ſight, and which he compares to the yolk of an egg burſting from its ſituation in the centre of the egg, and to which it can never be again reduced. He conſiders the cauſe of this complaint to be the rupture of the membrane containing the ſight; by exceſſive heat, or more certainly from the fatigue of a long journey, or the neglected injury of the eye, from the inattention of the maſter. His *hypochoriaſis*, which appears to be the firſt ſtage of this diſorder, he ſays, deſcends from the head; and often ſhews itſelf in one eye, and then migrates to the other, and is attended with a flow of water or tears. His treatment, in this caſe, is to bleed often from the eye-brow, or rather the eye-lids, and from the temples; to foment frequently with warm water in which rue and fennel ſeeds have been boiled; to anoint the eye "*cum collyrio opopanacto et opobalſamato.*" He alſo recommends applying the actual cautery to the temples above the veins. This author, in another chapter, recommends, in this complaint, that you ſhould inſpect the noſtril on the ſame ſide with the morbid eye, and you will

find a ſmall opening, through which, by inſerting a pipe, you may fill the eye with wine, and relieve the diſorder; a remarkable proof of the minute and accurate obſervation of the ancients. The exiſtence of ſuch an opening (for it is, in reality the opening of the lacrymal duct that is alluded to), is not known to many who profeſs to practiſe on the diſeaſes of horſes at this day.

Abſyrtus, a Greek writer, who lived about the reign of Conſtantine the Great, and prior to Vegetius, recommends, in this diſorder, and which he calls κολωμα, that the ear ſhould be pierced with an awl, and a piece of white hellebore ſhould be inſerted in the perforation for its relief.

The following we venture to give as a more natural and true deſcription of the appearances of the eye, during the preſence of this complaint, than what has before been exhibited; though, no doubt, ſubject to many omiſſions and imperfections, which future obſervations may lead us to rectify.

The earlieſt indication of this diſeaſe is exhibited by the external tranſparent parts of the ball of the eye becoming obſcured, aſſuming a blackiſh glaſſy hue; ſometimes blue or brown, or a dull white, and ſtreaked with blood, according to the degree of inflammation or diſtenſion of the blood-veſſels; admitting, according to their capacity, the different parts of the blood which are not tranſparent; and this inflammation, it may be remarked, takes place more frequently in young horſes of five or ſix years old, than in thoſe of a more advanced age, and the upper half of the *cornea* generally appears more obſcured than the lower; this, however, may be a deception, ariſing merely from the point of viſion, the obſerver being placed below the eye, and ſeeing directly through the lower part, and more obliquely through the upper. The blood-veſſels alſo may be obſerved increaſed in number and ſize, paſſing over the opaque white ſurface of the ſclerotica, to the *cornea* and *conjunctiva;* for it has not, as far as we know, been ever aſcertained from actual diſſection or experiment, whether it is the cornea that is inflamed, or the conjunctiva, or both; nor is it abſolutely neceſſary for the treatment, that this ſhould be known.

The eye and eye-lids feel hotter to the hand than uſual; and often times there is a depoſit of a white matter reſembling pus, in the bottom of the anterior chamber of the eye, which, perhaps, proceeds from the veſſels of the ciliary fringe, or uvea, which are large in the horſe.

After this opacity of the cornea has exiſted ſome time, the eye of itſelf, or ſtill more certainly, if antiphlogiſtic means are uſed, returns to its natural brilliancy, and the diſorder ſeems removed; a few weeks or months may elapſe before its return; and if theſe remedies are had recourſe to very early, the diſorder may even be permanently removed; it very frequently, however, returns, and again diſappears, and this ſeveral times before the inflammation of the cryſtalline, and the deſtruction of ſight take place. In other ſubjects, one uninterrupted courſe of inflammation, without any interval takes place, till the cataract is fully formed.

When this morbid proceſs begins in the cryſtalline, the inflammation of the exterior parts of the eye often diſappears, and they aſſume their uſual brightneſs, and afford us an opportunity of diſtinctly obſerving the changes which take place in the lens.

And with reſpect to the cataract itſelf, or this opacity of the lens, we may remark that the whole cryſtalline ſhall aſſume this milky appearance at once, or a ſmall ſpeck only near the centre ſhall be ſeen, which often remains for years, without the leaſt perceivable increaſe, and without producing blindneſs, or any ſenſible detriment to the animal: again, in other caſes, no ſpeck is obſervable but whitiſh lines which reflect the light, ſtretching like rays from the centre of the lens to its circumference; and ſometimes the capſule containing it is ſaid to be only affected.

The cataract, as it is called, being fully formed, the complete opacity of the lens being eſtabliſhed, and light no longer admitted, the iris begins to loſe its properties, nearly cloſing up the opening of the pupil; from its relaxation, the whole eye becomes diminiſhed, and apparently ſunk in the head; and the capſule, eſpecially in draft horſes, burſts, and the lens is forced from its ſituation, and falls to the anterior chamber of the eye, reſembling, as we have before obſerved, an opaque white ball.

As perfect clearneſs and diſtinctneſs in all parts of the eye, with a due contraction of the pupils, are the moſt certain indications of its goodneſs, ſo the ſlighteſt dulneſs or opacity in the external coats, or diminution of the pupil, ſhould lead the purchaſer to be cautious; for it cannot be too often obſerved, that this opacity, after it has been of ſome ſtanding, is almoſt certain deſtruction to the eye; and there are no remedies at this time known that can prevent its fatal termination, though numerous attempts and experiments have been inſtituted with this view; and the operation for the cataract is uſeleſs in the horſe; for if it ſucceeds, the viſion is ſtill ſo imperfect, that blindneſs itſelf is preferable.

Though various uſeful offices can be found for horſes that have loſt their ſight; yet it is of importance, for moſt of the purpoſes to which they are applied, that it ſhould be preſerved. We cannot recommend with too much force, the neceſſity of an early recurrence to the preſcribed remedies for deſtroying the inflammation; for, at its very commencement, it has probably only the characters of common inflammation, and might be entirely and effectually ſubdued as in other parts; but neglected, this diſorder ſoon aſſumes its peculiar properties, ariſing, perhaps, from the particular ſtructure and functions of the parts affected, and in a ſhort time becomes perfectly beyond the reach of any remedy; for though, no doubt, there are a few inſulated inſtances where this diſorder has been removed, yet, as the termination of the generality of caſes is of an oppoſite nature, it would be unwarrantable to make a concluſion from ſuch caſes of the general poſſibility of cure in this complaint.

Where the inflammation has not yet received the ſpecific properties above deſcribed, the following remedies will frequently remove it; and in more confirmed caſes, we ſhall mention the means that have been unſucceſsfully employed to remove it. that we may ſhew the inſufficiency of ſuch attempts, and promote farther experiment and reſearch reſpecting it.

In the commencement of this complaint, the uſe of abſtinence from heating food, or hard exercise; expoſure to ſtables of cooler temperature, and well aired, not from partial drafts, but their loftineſs only; excluſion of too much light, or the light altogether; diluent drinks, and purgatives; ſuch may be employed to the general ſyſtem. To the part itſelf, waſhes of cold water, or ice and water, or litharge water, or with a ſmall portion of opium diſſolved in it; others think more favourably of ſtimulating, or cauſtic waſhes, as weak ſolutions of vitriolated zinc, very dilute acids, and even ſpirits and water.

Bliſters applied to the cheek, or over the maſſeter muſcle, produce an irritation which is very ſucceſsful in removing this inflammation, and, in particular, the inſertion of a ſeton or two in the muſcular parts ſurrounding the eye, care being taken that the faſcia over the muſcle is divided,

otherwiſe

otherwiſe there is no ſuppuration; theſe will tend, as we have experienced, powerfully to carry off an attack of this diſorder. Firing with a hot iron has alſo been employed with the ſame view, on the ſurrounding ſkin; and likewiſe blood-letting from the jugular vein, or from the temporal artery, or locally from the veſſels proceeding from the inner canthus, or anterior angle of the orbit; as alſo the veſſels paſſing over the ſclerotic coat, which become very much inlarged and viſible in this diſeaſe, as well as thoſe in the lining of the lids.

Mr. Coleman, the very ingenious profeſſor of the veterinary college, ſcared up the veſſels of the ſclerotica with a hot iron, forming an entire circle round the ball of the eye, at ſome diſtance from the cornea, to prevent all acceſs of blood to this part, and ſo endeavoured, mechanically, to put a ſtop to the inflammation; it was found, however, inſufficient to deſtroy the diſorder, and we believe that any hope of relief from this mode of treatment has ſince been abandoned; and for this reaſon, perhaps, this experiment has proved inſufficient, that when communication is ſtopped from the exterior veſſels, there are others whoſe trunks are ſhort of theſe, which ſupply the ſubſtance of the cornea; and others again, out of our reach, on the inſide of the cornea; but above all, the habit in the parts to diſeaſe, and the diſpoſition in the ſyſtem to generate it, are not overcome, and the morbid tendency is not thereby deſtroyed.

The farriers, who practiſe medicine, in treating this complaint, often remove the lacrymal gland, which they call the haw, from its ſuppoſed reſemblance to this fruit; and as this part partakes of the inflammation, and is much ſwelled, they miſtake it for the ſource of the diſorder. The removal of it, which is eaſily done, by drawing it out with a hook, and cutting it off, occaſions a copious diſcharge of blood, which, in ſlight attacks, relieves the eye, and encourages them in this practice; but from our own perſonal experience we have learned, that in caſes of any duration, it is totally inadequate to the removal of the complaint, and the eye muſt obviouſly ſuffer from the loſs of a part that is neceſſary to its well-being: and means leſs injurious to the eye may be equally well employed with as much ſucceſs, ſuch as we have before pointed out.

An infuſion of the *polygonum hydropiper* injected into the noſtril, ſo as ſlightly to inflame the membranes, produces very good effects in this complaint.

It has been obſerved, that in the human eye, long continued inflammations of the exterior coats rarely produce cataracts, as they do in the horſe; and the reaſon that has been aſſigned for this is, that the ſame blood-veſſels which ſupply the *tunica conjunctiva* and *cornea*, alſo ſupply the lens and the humours of the eye, which they ſay is not the caſe with the human, as theſe parts are ſupplied from the eyelids and integuments; there is, however, in the horſe, a ſingular propenſity to inflammatory complaints, and to this diſpoſition, perhaps, it is rather to be attributed.

In the inflammation of the cornea, which is attended with a black, gloſſy appearance of this part, there is ſeldom any increaſed diſcharge of tears from the eye and noſe; but in the other kinds which we have before enumerated, there is, in general, a conſiderable increaſe of this ſecretion. When blood-ſtreaks, or blotches appear, it is probable that the veſſels are ruptured, and that this blood is really in a ſtate of extravaſation.

BLINK *of the ice*, in *Sea Language*, denotes that bright, white appearance produced by the ice near the horizon, and perceptible, in approaching the ice, long before it is itſelf ſeen. This phenomenon has been often remarked by mariners, and is particularly mentioned in Phipps's (lord Mulgrave's) voyage to the North Pole, p. 70.

BLINKS, in *Botany*. See MONTIA.

BLINKS, among *Ancient Sportſmen*, denoted boughs broken down from trees, and thrown in the way where deer are likely to paſs, to hinder their running, or rather to mark which way a deer runs, in order to guide the hunter.

BLINKING *of beer*, in Lincolnſhire, ſignifies letting the wort ſtand for ſome time in the vat, till it hath acquired ſome degree of acidity, in order to diſpoſe it to fine, and be the ſooner ready for drinking.

BLISSOM, among *Huſbandmen*, corruptly called *bloſſom*, is the act of a ram, when coupling with an ewe.

BLISTER, in *Pharmacy*. Bliſters are raiſed on the ſurface of the body for medicinal purpoſes, by applying, for a number of hours, ſome of the moſt active of the animal or vegetable ſtimulants. Of theſe, by far the moſt convenient, and that which is almoſt univerſally employed, is the *cantharis*, or *Spaniſh fly*, (MELOE *Veſicatorius*.) Theſe inſects are found in Spain, Italy, and the ſouth of Europe; they have a longiſh body, beautifully brilliant with green and gold. They are gathered, by ſhaking the trees which they frequent, and are killed by the vapour of ſpirit of wine burnt beneath them, or by the fumes of vinegar, after which they are dried in a ſtove. In this ſtate they are brought over without further preparation.

Cantharides poſſeſs ſo much acrimony, that in reducing them to powder, the face ſhould be covered with a maſk, to prevent the troubleſome ſneezing and excoriation of the fauces, from the finer duſt flying about. Taken internally, in an overdoſe, they inflame the whole inteſtinal canal, in a greater or leſs degree; and they have a peculiar tendency to irritate the urinary organs. Applied to the ſkin, they firſt inflame the part, but often, with ſcarcely any attending pain; after which they produce a very copious bliſter of clear, yellowiſh ſerum beneath the cuticle, which riſes in a large bag. This inſect appears to poſſeſs this veſicating property in a much larger degree, in proportion to the pain excited, than any other ſtimulant; and hence its peculiar utility in producing this ſerous diſcharge with the leaſt poſſible inconvenience to the patient. It is not exactly known in what part of the inſect the veſicating property reſides, or whether it does not equally belong to every part. It is not eaſily deſtroyed, or impaired by long keeping, if the inſect be unbruiſed, and preſerved in a dry place.

For bliſtering the ſkin, the cantharides are firſt finely powdered, and then incorporated, with ſome labour, with a ſimple mixture of wax and reſin melted together, to which ſome add a little vinegar, and allowed to grow nearly cold before the flies are added. This is a neceſſary precaution, ſince it is certainly known that a conſiderable heat impairs the bliſtering property. The plaſter, thus made, ſhould be of ſuch a conſiſtence, as readily to ſoften with a moderate heat. When uſed, it is generally ſpread uniformly upon leather, of the requiſite ſize and ſhape, by the aſſiſtance of an iron ſpatula, warmed ſcarcely more than the hand can bear.

To increaſe the effect, ſome apothecaries ſprinkle the plaſter with powdered cantharides, after it is ſpread on the leather, but this is not neceſſary, where the plaſter itſelf is good; and the powder is apt, after veſication, to lodge on the tender cutis, and produce much needleſs irritation. As the bliſtering plaſter adheres very looſely to the ſkin, it is uſeful in applying it to children, to maniacal perſons, and wherever it is in danger of being too ſoon pulled off, to ſurround the bliſter with a margin of ſtrong adheſive plaſter.

The

The plaster of cantharides seldom fails to produce a large blister, in ten or twelve hours; but its operation continues sometimes longer, so that it may be conveniently suffered to remain for twenty-four hours, the large cuticular bags being punctured to let out the fluid. When the plaster is taken off, and the serum mostly discharged, the blistered part should be dressed with spermaceti, or some other mild ointment, unless it be intended to keep up the serous discharge by stimulating applications.

The pain produced by the action of cantharides varies greatly, according to the part affected, the thickness of the skin, and the general irritability of the constitution, and in particular of the surface of the body. Most frequently the pain is very slight, often amounting to no more than a sense of heat on the part. When very acute, it is of great service to remove the plaster, when it has been on about two hours, to anoint the part with oil or cream; and about an hour or two after, to replace the blistering plaster, which will then often proceed to vesicate without much further irritation.

The operation of cantharides is much affected by the thickness of the skin beneath; and hence the scalp resists vesication more than the softer skin of the abdomen; and particularly by the heat of the body, so that the plaster should be stronger, and its consistence softer, when applied to an unusually cold surface.

Sometimes, though rarely, the symptoms of strangury produced by this active medicine, follow even its external application.

A more active vesicatory is supposed to be made by adding other stimulating substances to the cantharides plaster. In the Paris Pharmacopœia, euphorbium (the most acrid of all the medicinal gums) is added in equal quantity with the cantharides: in the Edinburgh, verdegris, mustard, and black pepper are used.

It is often of advantage to keep up a discharge from a blistered part for a considerable time. It then becomes gradually purulent. For this purpose, a milder form of cantharides is highly useful, and a softer consistence is given to it. This may be done by mixing a small portion of the flies in powder, with any simple ointment; but this is liable to act unequally, and the entire particles of the fly sometimes create trouble, by lodging upon the tender cutis. To remedy this, the London college use a watery infusion of cantharides, mixed with a stimulating resin ointment, melted, and continued over a slow fire, till all the water is evaporated, leaving a small portion of extractive matter of the flies, equally diffused through the ointment, and strongly increasing its stimulating power.

A few other substances have been occasionally used to produce vesication. One of these is the inner bark of the *Mezereon*, (DAPHNE *Mezereum*) and of another plant of the same genus, the *Thimelæa Laureola*, or *Spurge Laurel*, (DAPHNE *Laureola*) both shrubby plants, well known in gardens. The use of the latter (which will equally apply to the mezereon) is thus directed in the Paris Pharmacopœia. Small twigs of the plant, about the size of a pen, and smooth, are selected, and cut transversely into portions of the requisite length. These are steeped in milk-warm water, or in vinegar, for about half an hour, to loosen the bark, which is then peeled off with a pen-knife, and the wood is thrown away. This bark is applied to the skin to be blistered, previously rubbed with vinegar.

In twenty-four hours a perfect vesication is produced, with little pain, and without the possibility of those symptoms of strangury, which now and then attend the use of cantharides.

BLISTERED, *bullatus*, in *Botany*, is applied to the surface of a leaf, which rises high above the veins, so as to appear like blisters.

BLISTERING *of horses*, in the *Veterinary Art*, a remedy much in use for promoting the removal of a great variety of disorders; more especially, however, in reducing morbid enlargements of bone, or morbid thickenings of any of the softer parts, where its utility is principally obvious.

The vesication of the skin of the horses is attended with some remarkable circumstances, in which it differs from the human, especially in the greater irritability of the skin; for the cuticle of the horse is raised by a blister of less strength, than is required in raising the human cuticle; whence, perhaps, it may be inferred, that its sensation also is more acute. It is probable that the skins of animals covered with hair are, in general, more irritable than naked skinned animals; the spirits of turpentine producing a most painful irritation, both in the horse and the dog, when applied to the skin, but not so in the human.

Irritants, however, of the skin, without any blistering, or vesication, may be had recourse to with very great advantage, in the veterinary art, as they can, without injury to the parts, be very frequently renewed, and with the happiest effects.

The mildest applications of this description, are the animal and vegetable oils; as hog's-lard, and the oil expressed from linseed, or olives: where more irritation is thought requisite, the addition of the essential oil of origanum, or the spirits of turpentine, will readily afford it.

Lard alone, rubbed on the skin of the horse, we have often observed to produce a sensible irritation and increased warmth in the part, so susceptible is this part in these animals; and may serve as a basis from which we may proceed to the higher degrees of stimulus, firing the skin with the actual cautery, in lines more or less close, being the highest degree of irritation to which we can or ought to proceed.

That irritation which is produced by the cantharides, is, of all others, we believe, the most useful in its effects. It should be applied, mixed with lard, or olive-oil; to which it is usual to add the dried juice of the euphorbium; as, however, it is ever desirable to avoid unnecessary complication in the remedies we prescribe, by which our effects are rendered more certain, and the inductions more easy and clear, so we proposed to try this medicine by itself, to ascertain its precise effects; and being mixed with olive-oil, it was applied to the skin of the leg of the horse: no distinct vesication of the part followed, but it produced a considerable heat, and formed a brown scab, with very little discharge of serum; but, on the contrary, was particularly dry and irritating to the horse. We have since omitted it in the blister, and, we believe, without the smallest detriment to its operation; for the cantharides, when they act properly, and are not applied too strong, produce a plentiful vesication, and a copious discharge of thick serum, almost of the consistence of honey.

We have found also the pyro-ligneous acid, or the acid obtained by the distillation of wood, in close vessels, and properly concentrated, a cutaneous irritant, of very useful qualities. After the skin has been simply wetted with it, it slightly inflames it; and the cuticle, after two or three days, comes away dry, bringing with it any foulness of the skin, for the removal of which it is most particularly serviceable.

We have known some, from motives of economy, omit the cantharides in their blister, and use, instead of it, vitriolic acid. It, in general, as far as we have seen, forms a dry, black scab, and is by no means so agreeable in its effects as the former.

It is a common habit with farriers practising medicine, to mix corrosive sublimate with their blister; and, where it may be desirable to destroy the skin, this should be used, but not otherwise; for it is no vesicatory, but a most violent caustic, soon destroying any living matter with which it comes in contact; and we have seen, from the ignorant use of it, the most deplorable effects, by its bringing off extensive sloughings of the skin, and even penetrating to the parts beneath, and so injuring them, as ever after to render the horse unserviceable.

There is an effect produced by the cantharides on the skin of the horse, which, as far as we know, has not met with much attention; though it is very remarkable, and not analogous to its effects on the human skin: it is that prodigious thickening of the integuments, after the operation of the blister, which sometimes does not subside for many weeks, being a great disfigurement: a blister, therefore, if one could be devised not producing these effects, would be a desirable thing in the veterinary Pharmacopæia. This effect, we should, however, remark, is not constant.

BLITAS, Las, in *Geography*, a cluster of small islands in Nicaragua lake, in Spanish North America.

BLITH. See Blyth.

BLITHE, a river of England, which runs into the Trent, 4 miles N. E. of Litchfield.

BLITUM, from βλιτον, *abjiciendum, fit only to be thrown away*, in *Botany*. Lin. Gen. n. 14. Schreb. 18. Juss. 86. Chenopodio-Morus, Boerh. Morocarpus, Rupp. Eng. *Blite*. Fr. *Blête*. Class and Order, *Monandria Digynia*. Nat. Ord. *Holoraceæ*. *Atriplices*, Juss. Gen. Char. *Cal.* perianth three-parted, spreading, permanent; divisions ovate, equal, two more gaping than the other. *Cor.* none. *Stam.* filaments setaceous, longer than the calyx, within the middle division, erect; anther twin. *Pist.* germ ovate, acuminate; styles two, erect, gaping, the length of the stamen; stigmas simple. *Per.* capsule very thin, rather the crust of the seed, ovate, a little compressed, contained within the calyx now become a berry. *Seed* single, globular, compressed, the size of a capsule.

Ess. Char. *Cal.* trifid. *Pet.* none. *Seed* one, with a berried calyx.

Species 1. B. *capitatum*, berry-headed straw-berry blite, Lin. Spec. 6. Reich. 11. Hal. helv. n. 1571. Morocarpus capitatus. Scop. Carn. n. 3. Atriplex. Bauh. pin. 119. n. 7. Prodr. 58. n. 2. Ger. emac. 326. n. 8. Park. 748. f. 1. Mor. hist. 2. 606. f. 5. t. 32. f. 11. Raii hist. 197. n. 5, 7. "Heads spiked terminal." An annual plant, with leaves resembling those of Spinach, and stalk rising, in gardens, about 2½ feet high; but in a wild state, upright and only about a foot high; flowers on the upper part issuing in small heads at every joint, and terminated by a cluster of the same; when the flowers are past, these heads swell to the size of wood-strawberries, and when ripe have the same appearance, full of a purple juice, which stains the hands, and formerly much used in cookery, for colouring puddings, &c. seed black when ripe: commonly called strawberry blite, strawberry spinach, or bloody spinach, and by some, berry-bearing orach. A native of Switzerland, the Grisons, Austria, the Tyrol, Spain, and Portugal; cultivated by Parkinson, in 1633. 2. B. *virgatum*, slender-branched strawberry blite. Lin. spec. 7. Reich. 12. Gmel. sib. 3. 16. Atriplex. Bauh. pin. 119. n. 6. Mor. t. 32. f. 10. Raii hist. 197. n. 6. "Heads scattered, lateral." Seldom growing more than one foot high, with smaller leaves than the former; flowers produced from the axils, almost the whole length of the stalk; small, and collected into little heads, smaller than the first, and not so deeply coloured, but of the same shape. A native of the south of France, Spain, Italy, and Tartary. 3. B. *tataricum*. Mill. Dict. n. 3. B. fragiferum maximum polyspermum. Amm. ruth. "Leaves triangular, sharply toothed; heads simple, lateral." Rising near three feet high; flowers axillary, in small heads; fruits of the same shape and colour with those of the first, but smaller; differing from it in the shape and indentures of the leaves; and in having leaves placed between the fruits the whole length of the stalk, not terminated by heads, as the first, but having leaves above the heads. Probably a variety of the second sort. The seeds were sent to Mr. Miller by Dr. Amman, professor of botany at Petersburgh. 4. B. *chenopodioides*. Linn. Syst. Reich. 12. Mant. 170. "Heads in whorls, juiceless." A low plant, resembling chenopodium. A native of Tartary; now in Sweden. Probably only a variety; and in reality the four sorts seem to be but one.

Propagation and Culture. All are annual plants, which drop their seeds, that will produce plentifully the following spring; or if the seeds of any one of them be sown in March or April, upon a bed of common earth, in an open situation, the plants will come up in a month or six weeks, and remaining in the same place, will require no other care besides being kept from weeds, and thinned out to the distance of six or eight inches apart; and in July the plants will begin to shew their berries, which will make a pretty appearance. By many they are transplanted into the borders of the flower garden, and by others planted in pots, so as to be ready for removal into the court-yard, or for being placed upon low walls for ornament. When these plants are designed to be removed, they should be transplanted before they shoot up their flower-stems, for they will not bear transplanting afterwards; and when planted in pots, they must be watered in dry weather; and, as the flower-stems advance, they should be supported by sticks. Martyn.

Blitum. See Achyranthes, Amaranthus, Chenopodium, and Gunnera.

BLOATED *fish* or *herring*, in our *Statutes*, are those which are half dried. Vide Stat. ann. 18 Car. II. c. 2.

Bloated herrings are made by steeping them in a peculiar brine, and then hanging them in a chimney to dry.

BLOATING, in *Medicine*. See Leucophlegmatia, and Œdema.

BLOCH, Mark Eleazar, in *Biography*, a Jewish physician at Berlin, and a celebrated ichthyologist, was born at Anspach in Franconia. His parents were in a condition so obscure and destitute that they were scarcely able to maintain him during his infancy, and much less to procure for him any suitable means of education. At the age of 19 he understood neither German nor Latin; and as he had read only a few Rabbinical books, he spoke a kind of Franconian gibberish, intermixed with the Jewish jargon. About this time, however, he was taken into the house of a surgeon at Hamburgh, who was a Jew, and employed by him in the instruction of his children; and in this situation he acquired a competent knowledge of the German language. The savings of his scanty salary enabled him to procure assistance in the study of Latin. Having also gained some knowledge of surgery, he repaired to Berlin, where his relations lived, with a view of prosecuting the study of anatomy. After struggling with various difficulties, he was admitted as doctor in the university of Franckfort, and returned to Berlin for the exercise of his profession. Here he became acquainted with M. Martini, who recommended him to be elected a member of the Society of the Friends of Nature. In order to promote the objects of this institution, he undertook a natural history of the muræna, a fish caught, as it was supposed, only in the lakes of Pomerania. He also began to form a cabinet of natural history; and having made a considerable collection

of aquatic animals from all parts of the globe, he determined to write a natural history of fishes; and in this design he was encouraged and aided by obtaining possession of the original MSS. of Father Plumier, who had made three voyages to America, and brought with him many objects highly interesting to the natural historian. M. Bloch first published, in German, four numbers of an "Economical Natural History of Fishes, particularly those in the states of Prussia, with figures from original drawings;" Berlin, 1781 and 1782, large 4to. In the following years appeared an "Economical Natural History of the Fishes of Germany," in 3 volumes, consisting of 108 plates, and including the three numbers already mentioned. He afterwards published, in 9 volumes, "The Natural History of foreign Fishes;" so that his whole work was comprehended in 12 volumes, and contained 432 plates. The last appeared in 1795. He also, at his own expence, procured a French translation of his work, by C. Laveaux, then at Berlin, which he published under the title of "Histoire general et particuliere des Poissons," Berlin, 1785—1788, in 6 vols. folio, with 216 plates. In order to defray the expence of this work, his only son, a young man distinguished by his talents, undertook a tour through France and England for the purpose of procuring subscriptions; and in the prosecution of his journey died at Paris, in 1787. This loss, and the embarrassment of his circumstances, preyed upon the spirits of this ingenious naturalist, and sunk him into the deepest affliction. However, he still continued to employ himself in his favourite work, the history of fishes, and having completed it, undertook a journey to Paris. He died at Carlsbad in Bohemia, August 6th, 1799. Besides the above voluminous works, M. Bloch published many memoirs on subjects of natural history, in the transactions of different societies. That on the muræna, in the Memoirs of the Friends of Nature, has been already mentioned; he also communicated, in the same Memoirs, "Observations on the regular depressions in vitriform stones;" "On the worms in the intestines and lungs of birds;" "An Essay towards the natural history of the worms which live in other animals;" "On worms of the bladder; "Description of the bustard, and some kinds of birds found in marshes;" "On the oil of herrings;" "On the vulgar opinion that the organ of generation in the ray and shark is double;" "On the myxina glutinosa of Linnæus," &c.

BLOCK, Daniel, an eminent portrait-painter, was born at Stettin, in Pomerania, in 1580, and educated for his profession under Jacob Scherer. As a painter of portraits, he gained great reputation, and had the honour of painting the portraits of Christian IV. king of Denmark, and of Gustavus Adolphus, king of Sweden. His merit recommended him to the prince of Mecklenburg, in whose service he was retained for 44 years, and for whom he painted the portraits of his whole family, at full length, as large as life, and in the antique habit. By the agreeable manner of his colouring, and the easy attitudes of his figures, he obtained so much employment, as to enable him, before the decline of his life, to amass a large fortune; of which, however, he was unfortunately deprived by a plundering party, preserving, with great difficulty, his own life. He died in 1661. Pilkington.

Block, Jacob Roger, was born at Gouda, where he acquired the art of painting, particularly in reference to perspective and architecture, which he principally cultivated. Having spent several years in Italy, where he imbibed that taste of grandeur and elegance in his compositions, by which he was advanced in the public esteem above all his contemporaries, he returned to his own country, and was appointed state-painter to the archduke Leopold, whom he attended in all his campaigns; but whilst he was passing a small rivulet, over a bridge of planks to view the fortifications of St. Vinox in Flanders, his horse slipped, and he was unfortunately drowned. Whilst he lived at Gouda, he was visited by Reubens, who, having examined his works, testified to his honour, that he had not seen any painter in the Netherlands, who could stand in competition with him for the subjects he painted. The time of his birth and death are not ascertained. Pilkington.

Block, Benjamin, son of Daniel Block, was born at Lubeck in 1631, and, with a view of improving himself in colouring and design, resided for some time at Rome, Venice, and Florence. Having thus acquired a good taste, and a pleasing tone of colouring, he was introduced to the court of Saxony, where he painted several portraits of the elector and prime nobility; and he also painted several altar-pieces for the churches and convents of Hungary, which are much commended. His capital performance is the portrait of Kircher the Jesuit, which, even at Rome, was exceedingly admired. The time of his death is not ascertained. Pilkington.

Block is used for a piece of marble as it comes out of the quarry, before it has assumed any form from the hand of a workman.

Block, in the *Mechanic Arts*, a large piece of solid wood, whereon to fasten work, or to fashion it; strength and stability being the requisite properties.

In this sense we say a chopping block; a sugar-finer's block; a smith's block, on which his anvil is fastened; an executioner's block, on which the criminal's head is laid to be struck off.

Block, *Mounting*. See Anabathra.

Block, among *Cutters of Wood*, is a form made of pear-tree, box, or other hard and close grained wood, free from knots, on which they cut their figures in relievo, with knives, chissels, &c. The like are in use for card-making; and from the same first arose the modern art of printing. Phil. Transf. N° 310. p. 2398.

Block, among *Bowlers*, the mark which is aimed at, being a small sized bowl laid on the green for this purpose; it is called also the *jack*.

Block, in *Falconry*, denotes the perch whereon a bird of prey is kept. This is to be covered with cloth.

Block *Island*, in *Geography*, called by the Indians "Manisses," lies about 21 miles S.S.W. of Newport, in Newport county, and state of Rhode Island. It was erected into a township, named "New Shoreham," in 1672. This island is 7 miles in length, and its extreme breadth is 4 miles. It has 714 inhabitants. It is famous for cattle and sheep, butter and cheese; and round its coasts are caught considerable quantities of cod-fish. The southern part of it is in N. lat. 41° 8'.

Block, in *Naval Architecture*, denotes an eight square, or round part below the heeling of the main and fore top-masts.

Blocks are short pieces laid under a mast to raise it from the ground.

Blocks are also pieces of wood belonging to ships, in which the shivers, or sheaves, of pullies are placed, and wherein the running ropes go. Accordingly they possess the properties and powers of pullies, and they have from one to eight sheaves. The blocks in general use are the single block, the double block, the treble block, and the four-fold block; but when heavy weights or bodies are to be raised or moved, blocks with a greater number of sheaves are applied, the increasing power being as two to one for every sheave moving with the object. See Pulley.

Blocks differing from the common shape are the bee-block, the cheek-block, the long-tackle-block, the main-sheet-block, the monkey-block, the nine-pin-block, the rack-block, the

ſhoe-block, the ſhoulder-block, the ſiſter-block, the ſnatch-block, the ſtrap-bound-block, the viol-block, and the warping-block. The principal parts of blocks are their ſhells, ſheaves, and pins, which are of various ſizes and powers, according to the effect which they are to produce. The dimenſions of the ſhells, and the thickneſs and number of the ſheaves, are proportioned to the ſize of the ropes working in them, and the powers required. The ſheaves turn abreaſt of each other in the ſhell, on one axis or pin, or one above another, on ſeparate pins. The ſhell is made of elm or aſh, and hollowed between the cheeks, with one or more ſheave-holes to receive the ſheave or ſheaves. On the outſide of the cheeks of blocks that are to be ſtrapped, one ſcore is cut towards the ends, in which part of the ſtrap is buried; if they are double-ſtrapped, they have two ſcores. A hole is bored through the centre to admit the pin; which, paſſing through both ſides of the ſhell, forms the axis for the ſheaves. The ſheave is a ſolid cylindrical wheel, and round its circumference is a groove, one-third of the thickneſs of the ſheave deep, in which the rope works. It is commonly made of lignum vitæ; but for laborious purpoſes, it is coaked in the middle with metal, or elſe made of caſt metal; if the ſheave is iron, it is coaked with braſs, and if of braſs, with the hardeſt bell metal. The hole in the centre is ſomewhat larger than the pin. The pin is made of lignum vitæ, cocus, greenheart, which is a wood imported from the Weſt Indies, or iron, and it is the axis on which the ſheaves turn.

The proportions for ſingle, double, treble, four-fold blocks are as follow; viz. the length is eight times the breadth of the ſheave-hole, which is one-ſixteenth of an inch more than the thickneſs of the ſheave; and this is one-tenth more than the diameter of the rope for which it is intended, and the diameter of the ſheave is five times the thickneſs. The breadth of the block is ſix times the thickneſs of the ſheave, and the thickneſs about one half the length. Flat thin blocks are three-eighths of the length thick; but all blocks, having more than one ſheave, are increaſed in thickneſs more than in the above proportion by the additional number of ſheave-holes, and middle-parts or partitions; the thickneſs of each partition being one-ſixth leſs than the breadth of the ſheave-hole. Theſe dimenſions are variable, according to the uſes for which blocks are intended. Very large and four-fold blocks are formed of ſeparate pieces, as the cheeks, partitions, &c.; and when thus made, they are denominated "made-blocks." The ſhells of blocks are firſt ſawed to their length, breadth, and thickneſs; and the corners or angles are taken off. The workman then gauges the ſize of the ſheave-hole in the middle, one ſixteenth larger than the thickneſs of the ſheave, and once the thickneſs longer than the diameter, for a ſingle-ſheaved block. In blocks of two ſheaves, the partition is kept in the middle, and is one-ſixth leſs than the ſheave-hole; each ſheave-hole is gauged equally on each ſide, and ſo for all blocks with a greater number of ſheaves. The blocks are then jambed up edgeways with wedges in a clave, and the ſheave-holes are made in this manner: the length and breadth are firſt gouged out, and holes are bored half way through the block, along the part gouged out, with an augre of the ſize of the ſheave-hole; then the ſheave-hole is gouged and bored on the oppoſite ſide in the ſame manner, ſo as to meet the oppoſite holes. Blocks from 10 inches and upwards have one hole bored at each end, and cut through with a chiſſel; and the wood is ſawed out with a rib-ſaw. All blocks have the ſheave-holes cleared through by chiſſels, and by burrs at the corners. Blocks that are to have iron ſtraps, ſhould have the ſtrap fitted on before the wood is cut out of the middle. The hole for the pin is bored through the middle of the block, one-tenth leſs than the diameter of the pin. The outſides and edges of the ſhell are next rounded off by the ſtock-ſhave, and neatly finiſhed by the ſpoke-ſhave. In the royal navy, blocks are left thick upon the edges of the cheeks; but in the merchant ſhips, the edges are ſometimes thinned off to a ſmall ſquare, and ſometimes rounded off. The ſcores for the ſtraps are gouged out along the outſides of the cheeks, and taper in depth from nothing at the pin to half the thickneſs of the ſtrap at the ends of the block, for a ſingle ſcore, and the ſame on each ſide of the pin for a double ſcore. The ſcores are gouged down, acroſs the breaſt of the block, to half the ſize of the ſtrap, in order to allow for the ſerving. After the ſcore is cut, the ſheaves are fitted; they are one-tenth thicker than the diameter of the rope intended for running on them, and five times that thickneſs in diameter. The hole for the pin ſhould be bored through the centre by a bitt fixed in the mandrel of a turning lathe, or with a ſtock and bitt, and reamed with an augre one ſixteenth larger than the diameter of the pin, that it may eaſily turn; they are then put in a lathe and turned ſmooth, and the outer circumference hollowed one-third of its thickneſs, that the rope may embrace it cloſely. The diameter of the pin is the thickneſs of the ſheave, and is turned in a lathe, except its head, which is left eight ſquare, to prevent its turning in the block, and is driven through the holes in the block and ſheaves. After the ſheaves are fitted, the inſide of the ſheave-hole, at the arſe of the block, is gouged hollow, to admit the rope, and correſpond with the ſheave; and a ſmall neat chamfer is taken off the edges.

Blocks, *Bee*, are made of elm, in length ſeven-ninths the length of the bee, in depth two inches for every foot of length, and in thickneſs ſeven-eighths of the depth. A block of this kind is trimmed ſquare, chamfered on the outſide edges, and fitted with a ſheave in one end; and in the other end is cut a hole, to be fitted with a ſheave, in caſe the other ſhould fail. The ſheave-hole is $\frac{2}{7}$ths of the length of the block, and $\frac{1}{4}$th the length of the ſheave-hole in breadth, and half the length of the ſheave-hole within the end. Bee-blocks are bolted to the outer ends of bowſprits, under the bees, and the bolts ſerve like the axis or pin for the ſheaves to work upon; the fore-top-maſt ſtay reeves through the ſheave-hole at the fore-maſt end of the ſtarboard bee-block, and the fore-top-maſt preventer, or ſpring-ſtay, through the ſheave-hole at the after-end of the larboard bee-block.

Blocks, *Brail*, in rigging the mizen-yard, are ſtrapt together in one ſtrap, and lie over the yard, and ſeize together underneath; the throat-blocks next the cleats to the maſt; the middle-blocks in the middle between the throat-block and peek; the peek-blocks about three or four feet within the cleats at the peek.

Blocks, *Bunt-line*, are laſhed in rigging the lower-yards, like the leech-line blocks in the middle between them and the ſlings of the yard. Theſe, in rigging the top-ſail yards, are ſpliced round the ſtrap of the top-ſail-tye-block upon the yard.

Block, *Cat*, is employed to draw the anchor up at the cat-head. See Cat-heads.

Blocks, *Cheek*, or half-blocks, are made of elm-plank; the length being twice and a half the depth of the top-maſt head; the breadth is ſeven-eighths of the depth of the top-maſt head, and the thickneſs half that depth. The depth of each tenon, and thickneſs of the cheek, when the ſheave-hole is cut, is each three-eighths of the whole thickneſs, ſo that the remaining two-eighths are the ſheave-hole. The three tenons are each two inches ſquare, one in the middle, and one at each end; and the length of the holes is more than the breadth of the block, by the thickneſs of the ſheave. The back of the block is divided into three parts, and one-third on each ſide is bearded down to one-third the thickneſs of the cheek on each edge. Pins of iron are made for faſten-

faſtening them to the top-maſt head, and for durability the ſheave-holes are coppered. Cheek-blocks are bolted to the thwart-ſhip ſides of top-maſt heads, cloſe up under the cap, the bolts ſerve as the pin or axis for the ſheaves to work on; the jib-ſtay and haliards, and fore-top-maſt ſtays, ſail-ſtay, and haliards reeve through the cheek-blocks at the fore-topmaſt-head, and the main-topmaſt-ſtay ſail haliards, and middle-ſtay, ſail-ſtay, and haliards reeve through the cheek-blocks, at the main-topmaſt head.

Blocks, *Clue-garnet*, ſerve to draw the clues, or lower corners of the courſes up to the yards, and are faſtened to the clues of thoſe ſails. In rigging the lower-yards, theſe laſh through the eyes upon the yard; the blocks hanging underneath, four feet without the middle cleats on each ſide. See Clew-*garnet*.

Blocks, *Clue-line*, in rigging the ſprit-ſail yard, are ſtrapped with two eyes, and are laſhed through thoſe eyes round the yard, three feet without the ſlings; the laſhing to be upon the yard. In rigging the ſprit-ſail top-ſail yard, theſe blocks are ſtrapped with two eyes, and are laſhed through thoſe eyes round the yard, about two feet without the ſlings. The clue-line blocks, in rigging the top-ſail yards, are ſtrapt with two laſhing eyes, and laſh upon the yard three feet without the ſlings; the blocks hanging underneath the yard through which the clue-line reeves, and is ſtrapt with a knot, and leads down upon the deck. In rigging the top-gallant yards, theſe blocks are ſtrapt with two laſhing eyes, and laſh upon the yard three feet without the ſlings. The blocks hang under the yard, through which is reeved the clue-line, which is ſtopt with a knot. The leading part leads down the maſt, and into the lower ſhrouds. Some ſloops and light-rigged veſſels have no clue-line blocks; they lower the yard.

Blocks, *D*, are lumps of oak in the ſhape of the letter D, from twelve to ſixteen inches long, and eight or ten inches wide. They are thirded and bearded on the back, and the edges beaded. A ſheave-hole is cut through the middle fore and aft. It is bolted to the ſhip's ſide, in the channels, to reeve the lifts, &c.

Blocks, *Deep-ſea-line*, are the ſame as a wooden ſnatch-block (which ſee,) only ſmaller; generally from nine to eleven inches long.

Block, *Derrick*, in rigging the mizen-yard, is ſtrapt with eyes, that go round the yard, and laſh underneath, between the ſlings and the outer yard-arm or peek; the other block is croſs-ſeized into the ſtrap, has an eye ſpliced in each end, and lies upon the mizen cap, and ſeizes or hangs through the eyes under the cap, or upon the upper ſide of it.

Block, *Fiſh*, is hung in a notch at the end of the davit, and ſerves to haul up the flukes of the anchor to the ſhip's bow.

Blocks, *Girt-line*, in rigging the fore-maſt, and main and mizen maſts, are laſhed round the maſt head, above the ſtop of the cap, one to hang on each ſide. The girt-lines that reeve through them lead down upon deck, for hoiſting the rigging-tops, and croſs-trees, and the perſons employed to place the rigging over the maſt-head.

Blocks, *Leech-line*, in rigging the lower yards, are laſhed round the yard, and through the eye of the ſtrap, ten feet within the cleats on each yard-arm; the blocks hang on the fore-part of the yard.

Blocks, *Lift*, in rigging the lower yards, are ſpliced into the ſtrap of the topſail-ſheet blocks; the lifts reeve through the block in the ſpan round the maſt head, between that and the top-maſt, then lead down abreaſt the ſhrouds, and reeve through a block faſtened to the ſide, and are there belayed. In rigging the topſail-yards, the lift-blocks are ſtrapt with an eye to the ſide of the yard arm. The lift reeves through the lower ſheave in the ſiſter block in the top-maſt ſhrouds, and through the block on the yard-arm. The ſtanding part hooks to a becket round the topmaſt-cap, and the leading part leads down the ſide of the maſt, and belays to the dead-eyes in the lower ſhrouds.

Block, *Long-tackle*, reſembles two ſingle-blocks joined together endways, one being two-thirds leſs than the other. The ſhell is made of aſh, or elm, two-thirds longer than the proportion for a ſingle block. Theſe blocks are uſed for tackles, and are made according to the ſize of the rope, as other ſingle blocks. They are uſed in the Royal Navy and Eaſt India ſervice as yard-tackles; but in the merchant ſervice as loading tackles.

Blocks, *Made*, have the ſhell formed of ſeveral pieces of elm-plank, ſuited to the thickneſs of the cheeks, ſheave-holes, and middle parts, and are ſtrongly bolted together with three bolts at each end, driven through and clenched on a ring at the points. Theſe blocks have flatter cheeks and more ſquare edges than other treble and four-fold blocks. Of this ſort are large treble and four-fold blocks, for heaving down ſhips, or other heavy purchaſes. Smaller made blocks, of modern invention, are formed of two pieces, joining in the middle; the pin working on patent rollers, let into the inſide of the cheeks, which are bolted or rivetted together at the ends. Theſe blocks are thought too complex for the Royal Navy, and are not ſo eaſily remedied in caſe of failure.

Block, *Main-ſheet*, is uſed for the ſheet-tackle of the mainſail-booms of ſmall veſſels, and is ſingle or double; the ſheet or fall being always belayed round the pin. The ſhell is made of aſh or elm, one half longer than the proportion for ſingle or double blocks; the additional length is tapered, and a hole bored through between the ſheaves and the end, to admit the ſtrap; the length of the pin is the length of the block, and is ſimilar to a belaying pin, for which purpoſe it is ſometimes uſed.

Blocks, *Monkey*, are ſometimes uſed on the lower yards of ſmall merchant ſhips, to lead (into the maſt or down upon deck) the running rigging belonging to the ſails. The ſhells are made of aſh or elm; ſome are only ſmall ſingle blocks, attached by a ſtrap and iron ſwivel to iron-ſtraps that embrace and nail to the yard, the block turning to lead the ſmall running-ropes in any direction; others are nearly eight-ſquare, with a roller working in the middle, the ſame as a ſheave, with a wooden ſaddle beneath, to fit and nail to the yard.

Blocks, *Nine-pin*, are uſed to lead the running-ropes in an horizontal direction. The ſhells, made of aſh or elm, reſemble the form of a nine-pin, though flatted on the ſides; their lengths are generally confined to the place in which they are fixed, and this is for the moſt part under the croſs-pieces of the fore-caſtle and quarter-deck bitts. The breadth of the block, ſheave, &c. is governed by the rope, and tapers at the ends to three-eighths of the breadth of the middle; the pin at each end, ſerving as a vertical axis, is two-thirds of the bigneſs of the end. The thickneſs is five-eighths of the breadth. Theſe blocks may be turned in a lathe, and flatted afterwards with a ſpoke-ſhave.

Block, *Quarter*. See *Thick and thin* Block.

Blocks, *Rack*, are a range of ſmall ſingle blocks, made from one ſolid, by the ſame proportions as ſingle blocks, with ends, in form of a dove's tail, for the laſhing, by which they are faſtened athwart the bowſprit, to lead in the running ropes. They are ſeldom uſed.

Blocks, *Shoe*, are two ſingle blocks, cut in a ſolid piece, tranſverſely to each other. They ſerve for legs and falls of the bunt-lines, but are ſeldom uſed.

Block, *Shoulder*, is a large ſingle block, left nearly ſquare at the lower end, or arſe of the block, and cut ſloping

in the direction of the ſheave. Shoulder-blocks are uſed on the lower yard-arms, to lead in the top-ſail ſheets; and, on the topſail-yards, to lead in the topgallant-ſheets; and by means of the ſhoulder, are kept upright, and prevent the ſheets from jambing between the block and the yard: they are alſo uſed at the outer end of the boomkins, to lead in the fore-tacks.

Blocks, *Siſter*, are made of aſh, ſimilar to two ſingle blocks, and are turned out of a ſolid piece, about twenty inches long, one above the other; between the blocks is a ſcore for a middle ſeizing: a round head is turned at each end, and hollowed underneath, to contain the end-ſeizings; along the ſides, through which the pins are driven, is a groove, large enough to receive part of the topmaſt-ſhroud, in which it is ſeized. In theſe blocks reeve the lifts, and reef-tackle-pendents, of the topſail-yards.

Blocks, *Slab-line*, in rigging the lower-yards, are ſtrapt with a ſhort laſhing-eye, that ſeizes to the ſpan of the quarter-blocks underneath the yard.

Blocks, *Snatch*, are proportioned by the rope, as a ſingle block, leaving twice the length for the ſcore and laſhing; they taper from the ſheave to the laſhing end, to half the breadth and thickneſs at the ſheave; one ſide of the ſhell is cut acroſs above the ſheave, large enough to admit the rope or fall. In the Royal Navy, ſnatch-blocks are iron-bound, terminating at the ſmall end with a ſwivel hook, or an eye, large enough to receive ſeveral turns of laſhing; that part of the ſtrap, over the notch in the ſide, lifts up with a hinge, and is confined down, when the rope is in the block, by a ſmall iron hook, or latch, that hooks in the eye of a toggle-bolt, and that ſecures the upper end of the ſtrap; the hinged part of the ſtrap goes over the bolt, with a hole in the end; the ſtrap is let into the block its thickneſs, and is confined by the pin and nails; they are uſed for heavy purchaſes, and where a warp, or hawſer, is brought to the capſtern. Snatch-blocks, not iron-bound, have a large hole bored through the tapering end of the ſhell, for the laſhing. They are uſed for the main and fore ſheet blocks of ſquare-rigged veſſels.

Block, *Spring*, a new kind of block, invented by Francis Hopkinſon, eſq. of Philadelphia, and deſigned to aſſiſt a veſſel in ſailing, by increaſing the acting ſpring of her rigging. It is propoſed to apply it to all ſuch parts of the rigging as will admit of it with ſafety and convenience, and where its operation will be moſt advantageous; but particularly to the ſheet ropes, and, if practicable, to the dead-eyes, in lieu of what are called the chains. A, (ſee *Plate of Ship*) is a block made in the uſual manner, having a ring, or eye, B, at one end. C, is a ſpiral ſpring, linked at one end to the hook D E, and at the other to the ring F, which is to be annexed by a ſtaple to the timber-head, or by ſome other means to the place where it is to be applied. The ſpring C muſt be of well-tempered ſteel, and proportioned in ſtrength to the ſervice it is to perform. Within the cavity or pipe, formed by the ſpiral ſpring, there muſt be a chain of ſuitable ſtrength, called a check-chain (repreſented ſeparate at G), connected by the links to the hook D E and ring F. When the ſpring is not in action, this chain is ſlack; but when the ſpiral ſpring is extended, by the force of the wind, as far as it can be without danger of injury, the check-chain muſt then begin to bear, to prevent its farther extenſion, and, if ſtrong enough, will be an effectual ſecurity againſt failure.

Fig. 2. repreſents part of the gun-wale of a ſloop, with the ſpring-blocks in action, one of them hooked to a ſtaple in the timber-head, and the other to the corner of the jib.

The inventor of this machine apprehends, that a veſſel thus furniſhed will be leſs liable to heel; and that ſhe will receive the impulſes of the wind to better advantage, and ſail with a more lively and equable motion than if rigged in the common way. Tranſactions of the American Philoſophical Society, vol. III. art. 40.

Blocks, *Strap-bound*, are ſingle blocks, with a ſhoulder left on each ſide, at the upper part, to admit the ſtrap through, a little above the pin. Theſe blocks are uſed at the clues of the ſquare-ſails, for the clue-garnets or clue-lines, and under the yards; the ſhoulder preſerves the ſtrap from chafing.

Block, *Thick and thin*, or *Quarter*, is a double block, with one ſheave thicker than the other, and is uſed to lead down the topſail-ſheets and clue-lines. In the merchant ſervice they are uſed ſingle, thick and thin. In rigging the lower yards, they are ſtrapt with a long and ſhort leg, with a laſhing eye ſpliced in the ends, and laſh to the yard within the cleats, in the middle of the yard, the block hanging downwards. The long leg comes up the aft-ſide, and meets the ſhort leg on the fore-ſide, and there laſhes through the eyes. Although theſe are uſed for the topſail ſheets, and intended for the clue-lines, a ſingle block would be cheaper and better; as the thin ſheave is ſeldom uſed for the clue line, it being found rather to impede than to facilitate. Small ſhips, in the merchant ſervice, have a double block laſhed in the middle of the yard, as the quarter block through which the ſheets reeve, and lead down on oppoſite ſides. Large ſhips, in the merchant ſervice, have a ſingle block laſhed on each ſide of the middle of the yard, and the ſheets reeve on their reſpective ſides, and lead down by the maſt. A quarter block, in rigging the croſs-jack-yard, is ſtrapt with a double ſtrap, with an eye in each of the four ends, and is laſhed upon the yard in the middle between the cleats.

Block, *Top*. See Top-Rope.

Blocks, *Top-Gallant-Sheet*, in rigging topſail yards, are ſtrapt with two laſhing-eyes, and laſh upon the yard, cloſe within the clue-line-blocks on each ſide.

Blocks, *Topſail-Sheet*, in rigging the lower yards, are put over the yard-arms, ſtrapt with an eye of the ſize of the yard-arm.

Blocks, *Tricing*, for the yard-tackles, are ſtrapped with a ſhort laſhing-eye, that ſeizes round the yard about one third of the length within the arm cleats; the blocks hanging under the yard.

Blocks, *Tye*, in rigging the topſail-yards, laſh at the topmaſt-head cloſe up to the rigging, under the collar of the ſtay, as the lower ones; and the blocks on the yards laſh under the fore-part of the yard, as the lower ones, and reeve with a double tye, in large ſhips, and with a ſingle tye, like the lower, in ſmall ones. The ſtanding parts of the double tyes clinch round the maſt-head, then reeve through the double block upon the yard, and up again, and reeve through the block on each ſide of the maſt-head. The blocks are then ſpliced in their lower ends, and connected by their haliards to a ſingle block, that is ſtrapt with a long ſtrap, with a hook and thimble, that hooks to a ſwivel-eye-bolt in the channel on each ſide; the leading-part comes in through a block laſhed on each ſide; the foremoſt ones abaft the forecaſtle, and the after ones on the quarter-deck.

Block, *Voyol* or *Viol*, is a large ſingle-ſheaved-block; the length is ten times the thickneſs of the ſheave-hole, which is three-eighths more than the thickneſs of the ſheave; the thickneſs of the ſheave is one-tenth more than the diameter of the viol, and the diameter of the ſheave is ſeven times the thickneſs. The breadth of the block ſhould be eight times the thickneſs of the ſheave, and the thickneſs two-ſevenths of the length. This block is double ſcored, the

the ſheave is coaked with braſs, and the pin is iron, and nearly as thick as the ſheave. It is uſed in heaving up the anchor. The viol paſſes round the jeer-capſtern, and through the block, which is laſhed to the main-maſt; and the cable is faſtened in a temporary manner to the viol in ſeveral places. It is ſeldom uſed except in the largeſt ſhips of the Royal Navy.

Block, *Warping*, is made of elm or aſh board, ſhaped like the body of a bellows; the ſides or cheeks are 8½ inches broad in the middle, and tapered to 2 inches broad at the ends; the back, or longeſt cheek, is 16 inches long, and ⅝ths of an inch thick, with a hole bored through the upper end to receive a leathern ſtrap; the upper cheek is 12 inches long, and ⅝ths of an inch thick, except the lower end, which is 1⅓ inch thick, and forms the ſheave-hole. The ſheave is, 1⅛ inch thick, and 7½ inches in diameter, made of lignum vitæ, coaked with braſs; it is let into the cheeks one-eighth of an inch, to prevent the yarn from getting between the ſheave and the cheeks. The cheeks are faſtened together at the lower end with three ſcrews and nuts; and the pin, which is iron, is ſeven inches long, driven through the middle of the block, with a ſhoulder on the upper ſide, and clinched at the point on the lower ſide of the ſhell; the upper part of the pin is tapered ſmall, and a wooden handle rivetted upon it. The cheeks have a broad chamfer round the outer edges; the inſide edges, and inſide of the block above the ſheave, are lined with thin iron neatly ſcrewed on, to prevent the block from wearing. This block is finiſhed in a neater manner than blocks in general, and is ſeldom uſed but by rope-makers, to warp off the yarn into hauls for tarring.

Blocks, *ſingle*, *double*, or *treble*, in *Rope-making*, are ſtrapped with a hook and thimble, and reeved with a rope, called the tackle-fall, which is uſed to ſtretch the yarn to its full extent, before the preſs is put on, by a capſtern, or crab, at the lower end of the rope-walk. The fall is then belayed, until every yarn is hove through the ſtrands and brought down, ſo that the rope may not exceed the circumference intended. For other blocks, ſee Bulls'-*eyes*, Dead-*eyes*, and Euphroes. See *Plates* of *Ships*.

Blocks, *Strapping of*. A ſeventeen-inch block has a five-inch rope ſtrap, and every inch in length above or under, to a twelve-inch block, has half an inch more or leſs ſized rope allowed for the ſtrap; a 11-inch block has a 3-inch ſtrap; a 10 and a 9-inch block, 2½ inches; an 8 and 7-inch block, 2 inches; a 6-inch block, 1½ inch; a 5-inch block, 1 inch; and a 4-inch block, ¾ of an inch. The ſcore round iron-bound blocks is taken out to the ſize of the iron-ſtrap, ſufficient to bury it, except at the pin. Iron ſtraps are from ¼ of an inch to 1 inch in thickneſs, and nearly three times the thickneſs in width; the thickneſs of theſe ſhould correſpond to the ſtrain which they are to reſiſt. The cat-block muſt have a ſtrong ſtrap and large iron hook, which hooks the ring of the anchor in catting. The top-block ſhould have a ſtout iron binding, with a ſtrong ſhort hook. Top tackle blocks have ſtrong iron bindings, the upper block with a tackle-hook, and the lower block with a ſwivel-hook. The ſwivel, in iron-bound blocks, ſerves to turn it occaſionally, in order to untwiſt the parts of the rope that form the tackle, as the mechanical power is greatly reduced thereby.

In rigging, the whole length of all the different ſizes of block-ſtrapping is got upon the ſtretch, and hove out tight for worming and ſerving; it is then wormed and ſerved, and cut into ſhorter lengths, to ſuit the different blocks. The ſtrapping of jeer-blocks is wormed, parcelled, and ſerved; ſtrapping of 4 inches diameter, and above, is wormed and ſerved; and all under 4 inches is only ſerved with ſpun yarn; except the ſprit-ſail brace, bunt-line, and leech-line blocks, that are laſhed under the tops, which are only ſerved with ſpun-yarn over the ſplice, and the tail left half a fathom in length. Jeer-blocks are double ſcored, and the double and treble blocks are ſtrapped with a double ſtrap, thus: it is ſpliced together at the ends, and, when doubled, to be the ſize of the block and circumference of the yard; it is then doubled, and the block ſeized in the bight, with a long and ſhort leg; the ſplice lying in the arſe of the block.

The ſcores of all blocks are to be well-tarred, and the pin and ſheave examined, before the ſtrap is put on. The block is ſet with into the ſtrap with wedges, thus: the four parts are frapped together with rope-yarn under the block, with a chock between, and the wedges are ſet between the breaſt of the block and chock. Then the ſtrap is nippered, with a heaver, round the block; the wedges, chock, and frapping, taken away, and the block hung upon the ſtake-head, or poſt, and the ſtrap well ſeized together, cloſe under the block, with nine under and eight riding turns, every turn ſtrained tight round by a heaver, and croſſed each way with two turns.

Jeer-blocks, for the maſt-heads, are ſtrapped with long eyes, to receive many turns of the laſhing; and the block is ſeized into the ſtrap as before, as are all ſeizing blocks, in proportion to their ſizes. The ſtraps are cut agreeable to the following table.

A TABLE of the Dimenſions of Straps for Laſhing and Seizing Blocks.

Size of the Blocks.	Circumf. of the Straps.	Length of the Straps.	
Inches.	Inches.	Feet.	Inches.
17	5	7	4
16	4½	6	8
15	4	6	0
14	3½	5	4
13	3½	4	11
12	3½	4	6
11	3	4	2
10	3	3	9
9	2½	3	4
8	2½	3	0
7	2½	2	9
6	2	2	6
5	1½	1	9
4	0¾	1	6

Blocks, ſtrapped with eyes or thimbles ſpliced in the ends, are ſeized tight into the bight, and the legs left long enough to laſh through the eyes, round a maſt, yard, &c. as the top-ſail clue lines, clue-garnets, and ſprit-ſail clue lines, &c.

Blocks ſtrapped with a thimble, or hook and thimble, have the ſtrap ſpliced together at the ends. The block is fixed in one bight, for the ſplice to lay on the arſe of the block, and the thimble in the other bight; the ſeizing is put on, between the block and thimble, with eight under and ſix riding turns, according to the ſize of the block, each turn ſtrained tight by a heaver; the turns double croſſed, and the end ſtopt with a wall-knot crowned.

Blocks ſtrapped with double tails, are fixed in the ſtrap, ſimilar to blocks with eye-ſtraps: and thoſe with a ſingle tail are ſpliced in, and ſerved with ſpun yarn over the ſplice.

Girtline blocks are ſtrapped in the houſe, and the girtlines reeved. See Elements and Practice of Rigging, &c. vol. i.

Block-*and-Block*, in *Sea-Language*, denotes the situation of a tackle, when the effect is destroyed by the blocks meeting together.

Block-*wood*, is a name sometimes given in our laws to logwood. 23 Eliz. c. 9.

BLOCKADE, in the *Military Art*, signifies the method adopted in cutting off all communication between a town which it is intended to reduce by famine, and the neighbouring country. It is effected by posting troops on all the passages and avenues leading to and from the place; preventing any supplies of provisions or reinforcements from being thrown in by the enemy, and thus, in course of time, starving the garrison into a surrender. A blockade differs from a regular siege, inasmuch as there are no trenches or attacks. Blockades are principally formed by the cavalry. The term probably owes its origin to the German expression *blochus*, or *blockhause*, a *bulwark*, or *house of wood;* or to the Gaulish *blocal*, a *barricade;* though others derive it from the Latin *baculare*, signifying *to stop a passage*.

The word is sometimes used in speaking of the commencement of a siege, when detachments are sent forward to seize the principal avenues, and occupy the ground on which the besiegers intend to fix their quarters.

To *raise a blockade* is to force the troops, which keep the place blocked up, from their posts.

The only method of reducing fortresses in the more remote ages of antiquity, was by blockade. The town was completely invested by a wall of masonry constructed around it, and furnished at certain distances with redoubts and places of arms; or the besiegers contented themselves in surrounding it with a deep ditch and intrenchment, well pallisaded, to prevent the garrison from making sorties, or any succour or provisions from being introduced by the adversary without. In this situation the investing army tranquilly waited until famine brought about what at that period art and force were unable to accomplish. From hence proceeds the extreme length of those sieges chiefly spoken of in the more early pages of profane history; that of Troy, which lasted ten years; that of Azotus, by Psammetichus, which continued twenty-nine; and that of Babylon, by Cyrus, who, according to Xenophon (Cyrop.), would have been much longer detained before its walls, if a lucky surprize had not rendered him master of the place. See Babylon.

The ancient Greeks, on foreseeing that the siege of a fortress would prove a work of time, often changed it into a blockade. They environed the town with a fosse and rampart against the attempts of the garrison, and drew another ditch round it towards the country, to oppose such troops as might advance to succour the place. The besiegers established their camp between the two lines, and thus, in process of time, starved their adversaries into a capitulation.

In the instance of the blockade of Platæa, carried on during the third year of the Peloponnesian war, the works constructed by the Lacedæmonians were of a more complex nature. They consisted in two walls of solid masonry, built at the distance of sixteen feet from each other, of a reasonable thickness, and covered in at top by a kind of roof or platform. The intervening space formed a suite of apartments, in which the troops, destined to carry on the blockade, were lodged during the winter. Each of these walls was furnished with a parapet and battlements, and, at the distance of every ten of these last, was erected a turret with a flat roof, of the breadth of the whole terrace, and capable of making resistance at the same time against an enemy from within or without. The only method of communication between the different chambers, was by traversing these towers.

The approach to the walls on either side was defended by a deep ditch, the earth of which had been used in constructing the rampart. During the night, guards were kept on the several towers; centinels were established at different posts round the whole extent of the circumvallation; and a corps de reserve of three hundred men remained always under arms, ready to march on the first signal wherever there might be occasion for their services.

This is the most remarkable instance of a blockade we meet with in the Grecian history. Notwithstanding, however, all the precautions above related, and the seeming impracticability of flight, the intrepid garrison of Platæa, found means to elude the vigilance of their besiegers, and by a well concerted sortie, about one half of them effected an escape across the formidable works of the Peloponnesians, and reached Athens in safety. The event is related in a very interesting and circumstantial manner by Thucydides in his second book. The Romans first imitated, and finally surpassed the Greeks in this as well as in every other branch of scientific warfare. As early as the siege of Agrigentum, in the first Punic war, we find them dividing their forces, and forming two encampments to block up the place on both sides; connecting these encampments by lines of circumvallation, and braving within these defences every effort made to relieve the town by the enemy from without. But these lines were equally badly guarded against a sortie with those of Platæa. The Carthaginian garrison, imitating the former example, succeeded in a like manner in forcing a passage by night over the intrenchments of the besiegers. (Polyb. lib. i. c. 17.) The famous blockade of Lilybæum, during the same war, which lasted for nearly ten years, is a remarkable instance of Roman perseverance in military undertakings, although, the place being open to receiving supplies from the sea, the assiduity of the besiegers was not attended with such complete success as it deserved. By degrees, however, the Romans improved in the art of reducing fortresses by blockade. Syracuse, which the abilities of Archimedes rendered impregnable by open force, had been thus reduced by Marcellus, but for the treachery of a townsman, which in a great measure abridged his labour; and all the military science and manœuvre of the formidable Hannibal was in vain exerted for the preservation of Capua, during the twelve months the siege lasted. (Polyb. Livy.)

The works constructed by Scipio Æmilianus for the reduction of Numantia, exceeded in magnitude all which had been raised on any former occasion, and besides surpassing them in strength, embraced a much greater extent of ground, than the intrenchments of the Lacedæmonians before Platæa. Numantia was eighty-four stadia, or nearly a league in circuit. Scipio, after having invested it, drew a circle inclosing twice the area of the circumference of the town; and this work being compleated, he threw up his lines of circumvallation and contravallation at a reasonable distance from each other. Each of these fortifications was composed of a rampart eight feet thick, and ten in height, defended by sharp pallisades, and flanked with turrets at a hundred feet distant from each other. We can hardly comprehend or credit the immense labour of such a circumvallation; but nothing can be better attested than these facts. (Appian. de Bell. Hisp.)

Among the numerous exploits of Cornelius Sylla, the blockade of Præneste, during his civil war with the party of Marius in Italy, is not to be reckoned the least. The inflexible assiduity, with which it was kept up during a long period of time, and preserved unbroken against the bloody and almost unintermitted attacks of several hostile armies, superior in number to his own, conveys the highest idea of

his martial abilities. It was, however, under the auſpices of Julius Cæſar, that this branch of military ſcience attained its higheſt point of perfection among the Romans; and whether we conſult the annals of ancient or modern warfare, we find no example to equal the talents diſplayed by that unrivalled general, in the formation of his immenſe works before Aleſia and at Dyrrhachium, which have deſervedly excited the wonder and admiration of poſterity.

In the former inſtance, he undertook the arduous taſk of blocking up an army of 80,000 Gauls, doubly ſuperior in number to his own forces; commanded by a general of the greateſt military knowledge, Vercingetorix, and entrenched under the walls of a fortified city, ſituated itſelf on an almoſt inacceſſible mountain. Cæſar's line of contravallation, extending nearly eleven miles, was compoſed of a ditch fifteen feet broad, and as many deep, defended by a rampart twelve feet in height, furniſhed with a parapet, and fortified all round by turrets, at the regular diſtance of eighty feet. The front of the rampart, looking towards the town, was protected by a palliſade of ſharp ſtakes and boughs of trees, interlaced, cut ſharp, and pointing outwards. Before the foſſe were planted five different rows of *cippi*, or large branches ſharpened at the ends, fixed in trenches five feet in depth, and ſo ſtrongly interwoven, as not to be removed or plucked up, without infinite labourr. In front of theſe were arranged eight other rows of *lilia*, or pits, three feet deep, diſpoſed in the form of a quincunx, ſtuck thick with ſtrong ſharp ſtakes, and covered over with buſhes to deceive the enemy. Before theſe again were ſcattered up and down numerous ſtakes of a foot in length, faſtened in the earth, and headed with barbed iron hooks, called by the Romans *ſtimuli*. Farther advanced than theſe laſt, at 400 paces diſtance from the rampart, Cæſar drew another ditch, twenty feet broad and deep, to keep the garriſon at a diſtance, and prevent them from annoying his ſoldiers while employed on the contravallation. Not contented with ſuch immenſe labours, he conſtructed the like fortifications towards the country, for the purpoſe of fruſtrating any attempts the expected Gauliſh ſuccours might make for the relief of their beſieged countrymen. Between the lines, a ſpace of nearly half a mile in breadth, was diſpoſed the inveſting army, and their principal encampment was pitched in the moſt convenient ſituation for communicating with every part of the circumvallation. Behind theſe defences did Cæſar baffle the utmoſt efforts of a new army of 250,000 Gauls, ſent to extricate Vercingetorix; and, after a ſeries of the moſt brilliant atchievements ever recorded, obliged the town of Aleſia, and the army incloſed within its walls, to ſurrender at diſcretion. Cæſ. de Bel. Gal. lib. vii.

No leſs famous in hiſtory, though not productive of equal ſucceſs, were the celebrated lines at Dyrrhachium, carried over a tract of fifteen miles, and within which, Cæſar flattered himſelf, to ſurround, and compel to a capitulation, an army exceeding his own in ſtrength, and commanded by the great Pompey. But in this inſtance the conqueror of Gaul had to do with Romans, and the enterprize proved too vaſt for his ſtrength. Pompey, by a ſudden and well-directed effort, broke through the blockade, when it was on the very point of being completed; and had he briſkly followed up the advantage, might, according to Cæſar's own confeſſion, have converted his adverſaries' hopes of ſucceſs into total defeat. Cæſ. de Bel. Civ. lib. iii.

The works thrown up by Auguſtus at Peruſia, and the entrenchments within, which Stilico at Fœſula encloſed, and deſtroyed an inundation of 400,000 Goths, are proofs that in after ages the Romans retained a remembrance of the means by which Cæſar had triumphed at Aleſia, and were ſtill capable of practiſing them for the extermination of their numerous enemies. App. de Bel. Civ. Zozim. Proſp. Marc. Chron.

In modern warfare, there are two ways of forming blockades. The firſt, and moſt ſimple, conſiſts in fortifying and occupying different poſitions at a ſmall diſtance from the place, principally upon all the highways and avenues, and along the banks of rivers, both above and below the town. Theſe poſts are guarded by diſtinct corps of infantry and cavalry, who take care to keep up an eaſy communication with one another, and to prevent all ſupplies of proviſions from being conveyed into the fortreſs blockaded. This, by degrees, reduces the garriſon to great neceſſity, cauſes them to deſert, and frequently occaſions ſuch murmurings and mutinies among the inhabitants, as to force the governor to a premature capitulation. Such a ſpecies of blockade is extremely tedious; for it is almoſt impoſſible to prevent proviſions from being ſometimes introduced in ſmall quantities, and reviving the courage and patience of the beſieged. But it is of advantage, after having thus for ſome time inveſted a town at a diſtance, to convert the operations into a regular ſiege, as the garriſon are then generally unprovided with the materials neceſſary for protracting their defence.

The ſecond kind of blockade is much cloſer and nearer. It is effected by means of lines of circumvallation and contravallation, between which the army lies encamped, and is adopted only in particular caſes. If, for example, after the loſs of a battle, the enemy ſhould retire into a town which is well known not to be over-abundantly ſupplied with proviſions, and, it is preſumed, muſt be obliged to ſurrender in a few days. But as it would be the height of imprudence in a beaten general to expoſe the remains of his army to certain ruin, by ſhutting them up in a place ſo ill-circumſtanced, (a fault, nevertheleſs, committed by marſhal Wurmſer in 1796, after the loſs of the battles of Baſſano and Roveredo, and which all the importance attached by the imperialiſts to the preſervation of Mantua can hardly excuſe,) this kind of blockade is ſeldom put in practice.

It is rarely a fortreſs is reduced to ſurrender, by the mere proceſs of blockading; but ſieges are often greatly accelerated by it, on account of that ſcarcity of neceſſaries, whether for the ſubſiſtence or defence of the garriſon, which, in a greater or leſs degree, is its never failing conſequence.

The blocking up of towns by corps principally of cavalry, poſted in the neighbouring places of ſtrength, is more convenient than any other method; becauſe the troops forming the inveſtiture, are not ſo fatigued as they would be in occupying open poſitions, and unfortified villages. In the latter caſe, it is neceſſary to be always on the alert, not only againſt the garriſon, who, by a well directed ſortie, may interrupt the communication, and cut off ſome of the detachments; but, againſt the enemy from without, who, by ſecretly marching a ſtrong force, may ſurpriſe, beat up one of the beſieger's quarters, and introduce a convoy, or reinforcement into the town. On account of theſe inconveniences, it is eſſentially neceſſary to aſcertain the quantity of proviſions and ſtores contained in the magazines of a place blockaded, in order to compute how long it may hold out, and to have an army in the field ſufficiently ſtrong to protect and cover the blockade. For, ſhould the enemy ſucceed in ſurpriſing and cutting off one detachment, its defeat might occaſion the ſucceſſive deſtruction, or capture of all the others, before they could aſſemble in competent force to repulſe the collected attacks of an enterprizing and vigorous adverſary. (Feuquieres, Mem. chap lxxxii. p. 377.)

It is chiefly, ſince the conteſt for the imperial ſucceſſion

in 1740, that the expedient of blockading fortreſſes of the moſt formidable ſtrength, has been preferred to the leſs tedious, but more deſtructive plan of carrying them by a regular ſiege. In the latter caſe, every outwork belonging to the place muſt be taken, or battered down inch by inch, with an immenſe loſs to the beſieging army, and frequently at the hazard of its being ſo reduced in numbers, as not to be capable of undertaking any action of moment during the remainder of the campaign. On the other hand a blockade, well kept up, muſt, ſooner or later, reduce the garriſon to the laſt extremity for want of proviſions, or ammunition. The number of troops engaged in the enterprize is comparatively ſmall. The loſs of men, neceſſarily conſiderable in the frequent and bloody attacks on the fortifications of a well defended place, is entirely avoided; and the major part of an army is ſtill at liberty to continue its advances into the heart of the enemy's country, and to follow up a previous ſucceſs, without the tedious proceſs of ſtopping to reduce every ſtrong hold in its way. The inconveniences which might otherwiſe reſult from leaving a hoſtile garriſon in the rear, are, in a great meaſure, obviated, if the blockade is kept up with proper alacrity and cloſeneſs. The enemy within the town have enough to do to attend to procuring proviſions for themſelves, without troubling the convoys deſtined for the main army of their beſiegers; and by this means, the operations of a campaign, ſo far from being retarded, are frequently accelerated, by having recourſe to a blockade. Had the allied powers, inſtead of mouldering away their armies before the walls of Mayence and Valenciennes, and afterwards completing their ruin, by the impotent and bloody attempts upon Dunkirk and Maubeuge, adopted this method during the ſummer of the year 1793, they poſſibly might have made greater impreſſion on the territory of the French republic. Had, on the contrary, the generals Jourdan and Pichegru endeavoured, in 1794, to carry Landrecy, Valenciennes, Condé, and Luxembourg, by regular ſieges, inſtead of contenting themſelves with leaving thoſe fortreſſes in a ſtate of blockade, it is very evident that the ſucceſſes of the French, during the latter part of that memorable campaign, would have been by no means ſo rapid and important as they actually turned out.

When the directory formed, in 1796, the reſolution of invading Germany, their armies made no attempt to attack in front the towns of Manheim, or Mayence, but proceeded to effect a paſſage over the Rhine, at a diſtance from thoſe places; and, inſtead of conſuming their time, and waſting their ſtrength in long and tedious ſieges, they advanced rapidly into Suabia and Franconia. They wiſhed to become maſters of Ehrenbreitſtein, Mayence, Manheim, and Philipſburg, by the ſame method by which, in 1794, they had recovered the towns of Landrecy, Queſnoy, Valenciennes, and Condé, and to atchieve, by a ſingle manœuvre, that which would, in former times, have been the reſult of two or three ſucceſſive campaigns. Purſuant to this ſyſtem, they forbore to undertake any ſiege, and ventured to leave fortified places at a great diſtance behind them. Their generals foreſaw, that by carrying the war away from theſe towns, they ſhould, by force, detach the enemy from them; and judged that if they could obtain and keep poſſeſſion of the country ſituated beyond theſe fortreſſes, they would, in the end, fall into their hands perfectly undamaged, and without having coſt them either blood or treaſure. They propoſed to acquire the fortified places, by making themſelves maſters of the ſurrounding country; as formerly theſe countries were ſecured by getting poſſeſſion of the fortified places. Theſe had hitherto been the means of conqueſt; they now meant to make them its reſult. This method, by which the French acquired ſo great a number of fortified towns in 1794, met not with the ſame ſucceſs in 1796; but their failure did not ariſe from the ſtrong places which they left behind them; and as theſe had not impeded the progreſs of Jourdan and Moreau, neither were they the cauſes of their firſt diſaſters. If the troops of the republic had been victorious at Amberg, or at Wurtzburg, the fortreſſes of Ehrenbreitſtein, Manheim, Mayence, and Philipſburg, would, no doubt, have ultimately fallen, as Luxembourg did in 1795. Hiſt. of the Camp. of 1796, Lond. 1796, 8vo.

As a proof of the little danger attending this method of carrying on war, we ſhall only add, that the garriſons of Philipſburg and Mayence remained ſo cloſely blockaded by a ſmall part of the French forces, as not to be capable of affording the archduke any eſſential aſſiſtance in cutting off the retreat of the invaders, notwithſtanding the rapid and diſorderly manner in which more particularly that of Jourdan was conducted. During the ſame year, Buonaparte, although the reduction of Mantua was the principal object of the campaign in Italy, did not for a moment diſcontinue his other operations in the field. On the contrary, this did not hinder him from carrying his arms into the middle ſtates of that beautiful country; from laying Parma and Modena under contribution; obliging the pope and duke of Tuſcany to agree to a neutrality; forcing the Engliſh from Leghorn, and fighting the imperialiſts almoſt inceſſantly, on every point of a very extended line, to the deſtruction of no leſs than four of their armies ſucceſſively detached againſt him.

Notwithſtanding the tardy proceedings of a blockade are far from being congenial to French vivacity, yet, where the ſtrength, or peculiarly inacceſſible ſituation of a fortreſs, have precluded all hopes of ſucceſs from a coup de main, they have often had recourſe to this means. That they are poſſeſſed of ſufficient preſeverance on theſe occaſions, the three blockades of Luxembourg, Mantua, and Ehrenbreitſtein, in 1795, 1796, aud 1798, are convincing proofs.

The moſt famous blockades which, during the laſt century, have diſtinguiſhed the military hiſtory of Europe, are the following: That of Prague by the Auſtrians in 1742, is renowned for the gallant defence made by the French forces under the marſhals Belliſle and Broglio, for the ſpace of five months, during which time they were driven to the laſt neceſſity for want of proviſions; and for the daring retreat by which the former of theſe generals preſerved the remains of his army from falling into the hands of the enemy. The late war has produced ſeveral remarkable inſtances. The two already mentioned of Luxembourg and Ehrenbreitſtein reflect equal honour on the beſiegers, whom no obſtacle could deter from continuing, with invincible patience, their plan of reduction; and the garriſons, whoſe reſiſtance was in the higheſt degree meritorious.

In 1796, public attention was every where engroſſed by the blockade of Mantua, which gave occaſion for the utmoſt exertion of that military talent by which the firſt conſul of France has ſo eminently diſtinguiſhed himſelf, and for the veteran marſhal Wurmſer to add freſh laurels to thoſe he had already acquired, and draw even from his conqueror a flattering acknowledgement of the ability he had diſplayed in its defence. The different exploits of theſe generals; the entire deſtruction of four imperial armies, in vain attempts to relieve the place; the bloody battles of Caſtiglione, Roveredo, Arcole, and Rivoli, the reſult of thoſe attempts; and the conqueſt of all Italy by the French,

French, the consequence of its fall, secures to the blockade of Mantua everlasting fame.

The conduct of general Massena, when blocked up in 1800 within the walls of Genoa, may justly be compared with the most glorious actions of the war. Surrounded on all sides by enemies; cut off from every hope of succour by land or sea, and almost destitute of provisions or ammunition, he maintained, for sixty days, a post the Austrians had flattered themselves to reduce by famine in six; destroyed immense numbers of them in his different attacks on their posts; and having defended the place to the last extremity, obtained a negociation (for Massena would not suffer the word capitulation to be inserted in the treaty), equally honourable to himself, and advantageous to his country. It was advantageous, inasmuch as it obliged the enemy to divide and scatter their forces, entangle themselves among the defiles of the Apennines, and, besides losing a number of men before Genoa, drew them to such a distance from what the French government intended to make the principal seat of action during the campaign, as enabled the first consul to pass the great St. Bernard unopposed, occupy the plains of Piedmont, throw himself in the rear of general Melas, and, by the battle of Marengo, extinguish at once the hopes of the Austrians in Italy.

BLOCK-*battery*, in the *Military Art*, denotes a wooden battery on four wheels, moveable from place to place, whereby to fire *en barbe*, or over the parapet; sometimes also used in galleries and casemates, where room is wanted.

Block-*brush*, a term used in *Heraldry*, to express a bundle or bunch of knee-holm, or bastard myrtle, formerly used by butchers to clean the surface of their chopping-blocks, which forms a part of the armorial ensigns assigned to the company of butchers of London.

Block-*carriage*, in the *Artillery*, denotes a carriage used for conveying mortars and their beds from one place to another.

Block-*house*, in the *Military Art*, a kind of wooden fort or battery, either mounted on rollers, or on a vessel, and serving either on the water, or in some counter-scarps and counter-approaches. The name is sometimes also given to a brick or stone fort, built on a bridge, or the brink of a river, serving not only for its defence, but for the command of the river, both above and below. Such was that noted *block-house* anciently on the bridge of Dresden, since demolished on enlarging the bridge.

Block-*printing*. See Printing.

BLOCKING, in *Middle Age Writers*, denotes a kind of burial used for persons dying excommunicated.

Blockings, *circular*, in *Architecture*, are bases to the dome, represented in the *Plate* of *Archit.* (title *Basilic*) QQQ; which, by their apparent solidity, seem to strengthen the dome, and at the same time taking from its height, add a peculiar gracefulness to its appearance.

Blockings, *square*, are represented at S (title *Basilic*), in *Plate* of *Archit.* These, when enriched with base and cap, obtain the appellation of pedestals.

Blocking-*course*. See Course.

BLOCKLAND, Anthony de Montfort, in *Biography*, a painter of history and portrait, was born of a noble family at Montfort, in 1532, and acquired his art in the school of Francis Floris, whose manner he always followed. By endeavouring principally to imitate the taste of the Roman school in design and composition, he became a distinguished artist. He well understood the principles of perspective, and he disposed his figures with judgment and accuracy. The style of his colouring was agreeable, and his pencil mellow. He designed every object after nature, and gave to the contours of his figures considerable elegance. His genius was best adapted to grand compositions, of which he designed many, both at Delft and Utrecht. Several of his works, particularly a Venus, and the history of Joseph and his brethren, are in so good a taste, that they seem to have been painted by a master educated in the school of Florence. Pilkington.

BLOCKLEY, in *Geography*, a township in Philadelphia, in the county of Pennsylvania.

BLOCKY, among *Jewellers*, a name given to a diamond when its sides are too upright, by its table and collet being larger than they ought to be.

BLOEMAERT, Abraham, in *Biography*, the most distinguished of a family of Dutch artists, was the son of Cornelius, an architect, engineer, and excellent statuary of Dordrecht, who, during the troubles of the Low Countries, removed to Utrecht. He was born at Gorcum in 1567; and resided chiefly at Utrecht, where he probably died, A.D. 1647. In his youth, he diligently copied the designs of Francis Floris; but the excellence to which he attained was chiefly owing to his own genius, which enabled him to acquire a style of painting peculiar to himself. He painted history pieces, sacred and profane, landscapes, and animals; but though he possessed a facility of invention, and a free-spirited touch, and well understood the chiaro-scuro, his taste and style are said to have too much of the Flemish, and he is charged with having indulged his own fancy, and deviating from nature in his figures. The historical picture of the death of Niobe and her children, gained him great reputation; the figures in the composition being as large as life. Some slight, masterly etchings are attributed to this artist, which are executed in a manner imitating drawings with a pen, from his own compositions. He also published some spirited chiaro-scuros, the outlines of which, contrary to the usual custom, were not cut on blocks of wood, but etched upon copper. Of this kind are two large prints by him, representing Moses and Aaron, both sitting figures. He left four sons, all artists. His son *Frederic* worked chiefly from his father's designs, and imitated his style in his etchings and chiaro-scuros. He also, conjointly with his father, made a large drawing book, consisting of figures, animals, landscapes, &c. *Henry* and *Adrian*, were both painters; and they are also mentioned as engravers: the most eminent, as a painter, was the latter.

Cornelius, the most distinguished as an engraver, was Abraham's youngest son, and born at Utrecht, in 1603. Devoting himself wholly to the art of engraving, he first studied under Crispin de Pass, and then went to Rome, where he died, at a very advanced age. The manner of engraving adopted by this artist was original, and the source of that style, in which the best French masters excelled, or those of them who worked merely with the graver. He covered the lights upon his distances, and the other parts of his plates which required tinting, with great care: whereas, before his time, the lights on the distant hills, trees, buildings, or figures, had been left quite clear; and by so many white spots, scattered in various parts of the same design, the harmony was destroyed, the subject confused, and the principal figures prevented from relieving with any striking effect. By this judicious improvement, Bloemaert gave to his prints a more clear and finished appearance, than all the laboured neatness even of Jerom Wierix had been able to produce. He drew correctly; but as he executed entirely with the graver, the extremities of his figures are heavy; and his heads are not always beautiful or expressive. In the mechanical part of the work few have excelled him,

either as to clearness, or freedom of execution. His great fault, however, is want of variety. The naked parts of his figures, the draperies, and the back ground, are equally neat, and engraven precisely in the same manner. Hence the effect is flat, and the flesh, for want of distinction, appears cold and silvery.

His works, which are numerous, are justly held in high estimation, and cannot be easily procured. The following are particularly noticed, and the first impressions of some of them are very rare: the "Chastity of Joseph," from Blanchart; the "Adoration of the Shepherds," from Raphael; the same subject from Pietro de Cortona; the "Holy Family" of the "Spectacles," as it is called, from Joseph's holding a pair of spectacles in his hand, from Annibale Caracci; another "Holy Family," from Parmegiano; the "Virgin and Child," the child sleeping, from Guido; "St. Luke painting the Virgin and Child," from Raphael; "St. Peter raising Tabitha from the Dead," from Guercino; "St. Marguerita" leaning on a pedestal, and setting her foot upon the dragon, after Annibale Caracci; the "Four Fathers of the Church," from his father A. Bloemaert; "Christ appearing to St. Ignatius," from the same; "Meleager presenting the boar's head to Atalanta," from Rubens; several "prints for a missal," after Ciro Ferri and others; a set of small prints of "Rustics, &c." from his father; "Heads" from the same; &c. &c. Pilkington and Strutt.

BLOEMEN, John Francis Van, a painter of landscapes, called by the Italians, from the delicate manner in which he painted his distances, "Horizonti," or "Orizonti," was born at Antwerp in 1656; and as he studied at Rome, and always resided in some part of Italy, he is generally considered as an Italian artist. His works have been very much admired in every part of Italy, and bought at very high prices by the best judges. His first manner resembled that of Vander Cable; but he afterwards made nature his model, and more particularly the views about Tivoli, the subjects of many of his landscapes, in which he represents, with extraordinary truth and beauty, the mists arising from the agitated surface of the river below. His pictures are generally well designed, and well handled; and those of his best time are now considered as an ornament to the most select cabinets in Europe. A very capital picture of this excellent artist, in which the figures were inserted by Sebastian Conca, is in the collection of the earl of Moira. By this artist we have five small etchings, probably done for his amusement. They are "perspective views," apparently near Rome. Pilkington and Strutt.

Bloemen, Peter Van, brother of the preceding, was born at Antwerp, and after living several years with his brother at Rome, and studying the works of the greatest masters, returned to his native city, where, in 1699, he was appointed director of the academy. The subjects of his pictures are the marchings of squadrons of cavalry, encampments, artillery, battles, Italian fairs, markets, and festivals, in which he manifests correctness of design and drawing, and an elegance in the manner of dressing his figures. His horses are designed in an admirable style, and in his battles they exhibit great spirit, graceful attitudes, and an expression full of life and nature. His landscapes are enriched with elegant architecture, with bassorelievos, and mutilated statues, in a noble taste; and they are rendered the more agreeable by a good tone of colour, animals of different kinds, and excellent figures. His best works are admired in all parts of Europe, and afford high prices; but some of them are too laboured, and less valuable. Pilkington.

Bloemen, Norbert Van, brother of the preceding, was born at Antwerp in 1672, and being allured by the reputation of his brothers to visit Italy, he there devoted all his hours to study. He principally painted conversations and portraits; but the colouring of his pictures is too glaring, and wants more truth and nature. Pilkington.

BLOIS, in *Geography*, lat. *Blesæ*, a city of France, was, before the revolution, the capital of "Le Blaisois," the see of a bishop, suffragan to the archbishop of Paris, and formerly the residence of the kings of France; but is now the capital of the department of the Loir and Cher, and divided into east and west Blois, the former containing 5400 inhabitants, and its canton 12,885, and the latter 7912, and its canton 11,862: the whole territory comprehends 237½ kiliometres, and each canton has eight communes. Blois is seated in a pleasant country, on a small eminence near the river Loir, over which is a handsome stone bridge. The castle is the principal ornament of the city, and has, on the first view, the appearance of two distinct buildings, which are joined by a passage cut out of a rock. That part of the castle, which was built by the duke of Orleans, instead of that which he demolished in 1632, is a superb, but unfinished edifice. The court before it, where the church of St. Saviour is situated, is very large, and was formerly used for tournaments. The adjoining gardens are magnificent and beautiful. On every gate of the city is exhibited an image of the Virgin Mary, who is thought to have delivered the inhabitants from the plague in 1631. In this castle, famous as the birth-place of Louis XII., are shewn the chambers where the duke of Guise, and his brother the cardinal, were murdered by order of Henry III., December 23, 1587. The church of St. Solenne is the cathedral, which is a beautiful structure. The front of the Jesuits' college is decorated with the Doric, Ionic, and Corinthian orders of architecture. About three quarters of a mile from the city, water in great abundance descends through the clefts of a rock, in a large aqueduct, by which it is conveyed to a reservoir near the walls, and it is then distributed by leaden pipes to the several parts of the city. The trade of Blois consists chiefly of wine and brandy; though it has manufactures of serges and ticken. Several kings have kept their courts at Blois, and the French language is spoken in the greatest perfection by its inhabitants. N. lat. 47° 35′ 20″. E. long. 1° 20′ 10″.

Blois, Peter *of*, *Petrus Blesensis*, in *Biography*, an eminent writer of the 12th century, was born about the year 1120 at Blois in France, whence he derived his name; and as his parents were opulent, he enjoyed all the necessary means of a learned education. In his youth he studied in the university of Paris, where he manifested a strong inclination to poetry, and in his more advanced life, he applied with peculiar ardour to the study of rhetoric. At Bononia, in Italy, whither he removed from Paris, he acquired eminence by his knowledge of the civil and canon-laws; and he appears also, by his writings, to have cultivated an acquaintance with medicine, and with various branches of the mathematics. But the principal object of his attention, and in which he is said to have particularly excelled, was theology, or the scholastic theology of the times, which consisted in vain attempts to prove and explain the numerous absurd opinions, which prevailed in the church, by the subtleties of Aristotelian logic. To him some have ascribed the first use of the term "transubstantiation," which was soon after adopted in the church of Rome. Being appointed preceptor to William II. king of Sicily, A.D. 1167, he obtained the custody of the privy-seal, and, next to the archbishop of Palermo, the prime minister, he had the greatest influence in all affairs. However, his power

power ſoon terminated; for, upon the baniſhment of the archbiſhop, A. D. 1168, he left the court of Sicily, and returned into France. From France he was invited into England, by Henry II. who employed him as his private ſecretary, made him archdeacon of Bath, and gave him ſome other benefices. After having ſpent a few years at court, he conceived a diſguſt at that mode of life, and retired into the family of Richard, archbiſhop of Canterbury, who made him his chancellor, about A. D. 1176. After the death of this prelate, A. D. 1183, he acted as ſecretary and chancellor to archbiſhop Baldwin, his ſucceſſor; and was deputed by him on an embaſſy to Rome, A. D. 1187, in order to plead his cauſe before pope Urban III. in the famous controverſy between him and the monks of Canterbury, about the church of Hackington. When Baldwin departed into the Holy Land, A. D. 1190, he was involved in various troubles in his old age, the cauſes of which are not diſtinctly known, and died about the end of the 12th century. From his works, which may be juſtly reckoned among the moſt valuable monuments of the age in which he flouriſhed, and ſome of which may even now be read with profit, he appears to have been a man of approved integrity and piety, as well as of a lively inventive genius, and uncommon erudition. He is ſaid to have dictated letters in Latin to three different ſcribes, on different ſubjects, and to have written a letter in the ſame language himſelf, at the ſame time. His printed works conſiſt of 183 letters, which he collected together at the deſire of Henry II.; of 65 ſermons, delivered on various occaſions; and of 17 tracts on different ſubjects; "Opera P. Bleſenſ. Paris, edit. A. D. 1667," fol.; and afterwards printed in the Bibliotheca Patrum, tom. 24. Cave Hiſt. Lit. vol. ii. p. 333. Henry's Hiſt. vol. vi. p. 147, &c.

BLOKZYL, in *Geography*, a town and fort of Overyſſel, ſituated at the mouth of the Steenwyk, or Old Aa, where it enters the Zuyder ſea, with a harbour capable of containing 200 veſſels; defended by ſix baſtions, and erected by the Dutch, at the commencement of their republic, to defend them from the invaſions of the Spaniards. N. lat. 52° 45′. E. long. 5° 45′.

BLOMARY, or Bloomary, the firſt forge in an iron-work, through which the metal paſſes after it is melted out of the ore. (See Iron.) They are alſo called *blomary-hearths*.

BLOMBERG, in *Geography*, a town of Germany, in the circle of Weſtphalia, and county of Lippe, which obtained its firſt privileges, in the beginning of the 14th century, from count Simon I.; 8 miles S. E. of Lemgow.

BLOMESHOLM, a manor of Sweden, in the diſtrict of Bohus, about 3 Swediſh miles from Stromſtadt, in which is a very ancient monument, conſiſting of large ſtones, ſet up perpendicularly, and arranged in the form of a ſhip.

BLONAI, a barony and caſtle of Swiſſerland, near Vevay, and about 1½ mile from the lake of Geneva.

BLOND, Le, Christopher, in *Biography*, a painter, was born in 1670, but little noticed in the more early part of his life. He became known at Rome in 1716, and eſtabliſhed his reputation in Italy, as a good painter of portrait in miniature. At Amſterdam he diſtinguiſhed himſelf by painting ſmall portraits, for bracelets, rings, and ſnuff-boxes, firſt in water colours, with a very lively and natural colouring, and afterwards in oil. From the Low Countries he came over to England, and projected a new manufactory for impreſſing colours on paper with copper-plates, which promiſed to be advantageous, but in the end proved detrimental to himſelf and his aſſociates, to which his own diſſolute life and manners very much contributed. His ſcheme was to copy the moſt capital pictures in England, of the greateſt maſters, ſo as to give his prints the appearance of paintings in oil. Many of his prints were well executed, are ſtill extant, and are held in eſtimation. It is ſaid, however, that he was not the original inventor of this method of managing colours; but that he took it from Laſtman, and others, who with equal capacities and more diſcreet conduct, had undertaken it before him, but failed of ſucceſs. Pilkington.

BLONDEL, David, a French proteſtant miniſter, eminent for his acquaintance with eccleſiaſtical and civil hiſtory, was a native of Chalons in Champagne, admitted miniſter in 1614, and ſettled at Houdan near Paris. His firſt work in favour of the Proteſtants was printed at Sedan in 1619, under the title of "Modeſte Declaration, &c." or, "A Modeſt Declaration of the ſincerity and truth of the reformed churches in France:" and intended as a reply to the invectives of the party of the biſhop of Luçon, afterwards cardinal Richelieu. This work eſtabliſhed his reputation among the Proteſtants, and occaſioned his being much employed n their ſynods. He was not diſtinguiſhed as a preacher; and his ſtyle, as a writer, was perplexed, and incumbered with parentheſes; but his judgment was penetrating, his memory tenacious, and his erudition extenſive. As an honorary profeſſor, with a penſion, to which office he was appointed by the ſynod of Charenton in 1645, he had opportunity to devote his time to literature; but though he undertook to refute Baronius's annals, it does not appear that he did much beſides writing a few notes in his own copy of the work. His works were "Explications on the Euchariſt;" a treatiſe concerning "The Primacy of the church;" "Pſeudo-Iſidorus et Turrianus vapulantes," againſt the Decretal epiſtles; a "Treatiſe on the Sibyls," diſproving the truth of their oracles, and refuting the ancient practice of praying for the dead; and a treatiſe "De Epiſcopis et Preſbyteris." By his treatiſe againſt the ſtory of pope Joan, which he rejected as fabulous, he offended ſome Proteſtants, who did not wiſh to be deprived of this topic of ſatire againſt the Romiſh church. Among Blondel's works on civil hiſtory, we may reckon his "Genealogy of the kings of France againſt Chifflet," written in Latin, and printed at Amſterdam in 1654, 2 vols. fol. which is ſaid to have been undertaken at the deſire of chancellor Seguier; and his piece "De formula regnante Chriſto." On the death of Gerard Voſſius, he was choſen to ſucceed him as profeſſor of hiſtory in the ſchola illuſtris of Amſterdam, and took poſſeſſion of his office in 1650; but his aſſiduity in the proſecution of his ſtudies and change of air, occaſioned the loſs of his ſight, after which, it is ſaid, that he dictated his work intitled "Genealogy, &c." At Amſterdam his ſituation was rendered uneaſy by a charge of Arminianiſm; and he died in 1655. Gen. Dict.

Blondel, Francis, an eminent mathematician and military engineer, was born in 1617, at Ribemont in Picardy. In 1652, he was travelling governor to the young count of Brienne, and after a tour of three years he publiſhed an account of it in Latin. After his return he was advanced to conſiderable poſts both in the army and navy, and he was employed in various negotiations with foreign princes. In 1659, being deputed by Louis XIV. as his envoy-extraordinary to Conſtantinople, he viſited Egypt; and at the termination of his embaſſy, he was appointed counſellor of ſtate, tutor in mathematics and belles-lettres to the dauphin, and one of the mathematical profeſſors at the royal college. In 1665, he began to diſplay his talents for architecture, when the court employed him to conſtruct a bridge over the Charente at the town of Saintes. In 1669, he became member of the Academy of Sciences; and in 1670 he was honoured

honoured with letters patent from the king for the superintendence of all the public works in Paris. To him were intrusted the repair and decorations of the gates of St. Antony and St. Bernard; and the gate of St. Denis, one of the most finished pieces of French architecture, was designed and erected by himself. In the office of director and professor of the Academy of Architecture, established in 1671, he gave "A Course of Architecture," which was published in large folio, in 1698, and which was long considered as a standard book. In 1675, he presented to the king his treatises "On the art of throwing bombs," printed in 1685, 4to. and "On a new method of fortification," which procured for him the rank of marshal de camp. His other works were "Notes on the architecture of Savot;" the "Resolution of four principal problems of architecture," Paris, 1676, fol.; "A Course of mathematics," Paris, 1683, 4to.; the "History of the Roman calendar," Paris, 1682, 4to.; and a "Comparison between Pindar and Horace." He also communicated several ingenious pieces to the Royal Academy of Sciences, which are inserted in their Memoires, particularly for the year 1666. He died at Paris, Feb. 1. 1686. Gen Dict.

Blondel, Francis, was admitted doctor in medicine at Paris, the place of his birth, in 1632. As he had acquired considerable reputation as a scholar, he was engaged, on the death of Chartier, to assist in completing his magnificent edition of the works of Hippocrates and Galen, three volumes of which were left unfinished. He was an avowed opponent to the admission of antimony, and of all chemical preparations, into the practice of medicine, coinciding in that respect with his cotemporary and coadjutor, Guy Patin. In 1658, he was made dean of the faculty of medicine, which office he held the following year. In 1660, he published "Statuta facultatis medicinæ," Paris, 12mo.; and in 1665, an epistle to Alliot, "De cura carcinomatis, absque ferro et igne," 4to. Alliot used for the purpose a medicine prepared from the arsenicum rubrum, dissolved in aqua fortis, and precipitated with the acetum saturni. The precipitate was then washed by repeated affusions of warm water, and its causticity further mitigated by burning spirits of wine, in which it was immersed, until the powder became perfectly insipid. Blondel died Sept. 5th, 1682. Haller. Bib. Chirurg. et Med. Eloy Dict. Hist.

Blondel, Francis, born at Liege in 1613, studied medicine at Cologne, and was for some time physician to the elector of Treves. On the death of that prince, in 1652, he went to Aix, and was appointed physician and superintendant of the baths in that city. In 1662, he published "Lettre de Francis Blondel a Jaques Didier, touchant les eaux minerales chaudes d'Aix, et de Borset, et les cures qui se sont faites par son usage," Brux. 12mo.; and in 1671, "Thermarum aquisgranensium, et porcetanarum descriptio," which was reprinted in 1688, in 4to. with engravings, and considerable additions. He died in 1703, much regretted by the inhabitants of Aix, having, by his writings, so recommended the waters, as considerably to increase the resort of patients there. Eloy. Dict. Hist.

Blondel, James Augustus, of a French family, but born in England, and admitted licentiate of the college of physicians in London, about the year 1720; published, in 1727, "The strength of imagination in pregnant women examined, and the opinion that marks and deformities in children arise from thence, demonstrated to be a vulgar error," 12mo. Though Dr. B. had not put his name to this work, yet his neighbour and colleague Dr. Turner, discovering that he was the writer, and considering it as an attack upon what he had said on the subject, in the 12th chapter of his treatise on the diseases of the skin, in which he gives numerous instances of marks and deformities in the bodies of children, impressed on them by the disturbed imaginations of the parents, thought himself called upon to explain and to defend what he had there advanced. He therefore, in an appendix to his treatise on gleets, published the following year, gave some additional observations on the subject, in further proof of the influence of the affections of the mother over the fœtus in utero. To this Dr. Blondel replied, in 1729, and with much humour, as well as argument, shewed the absurdity and fallacy of the opinion maintained by his antagonist; who, if he insisted on his point, must admit that animals, and even plants, are under the influence of the same affections; their fœtusses being frequently produced equally defective and monstrous as those of the human species. The answer is entitled, "The power of the mother's imagination over the fœtus examined, in answer to Dr. Daniel Turner's book, entitled, 'A Defence of the 12th chapter of his treatise, de morbis cutaneis." This drew a more serious reply from Dr. Turner, addressed immediately to his opponent, under the title of "The force of the mother's imagination upon the fœtus in utero still farther considered, in the way of a reply to Dr. Blondel's last book, by, &c." 1730, 8vo. But though the doctor supports himself with the authority of Schenckius, Hildanus, Horstius, and many other collectors of wonderful and extraordinary stories, the good sense of his antagonist prevailed, and he has the merit of having contributed very largely towards removing the prejudices on this subject, which had prevailed for ages, and, with them, the solicitude and anxiety which never failed to torment the minds of such women as had the misfortune, while pregnant, to see or hear any thing, strongly affecting their imaginations, lest their offspring should be born with some defect or deformity. It is now pretty generally known, that no such consequences follow, and that the few cases in which children are produced defective, with redundant parts, or in any way distorted, happen indifferently, where the mother has or has not, in the course of her pregnancy, received some shock or alarm. The power of the imagination in marking, distorting, or deforming the fœtus in utero is vanished, with the witches, ghosts, and hobgoblins, formerly equally objects of distress and terror. Haller. Bib. Chir. et Med. Pract. Eloy. Dict. Hist.

There is another writer of the name mentioned by bibliographers.

Blondel, Jaques, surgeon of Lisle in Flanders. He translated the Chirurgia militaris of Nicolas Godin, under the title of "La Chirurgie militaire, tres utile a tous ceux qui veulent suivre un camp, en tems de guerre, pareillement a tous autres en condition pestilente ou dysenterique, ecrite en Latin, par Nic. Godin," Anvers, 1558, 8vo.

Blondel, John Francis, was born at Rouen in 1705; and was known, not only as architect to the king, member of the Academy of Architecture, and royal professor of the art at the Louvre, but by several useful publications; as "A Discourse on Architecture," 12mo.; "A Treatise on the decoration of buildings," 1738, 2 vols. 4to.; "A Course of Architecture," 6 vols. 8vo. 1771—1773. The two last were published in 1777, 3 years after his death. M. de Bastide also published, in 1774, a posthumous work of Blondel, entitled, "L'homme du monde eclairé, par les Arts," 8vo. 2 vols. Blondel was the author of the articles relating to architecture in the Encyclopedie. He died Jan. 9, 1774. Encycl.

BLONDIN, Peter, a native of Picardy, born Dec. 18th 1682, was a disciple of Tournefort, by whose advice he travelled over Picardy, Normandy, and the isle of France. to improve himself in botany. In the course of his excursion, he disco-

discovered upwards of an hundred and twenty plants, which had not been before described, and several others, which had been supposed peculiar to America. In 1708, he was admitted doctor in medicine at Rheims; and, in 1712, he was received into the French academy, in quality of eleve of M. Reneaume, an honour he did not long enjoy, being cut off in the following year, by an inflammation of the lungs. M. Fontenelle, who spoke his funeral eulogium, attributed to him a small work, published in his life-time, in which he had made some corrections in Tournefort's arrangement of certain species of plants; he also says, he left some curious memoirs on the subject of botany, intended for publication, and which were prevented being printed by his premature death. But his name does not appear in Haller's Bib. Botan. nor in the catalogue of botanical works contained in the splendid library of sir Joseph Banks, lately published by Dr. Dryander. Eloy Dict. Hist.

BLONDVAURY, in *Geography*, a town of France, in the department of the Charente, 5 leagues east of Confolens.

BLONDUS, or Biondi, Michael Angelo, in *Biography*, was born at Venice, May 4th 1497. After studying under Augustin Niphus, a celebrated teacher of that time, he settled at Naples. He was a voluminous writer. The titles of the most distinguished of his works follow. "Epitome ex libris Hippocratis de nova et prisca arte medendi deque diebus decretoriis," Romæ, 1528, 1545, 8vo.; "Libellus de morbis puerorum," Venetiis, 1539, 8vo.; "De partibus ictu sectis citissime sanandis, et medicamento aquæ, nuper invento. In plurimorum opinionem de origine morbi Gallici, deque ligni Indici ancipiti proprietate," Venetiis, 1542, 8vo. For wounds made with a cutting instrument, and recently inflicted, he recommends the application of simple water, as a most valuable and useful remedy. He does not admit that the venereal disease was a new complaint, originating in the West Indies, but believes it to have been known to Hippocrates, and other ancient physicians, and described in their writings. He had used the lignum sanctum in his attempts to cure the disease, but ineffectually; the disease returning, he says, after discontinuing the medicine, with increased violence. He placed his principal dependence on mercury, but does not give the rationale, or method of using it. This work is inserted by Conrad Gesner in his "Collectio scriptorum optimorum de chirurgia," 1555, fol. For the titles of the remainder of his works, see Eloy's Dict. Histor. Med. Astruc. de Morb. Vener. Haller. Bib. Med. Pract. et Botan.

BLONSK, in *Geography*, a district of Poland, belonging to the territory of Warsaw, in the palatinate of Czersk, or Masovia.

BLOOD, is the nutritive fluid of animals. In the human subject it circulates through the arteries and veins (see Circulation), being of a scarlet colour in the former, and of a purple colour in the latter; it is of considerable consistence; of a slightly saline taste, and peculiar smell; its specific gravity is estimated at 1.0527. When blood is drawn into a bason, it first congeals into a tremulous, jelly-like mass; and then spontaneously separates into a solid, heavier substance termed the crassamentum, cruor, or the clot of the blood, and a supernatant pale liquor called the serum. If the crassamentum of the blood be washed with water, all the red colour may be washed out of it, and a firm whitish substance will remain. This substance, which did exist in a state of subtile fluidity, so as to be capable of permeating the minute vessels of the body, and which thus spontaneously concretes, has been, therefore, called the coagulating lymph of the blood. If the blood be stirred with a wisp, this substance concretes in a fibrous form round about it, and it was in consequence formerly termed the fibrous part of the blood. By this latter denomination, it is also now generally known and described. Thus it appears, that there are three parts readily distinguishable in the blood; the serum; the fibrous part or basis of the crassamentum; and the colouring matter; to the more particular consideration of these we now proceed.

Of the Serum.

The Serum of the blood is of a light greenish yellow colour, and its mean specific gracity is estimated at 1.0287. If it be heated to about 160° of Fahrenheit's thermometer, the fluid serum becomes converted into a tremulous solid substance; which being cut in pieces and compressed, there can be squeezed out of it a muddy and somewhat glutinous fluid, which is termed the serosity of the blood. If the remainder be boiled, part of it will be found to be insoluble; and this has all the properties of albumen, or that insoluble matter which is contained in the white of the egg; for an account of which, see the article Albumen. That part of the serum which is dissolved in boiling water, becomes a jelly, if the water be evaporated to a certain degree, and it be suffered to become cold. It is again soluble, if more water be added. This modification of animal matter is now termed gelatine, and to that article the reader is referred for a more full account of its properties. The serosity of the blood appears to contain animal mucilage, but no accurate chemical examination has as yet been made of it. The serum of the blood turns the syrup of violets green; which effect is owing to soda, that is contained in it. If coagulated serum be heated in a silver vessel, the silver becomes blackened by being converted into a sulphuret; in consequence of the serum containing sulphur. If the salts of the serum be dissolved in boiling water, and afterwards crystallized, they are found to be carbonat of soda, muriat of soda, phosphate of soda, and phosphate of lime.

Of the fibrous Matter of the Blood.

This matter spontaneously concretes in open and in close vessels, in the temperature of the animal, or in a much lower degree of temperature, though with some little variation as to the time in which the coagulation happens. Dilution of albumen by water prevents its coagulation, even by those chemical agents which suddenly and firmly coagulate it in its natural state, such as heat, spirit, and acids. No dilution of the blood by water has hitherto prevented even the spontaneous coagulation of its fibrous part. The basis of the crassamentum, or fibrous part of the blood, is found to be a whitish solid elastic substance, of greater specific gravity than the serum. This substance, which is insoluble in water or alcohol, and which resembles the muscular fibres in its chemical properties, has been denominated by the French chemists fibrine, or fibrina, to which article the reader is referred for a more particular account of it. It is right however here to remark, that chemical analysis ultimately converts all animal substances into azot, hydrogen, and carbon; and that the proportion of the former is greater in the fibrous part of the blood than in albumen, or perhaps in any other animal compound.

Of the colouring Matter of the Blood.

The colouring matter of the blood has an attraction to water and dissolves in it, forming a transparent red liquor. This attraction is perceived in macerating flesh in water; for the colouring part, which is specifically heavier than any other part of the blood, and readily sinks in the serum, yet rises up and becomes dissolved in the water. The watery solution of this part of the blood turns the syrup of violets green, and contains both soda and albumen. If the red

part

part of the blood be incinerated by fire, it is found to contain much iron; which Fourcroy and Vauquelin discovered was combined with phosphoric acid in the state of subphosphate of iron; and this is the only part of the blood which is found in analysis to contain any of that metal. Fourcroy examined the blood of the fœtus, and found that the colouring matter was darker and more abundant than in the adult subject. He also found that the blood of the fœtus contained no fibrine, but much more gelatine than in the adult.

The colouring matter of the blood is found, by examination with the microscope, to be composed of very minute globular particles. They were particularly attended to by Leeuwenhoeck, and afterwards examined and described by others, chiefly by Senac, Hewson, and Fontana. They are so small as scarcely to admit of an accurate examination in this climate by the common microscope. This assertion will probably be readily admitted, if it be granted that they do not exceed a 200,000th part of an inch in diameter; yet such dimensions may be stated as the average estimate of their size, drawn from the accounts of various observers. Haller says, that he saw them as large as peas by the solar microscope, and it was by the aid of that instrument that we are enabled to give the following account of them. A drop of blood, much diluted with water, was put upon a micrometer or piece of glass, ruled by a diamond in squares of $\frac{1}{50}$th of an inch, and put before the lens of the solar microscope. The squares were magnified upon the screen to eight inches diameter. The globules of the blood were seen undulating to and fro in vast numbers; they all appeared exactly of the same size; and a few which were separated from the rest were attentively examined. These had all the appearance of globules; they were circular in their disk, and were regularly illumined on one side, and shaded on the other, with the prismatic colours arranged in the middle or greatest convexity; the violet being next to the light, and the red next to the shade. On varying the focal distance of the lens, indeed, an alteration of appearance took place, some shading appeared in the middle just in the manner represented by Fontana. Upon again varying the position of the lens, the globules appeared as at first. This shadowy appearance in the middle probably led Mr. Hewson to suppose that they contained a central solid particle. It is, however, generally admitted, that the colouring particles of the blood are spherical; and if their size be calculated from the preceding account, they will be found to be less in diameter than the 200,000th part of an inch.

If, for instance, the square of $\frac{1}{50}$th of an inch be magnified to a square of eight inches, and the globules appear $\frac{1}{8}$th of an inch in diameter, then 64 may be placed in a line on one side of the square, and $64 \times 64 = 4096$, is the number that will stand within that surface. Now, this square is but $\frac{1}{50}$th of an inch, magnified on the screen to a square of 8 inches; then, multiply 4096 by 50, and it gives 204,800, as the number of these globules which would stand in the square of one inch.

The preceding account of the blood, imperfect as it is, yet affords us much satisfactory information. We perceive that there are contained in the blood, in a state of subtile fluidity, the materials of which the body is constructed, and which are capable of becoming solid fibres of various degrees of solubility. We find in it also that aqueous liquor which fills all the interstices of the solid parts. It is true, that we find in the animal body many substances which do not exist formally in the blood, and which are new compounds of matter made out of that fluid; and for an account of which the reader is referred to glandular secretion.

With respect to that change which the animal matter undergoes from a fluid to a solid state, and which is called coagulation, but little is satisfactorily known. It seems to have been a problem amongst chemists. Scheele attributed it to the agency of caloric; Fourcroy, to that of oxygen; and Dr. Thomson has of late accounted for it, without supposing the addition of any other substance to the coagulated matter. With reference to the last opinion, it should be observed, that in coagulation, a change in the chemical properties of the coagulated substance takes place, which implies, that a chemical alteration has also taken place; and that even if the theory were true with respect to albumen, it will not account for the coagulation of the fibrine of the blood. Where chemistry fails to explain phenomena incident to living bodies, it is fair to inquire if life may not have some share in their production.

Mr. Hunter thought that the coagulation of the blood depended on its living powers, and supported his opinion by many ingenious arguments. To remove any objection which might be made to a fluid or unorganized substance being alive, he adverts to what happens with respect to the yolk and white of the egg, which, in consequence apparently of their possessing a principle of life, are preserved from putrefaction during incubation, and which resist the effects of heat and cold in a degree and manner similar to the lower kinds of animals. His chief arguments in evidence of the coagulation of the blood depending upon life are, that in some cases where death has been caused by lightning, or by violent fatigue in running, as in animals who are hunted to death, or by blows on the stomach, the irritability of the muscles has been destroyed, and the blood has remained fluid, and never coagulated. Mr. Hunter also mentions, that he mixed infusions of bitter vegetables, which are generally considered as tonics, with blood, and these did not retard its coagulation, but that a solution of opium had that effect. As a prosecution of this hint, the writer of the present article caused blood to be much diluted with water, and infusions of noxious vegetables to be stirred into it; yet in these experiments the fibrine still coagulated, and that in a sudden manner.

The vegetable infusions were those of opium, tobacco, and the atropa belladonna. It may be proper to relate the particulars of one of these experiments, in order to give a general idea of the whole. Eight ounces of blood were drawn from the arm into ten pints of water of 95° of Fahrenheit's thermometer, containing a strong infusion of the atropa belladonna. It was stirred with a glass rod; the two fluids appeared transparent and homogeneous. In eight minutes, the temperature being 93°, a considerable quantity of flocculent coagulum at once suddenly formed, and no additional coagulation afterwards took place. The thermometer was attentively observed, but no change was remarked in it during this coagulation. The gentleman who performed these experiments, wishing to repeat them with some variety in the mode of conducting them, observed, however, that heat was given out during the coagulation of the blood, as will be seen in the following experiment.

Ten ounces of blood were drawn into a wooden bowl, in which a thermometer was held. The temperature of the blood, while flowing from the vein, was 93°. In six minutes the thermometer had sunk to 89°, and coagulation commenced on the surface; on elevating the bulb of the thermometer to the coagulum on the surface, the quicksilver rose to 90 and $\frac{1}{2}$; on depressing it to the bottom of the bowl, it sunk to 89. This was repeated twice with nearly the same result, and on the third trial the quicksilver rose to 91°; and on depressing it again, it was perceived that the blood was

coagulated throughout. After this, the quickſilver regularly continued to deſcend, and was no longer influenced by changing the ſituation of the bulb of the thermometer.

With reſpect to the uſe of the red particles, Boerhaave ſuppoſed, that they might tend to keep the diſſimilar parts of the blood incorporated, as ſhot agitated in a mixture of ſand and water would prevent the ſubſidence of the former from the latter. It ſeems, however, no improbable opinion, that this is the matter which has the very peculiar properties of forcibly attracting oxygen gas, even through the medium of the blood veſſels, and combining with it, and becoming in conſequence of a ſcarlet colour, yet, of holding it ſo looſely as to part with it in the round of the circulation to carbon and probably to hydrogen, and thus contributing to the production of animal heat. The writer of the preſent article is of this opinion, becauſe he has expoſed the red parts of the blood to air containing oxygen gas, and always found the oxygen gas diminiſhed in proportion to the quantity of blood which had acquired a ſcarlet colour by expoſure to it. On the contrary, he has expoſed the ſerum of the blood to ſimilar kinds of air, and never perceived any abſtraction of oxygen gas by that fluid. Thus probably we diſcover the principles of nutrition of the body and the cauſe of its heat. For a further account of the effects of reſpiration on the blood and its conſequences, ſee LUNGS, *function of.*

Haller's elements of phyſiology may be conſulted for an account of all that had been done reſpecting the inveſtigation of the nature of the blood till his time; the works of Mr. Hewſon and Mr. Hunter may be referred to for additional information on this ſubject; the works of Fontana, for microſcopical obſervations; and for novel chemical experiments, the writings of Fourcroy, Vauquelin, &c. in the Annales de Chimie, and thoſe of Deyeux and Parmentier in the Journal de Phyſique, and Dr. Thomſon's excellent ſummary contained in his Syſtem of Chemiſtry.

BLOOD, *tranſfuſion of.* See TRANSFUSION.

BLOOD, *injecting liquors into it.* See INJECTION.

BLOOD, *ſpitting of.* See HÆMOPTYSIS.

BLOOD, *cooling of.* Lord Bacon has ſuggeſted that the proſecution of experiments on this ſubject might poſſibly lead to the means of prolonging life. But this great philoſopher appears to have entertained erroneous notions reſpecting the animal economy, on this and ſome other points. Nothing accurate was known, in thoſe days, on the ſubject of animal heat. If the blood were cooled below a certain ſtandard, diſeaſe and death, and not longevity, would be the conſequence. However, when the quantity of animal heat exceeds what is natural, the exceſs is carried off by an increaſed evaporation from the ſurface of the body, in other words, by perſpiration. And in this way, or by the direct application of water of a low temperature to the ſkin, the blood, as well as every other part of the body, may be ſaid to be cooled, and diſeaſe prevented or removed. But this is not what lord Bacon meant in his propoſal for cooling the blood.

BLOOD, *Depuration of.* See SECRETION.

BLOOD, *Flux of,* is called an HÆMORRHAGE. The periodical ones of women, MENSES. Thoſe after child-birth, LOCHIA. That ordinarily happening on the firſt coition is by ſome called and conſidered as the teſt of virginity.

BLOOD, *ſtaunching of.* See STYPTIC.

BLOOD, *vomiting of.* See HÆMATEMESIS.

BLOOD, *Circulation of the.* See CIRCULATION.

BLOOD, *morbid alterations of.* The alterations which the blood undergoes in various diſeaſes are ſuch as claim the attentive obſervation of phyſicians. But, in order to form a juſt conception of them, it is neceſſary previouſly to conſider what are the component parts of this vital fluid, and their relative proportions, in the natural and healthy ſtate.

By the accurate analyſes of modern chemiſts it has been proved, that, beſides water, and various ſaline matters (ſuch as ſoda, phoſphates of lime, of ſoda, and of ammonia, and muriates of ſoda and ammonia), the blood conſiſts of what is termed fibrin, albumen (coagulable lymph), and a colouring principle, viz. oxyd of iron combined with phoſphoric acid. Theſe ſeveral materials conſtitute the fluid called blood, which, in its natural ſtate, is kept in conſtant motion, under a temperature of 98° or 100° (in ſome animals the temperature is rather higher) of Fahrenheit's thermometer. A large proportion of fibrin, ſome albumen, and the colouring matter, conſtitute the cruor, or craſſamentum; while the ſerum is compoſed of water, with a large proportion of albumen, and the ſaline ſubſtances above mentioned.

Now, it is probable, that conſiderable alterations take place in the relative proportions of theſe ingredients, whenever the living body, whether of man or brute, becomes long or violently diſturbed in its action, and eſpecially (as Mr. Hewſon has ſhewn) whenever the energy of the vaſcular action is much increaſed. But in accounting for any remarkable alterations in the blood, there are ſeveral other circumſtances, beſides that of vaſcular action, which require to be noticed; and particularly the circumſtances connected with reſpiration, ſuch as the temperature, and purity or impurity of the ſurrounding air, its greater or leſs degree of humidity, &c. Theſe, by their chemical agency, muſt have a conſiderable influence in the production of the various morbid alterations which take place.

Many variations, however, in regard to the relative proportion of the conſtituent parts of the blood, and other chemical changes in its qualities, which in all probability frequently take place, are not obvious to the ſenſes, in ſome diſeaſes, whilſt in others they are very conſpicuous: for inſtance, in pleuriſy, peripneumony, acute rheumatiſm, &c. In theſe diſorders, the blood drawn from the veins, and ſuffered to ſtand in the cup until it is cold, becomes covered with a tough buff-coloured coat, or ſize, and is uſually called *inflamed,* or *inflammatory blood.* This ſize is formed (ſays Mr. Hewſon) by the coagulable lymph (which conſiſts of albumen and a portion of fibrin) being fixed or coagulated, after the red particles have ſubſided. The blood in theſe caſes does not appear to be thicker, but on the contrary thinner than natural. It is ſlower in coagulating than healthy blood. The coagulation is owing to the action of the air. Perhaps in pleuriſy, acute rheumatiſm, and other diſorders belonging to the phlegmaſiæ of noſological writers, ſome chemical change is produced in the fibrous matter of the blood (ſee Fourcroy, Connoiſſances Chimiques, article *Sang*), whereby it is preternaturally ſoftened or liquefied; or there may be an over-proportion of albumen, and that of an altered quality. Whatever be the real chemical difference, we cannot think with Mr. Hewſon, that it is wholly occaſioned by the increaſed force or energy of vaſcular action, ſince it ſometimes occurs in caſes where the action of the heart and arteries is not more vigorous than natural, and even where their action appears to be below the natural ſtandard. Thus a ſize has been ſometimes obſerved upon the blood drawn from patients affected with typhus (Parmentier and Deyeux in Fourcroy, as above referred to), and even on the blood taken from ſcorbutic patients. (Ibid.) And Mr. Hewſon himſelf remarks, that it is a common occurrence in pregnant women. Increaſed energy of vaſcular action is doubtleſs a principal cauſe of the changes obſerv-

able in fizy blood; but much is alſo to be aſcribed, in this buſineſs, to the circumſtances connected with reſpiration as before mentioned.

This fizy blood being ſo conſtantly ſeen in pleuriſy, peripneumony, acute rheumatiſm, and other inflammatory diſeaſes, it has been conſidered as a proof of the exiſtence of inflammatory action in all other caſes, wherein it has been obſerved; and has accordingly been deemed by many practitioners the beſt and ſureſt teſt or index when veneſection ſhould be repeated or withheld, as alſo concerning the quantity of blood which ſhould be drawn at each operation. But this is a very wrong mode of proceeding. We have ſhewn that this appearance (the ſize or buffy coat of the blood) is not reſtricted to diſorders belonging to the claſs of phlegmaſiæ, but that it occurs in other inſtances, where the free and frequent employment of phlebotomy would be uſeleſs, or even pernicious. Indeed, we have often found it neceſſary to repeat the uſe of the lancet, where this appearance of the blood has been wanting; and to abſtain from a repetition of it, where it has been preſent. In regulating, therefore, the abſtraction of blood, it is neceſſary to attend not only to the appearances of the blood, but more eſpecially to the kind of inflammatory action, to the ſtate of the pulſe and reſpiration, to the degree and ſeat of the pain, and to the age and conſtitution of the patient. Further, the term inflammatory blood, as being liable to miſconception and abuſe, ſhould be diſcontinued; and the expreſſion *fizy blood*, or *blood with a buffy coat*, ſhould be employed in its place. But if the term *inflamed blood* be improper, that of *putrid blood* is much more ſo. This was never yet drawn from any living animal, man or brute. Putridity is eaſily known. The ſmell affords an obvious teſt; but the chemical products obtained from animal ſubſtances in a ſtate of putrefaction, are the ſureſt teſts. Yet thoſe expert chemiſts, Meſſrs. Parmentier and Deyeux, could trace no marks of putridity in the blood taken from patients labouring under the worſt forms of typhus, or what are commonly called putrid fevers. Such blood did not yield, by diſtillation in a water bath, any volatile alkali; nor in a moderate temperature did it run into putrefaction ſooner than the blood of a healthy perſon. The blood in theſe caſes, however, has its peculiar appearances; which, until we arrive at ſomething more certain in regard to the cauſe thereof, we ſhould be content to call *typhus-fever blood*. In like manner, the dark-coloured blood of ſcorbutic patients (which ſome aſcribe to a deficiency of oxygen, and we would add of albumen alſo,) we ſhould be content to call *ſcorbutic blood*, until we have better data to proceed upon. Again, it is conjectured that the pale colour and dilute quality of the blood, in chlorotic and dropſical patients, may be owing to a deficiency of the colouring matter (iron) of the blood, as well as an under-proportion of the fibrous and albuminous matter. But we know not of any experiments by which this has been demonſtrated. Hence we muſt for the preſent be content to name ſuch blood *chlorotic* and *hydropic blood*; taking care at the ſame time to have it underſtood, that in uſing theſe terms, it is by no means intended to convey the idea, that ſuch a ſtate of the blood is the cauſe of chloroſis or dropſy, but merely the concomitant of thoſe diſorders. Whoever wiſhes to inveſtigate the ſubject of the morbid appearances of the blood more fully, ſhould conſult the writings of Hewſon and John Hunter; and for what relates to the chemical part of the inquiry, Fourcroy.

Blood, *Uſes of the*, are either in the animal œconomy (ſee Blood *ſupra*, and Lungs,), or in medicine, religion, diet, arts, manufactures, &c.

Blood, *mechanical and commercial uſes of the*, are chiefly in agriculture, where it is found an excellent manure for fruit-trees; among lapidaries; in the manufacture of ſugar, &c.; in building, boards are ſometimes rubbed with blood to turn them brown. Some alſo pretend it has anciently been uſed in the mortar of old walls. Blood is the baſis of that noble colour called by painters *Pruſſian Blue*. See Prussic Acid.

Blood, *eating of*. This practice appears to have been prohibited to Noah (Gen. ix. 3, 4), which prohibition was renewed by Moſes (Lev. xvii. 10—14.), and obſerved by the Jews, principally with a view to the uſe of ſacrifices in divine worſhip, and as a token of reſpect to the altar, at which the blood of every victim was preſented before God. The prohibition was repeated by the apoſtles at the council of Jeruſalem (Acts, xv. 28, 29.), confirmed and defended by all the fathers except St. Auguſtin, and the univerſal practice both of the eaſtern and weſtern churches till his time; and in many churches, even of the Weſt, much longer, as low as the middle of the 10th, ſome ſay the 11th and even the 12th century. The practice of the primitive Chriſtians ſeems to intimate that they underſtood the apoſtolical prohibition to be abſolute and perpetual, as they abſtained from the uſe of blood for many centuries. When they were charged with meeting in the night, and drinking blood, by way of binding one another to ſecrecy, in ſome immoral practices, Tertullian replies to this charge, that it was well known that no Chriſtian would eat blood at all; inſomuch, that it was uſual with heathens, when they wanted to know whether any perſon was a Chriſtian, to ſet blood-puddings before him as a very ſufficient teſt. Moreover, blood is not eaten by Chriſtians in any part of the Eaſt, or by the Greeks, or Ruſſians, who are of the Greek church, to this day; and it has been alleged, that the uſe of blood was not introduced into this weſtern part of the world till a very late period. When the Pomeranians were converted to Chriſtianity, in 1120, they were particularly enjoined to abſtain from blood, as a badge of their profeſſion. It was not allowed to be eaten in the Weſt in the time of Bede, or a century afterwards; and blood was not eaten in any part of Swiſſerland, till Calvin introduced the practice from ſome other place. Dr. Lardner, however, ſays (ubi infra), that little regard was paid to theſe regulations of the apoſtolical decree by the Latin Chriſtians, from the end of the fourth century.

The queſtion is, whether the apoſtolical precept to abſtain from blood, ſhould be conſidered as only temporary and occaſional, a ſort of accommodation to the weakneſs of the Jewiſh converts; or perpetual, founded on moral principles, and conſequently ſtill obligatory. The former opinion ſeems the more probable, and is the moſt generally received. For the prohibition in the law of Moſes, two reaſons have been aſſigned; one is, that the blood was appointed to make atonement on the altar for offence againſt the law. The prohibition, according to this reaſon of it, muſt be reſtricted to Jews and others circumciſed after the manner of Moſes; for no other perſons could offer ſacrifices, or be cut off for tranſgreſſing the Levitical laws, but ſuch as were of that people. The other reaſon is thus expreſſed: "It is the life of all fleſh; the blood of it is for the life thereof." (Lev. xvii. 14.); that is, as ſome have interpreted the paſſage, it is the nouriſhment of the animal, and not fit for your nouriſhment; and becauſe it was not fit for food, and was uſeleſs and offenſive, therefore it was to be poured out upon the earth, or covered with duſt, that is, buried in the earth; and this order is frequently repeated. Lev. xvii. 13. Deut. xii. 16. 24. xv. 23. Hence we may account for the conduct

duct of David, when his three warriors brought him water from the well of Bethlehem, at the extreme hazard of their lives (1 Chron. xi. 18.); considering the water as if it were their blood, which they hazarded to obtain it, he refused to drink it; and there being no rule or reason for offering such water upon the altar, he did what seemed to be next to offering it; "he poured it out before the Lord." The Jewish ordinance answered two obvious ends; it served, with other regulations and restrictions, to keep the Jewish people separate from other nations; and it also promoted their bodily health and vigour. But there is no foundation, either in the reason of the thing, or in the prohibition, to support the opinion of those who imagine the eating of blood to be an immoral thing; if this had been the case, God would not have permitted the Israelites (Deut. xiv. 21.) to sell a creature that died in his blood to an alien or stranger, that he might eat it. If, therefore, the eating of blood cannot be reckoned an immorality, the prohibition in the apostolical decree cannot be binding upon all men in all times, but only at some seasons, when the circumstances of things render forbearance or abstinence expedient. Accordingly, if blood be thought disagreeable and unwholesome, as food, the use of it may be avoided for the sake of health; but we are not obliged to abstain from it upon a religious account, or in virtue of this decree, which would be no better than superstition. It has been supposed, by some approved writers, and especially by Dr. Lardner, that this was only a temporary provision, designed to prevent giving offence to the believing Jews, and to facilitate civil converse and religious communion between believing Jews and Gentiles. Dr. Lardner also supposes that the decree is not to be understood as a precept or commandment, but as delivering advice and counsel concerning some matters of prudence and expedience, considering the circumstances of things and persons in that time. It has been farther urged as an argument against the perpetuity of the apostolical decree, that the apostle Paul never quotes, or alludes to it in his writings.

On the other hand it has been argued, that the prohibition to eat blood, given to Noah, seems to be obligatory on all his posterity: and as it accompanied the first express grant of animal food, it seems to be reserved, by way of acknowledgment to God, as the giver of life, and of the food which supports it. This respect paid to blood, which is shed when animals are killed for food, and which is the most apparent vehicle of life, may also be intended to inculcate a respect for life, as the most valuable gift of God, and to warn us not to deprive any animal of it, and much less man, without necessity. It has also been pleaded, as an additional argument for abstaining from blood, that it is not a wholesome aliment, especially in hot countries, promoting leprous and scorbutic disorders. The advocates of this opinion farther argue, that blood is prohibited because it tends to make men savage; that the prohibition is joined with that of fornication, which is an immorality in the common sense of the term, but which Dr. Lardner understands as denoting marriage with heathens, from which the apostle Paul so earnestly dissuades the Christians at Corinth: and that God has enjoined abstinence from blood on all Christians, in order to manifest his supreme dominion over all their enjoyments. Selden, de Jure Gentium, &c. l. vii. c. 1. Shuckford's Conn. vol. i. p. 93, &c. Lardner's Remarks on Dr. Ward's Dissertations in works, vol. xi. p. 329, &c. Priestley's Institutes, vol. ii. p. 439, &c.

Blood, *religious uses of.* Among the ancients, blood was used for the sealing and ratifying of covenants and alliances, which was done by the contracting parties drinking a little of each other's blood; for appeasing the manes of the dead, in order to which blood was offered on their tombs, as part of the funeral ceremony. Thus we read, that twelve youths were sacrificed at the funeral of Patroclus: and eight at that of Pallas. Homer. Il, Φ. ver. 27. Virgil. Æn. lib. x. ver. 518.

The blood of victims was the portion of the gods, both among Jews and Heathens; and accordingly was poured or sprinkled on the altars, in oblation to them.

Some have asserted, that the Romans offered human blood to appease their deities, which is denied by others.

The priests made another use of blood, viz. for divination: the streaming of blood from the earth, fire, and the like was held a prodigy, or omen of evil.

The Roman priests were not unacquainted with the use of blood in miracles; they had their fluxes of blood from images, ready to serve a turn; witness that said to have streamed from the statue of Minerva at Modena, before the battle at that place. But in this their successors have gone beyond them. How many relations in ecclesiastical writers of Madonas, crucifixes, and wafers bleeding! At least the liquefaction of the blood of St. Januarius, at Naples, repeated annually for so many ages, seems to transcend by far all the frauds of the Grecian or Roman priesthood. But the chemists are got into the secret, and we find M. Neumann at Berlin performed the miracle of the liquefaction of dried blood, with all the circumstances of the Neapolitan experiment. See Januarius.

Blood, in the *Romish Church*, is used in speaking of the wine in the eucharist; which they suppose miraculously converted, by the priest's consecration, into the real blood of Christ. See Transubstantiation, &c.

Blood, is also used abusively for the sap of plants; as having much the same office, in the vegetable, as the other in the animal œconomy. In a sense not unlike this, wine is sometimes also denominated the *blood of the grape*.

Blood is also applied, in *Pharmacy*, to certain vegetable juices, tears, &c. as dragon's blood gum. Dragon's blood, *sanguis draconis*, is also used by the Arabs for the juice of the anchusa.

Blood, *satyrion*, a ruddy liquor produced from the roots of *satyrium*, baked with bread; and liquefied, as it were, into blood, by a long digestion.

Blood, in *Chemistry* and *Alchemy*, is a denomination given to several artificial compositions, chiefly on account of their red colour.

Blood is more peculiarly used by the alchemists for the tincture of a thing. In which sense we meet with *blood of mercury*, denoting the tincture of it; dragon's blood, denoting the tincture of antimony.

Blood, *Dragon's*. See Dragon's *Blood*.

Blood is also used, in *Middle Age Writers*, for supreme jurisdiction, exercised by the lord of the fee, in cases where blood is spilt. This is also called "judgment of blood," "justice of blood," sometimes "cognizance of blood."

Blood, *avenger of*, among the Jews, was the next of kin to the person murdered, who was to prosecute the murderer. Ecclesiastical judges retire when judgment is to be given in cases of blood, because the church is supposed to abhor blood: it condemns no person to death; and its members become irregular, or disabled from their functions, by the effusion of blood.

Blood *of Christ*, is the denomination of a military order instituted at Mantua, in 1608, by Vinc. Gonzangua IV. Its device was "Domine probasti me;" or, "Nihil hoc triste recepto." Hermant speaks of this order, and observes that it took its name from some drops of the blood of Christ

ſaid to have been preſerved in the cathedral church of Mantua. The number of knights was reſtrained to twenty, beſides the grand-maſter; the office whereof was annexed to himſelf and his ſucceſſors.

Blood, in *Farriery*, denotes a diſtemper in cattle's backs, which makes them in going draw their heads aſide, or after them; the cure is by ſlitting the length of two joints under the tail, and thus letting the beaſt bleed plentifully. If he bleed too much, the farriers knit his tail next the body, and then bind ſalt and nettles bruiſed on the part.

Blood-*running itch*, is a ſpecies of itch in a horſe, proceeding from an inflammation of the blood by over-heating, hard riding, or other ſore labour; which getting between the ſkin and fleſh, makes the beaſt rub and bite himſelf; and if let alone, ſometimes turns to a grievous mange, highly infectious to all nigh him.

Blood, *field of*, in Syriac *aceldama*, was a field purchaſed by the Jews, with the thirty pieces of ſilver which had been given to Judas for betraying his maſter, and which he had reſtored. It ſtill ſerves for a burial-ground, in which all pilgrims, who die in their pilgrimage at Jeruſalem, are interred. See Aceldama.

Blood-*flower*, in *Botany*. See Hæmanthus.

Blood-*hound*. See Hound.

Blood-*letting*. See Bleeding.

Blood, *precious*, in *Eccleſiaſtical Hiſtory*, a denomination given to a reformed congregation of Bernardine nuns at Paris, firſt eſtabliſhed under that name in 1661.

Blood, *Princes of the*, in France, are thoſe deſcended from the blood royal.

Blood-*ſhotten*, in *Surgery*, a diſtemper of the eyes, wherein the blood-veſſels are greatly diſtended, ſo as to make the eyes appear red. See Ophthalmia.

Blood-*ſtone*. See Hæmatites.

Blood *of ſulphur*, *ſanguis ſulphuris*, is a preparation of liver of ſulphur, ground with the oil of tartar *per deliquium*, then digeſted with dulcified ſpirit of nitre. It is reputed a good pectoral and diuretic, but rarely preſcribed.

Blood-*veſſels*, in *Anatomy*, uſually include only the veins and arteries; though, in a larger ſenſe, all the veſſels in the body, as the nerves, lymphatics, &c. to the very hair, may be comprehended under the denomination. See Artery, and Vein.

Blood-*ſnake*. See *Blood*-Snake.

Blood-*wite*, in *Ancient Law Writers*, ſignifies blood, and a cuſtomary amercement paid as a compoſition for the ſhedding or drawing of blood.

The word is alſo written *blodwite*, *blodwita*, *blodwyta*, *bloodwit*, *blodwit*, *bloudwit*, and *bluidweit*; and is formed from the ancient Saxon *blud*, *blood*, and *vite*, or *wite*, a *fine* or *penalty*.

The word alſo denotes an exemption from this penalty, granted by the king to certain perſons and communities, as a ſpecial favour. Thus, king Henry II. granted to all tenants within the honour of Wallingford—"Ut quieti ſint de hidagio et blodwite et bredwite."

Blood-*wood*. See Hæmatoxylon.

Blood-*wort* or *Bloody Dock*, in *Botany*. See Rumex.

Blood, *Corruption of*, in *Law*. See Corruption *of Blood*.

Blood, *inheritable*, denotes ſuch a regular deſcent as gives a perſon legal right to inherit the eſtate of an anceſtor. See Attainder, Escheat, Inheritance, &c.

Blood, *Reſtitution in*. See Corruption *of blood*, and Pardon.

Blood, *Royal*, is applied to the regular deſcendants of the royal family. See Royal *Family*.

Blood, *whole* and *half*; a kinſman of the whole blood is he that is derived from the ſame pair of anceſtors; whereas a perſon of half blood deſcends from either of them ſingly, by a ſecond marriage. Blackſt. Com. vol. ii. p. 227. See Descent.

BLOODY Crime, *Sanguineum Crimen*, in *Writers of the Middle and Barbarous Age*, that which is puniſhed with the blood or life of the offender.

Bloody *Flux*, in *Medicine*. See Dysentery.

Bloody *Hand*, in *Law*, one of the four kinds of treſpaſſes in the king's foreſt, by which the offender being taken with his hands or other part bloody, is judged to have killed the deer, though he be not found either hunting or chaſing. In Scotland, in ſuch crimes, they ſay, taken in the fact, or with the red hand. See Backberond.

Bloody-*heel Cock*. See Heeler.

Bloody *Iſland*, in *Geography*, an iſland in the harbour of Port Mahon, in the iſland of Minorca.

Bloody *Point*, a cape on the ſouth-weſt coaſt of the iſland of St. Chriſtopher's. N. lat. 17° 24′. W. long. 62° 41′.

Bloody *Bay*, a bay on the north ſide of the iſland of Egmont, or New Guernſey.

Bloody-*Farland Point*, a remarkable head-land on the northern coaſt of the county of Donegal, Ireland, nearly oppoſite to Tory iſland. N. lat. 55° 9′ 30″. W. long. 8° 11′. M'Kenzie. Beaufort.

Bloody *Rains*. See Rain.

Bloody *Sweat*. Many inſtances of this are recorded, in which it has been owing to bodily diſorder, or extreme mental agitation and agony. See particularly Ariſtotle's Hiſt. Animal. lib. iii. cap. 19. apud Oper. tom. ii. Thuanus Hiſt. Temp. &c. lib. ii. apud Oper. tom. i. Melanges d'Hiſtoire et de Literature, &c. par M. V. Marville, tom. iii. p. 149. Acta Phyſico-Med. Norimbergæ, vol. i. p. 84. and vol. viii. p. 428. See Agony.

Bloody *Urine*, in *Medicine*. See Hæmaturia, and Urine.

BLOOM, in the *Iron works*, a term uſed by the miners for a four-ſquare maſs of hammered iron, about two feet long, and three quarters of a hundred weight, made from part of a ſow of caſt iron. The bloom, however, is not yet become iron fit for the ſmith's uſe, but muſt undergo many hammerings, and be firſt made what they call the *ancony*; which ſee.

Bloom, *half*, a round maſs of metal, which comes out of the finery of an *iron work*. See Blomery.

Blooms, in *Sea Language*, hot burning winds, blowing from the land to the ſea.

BLOOMFIELD, in *Geography*, a townſhip of America, in Ontario county, New York. By the ſtate cenſus of 1726, 151 of the inhabitants were electors.

BLOOMING Vale, a tract of land, in the townſhip of Manlius, and ſtate of New York, or Butternut creek.

BLOSSOM, in a general ſenſe, denotes the flower of any plant. See Flower. In a more proper ſenſe, the word is reſtrained to the flowers of trees, which they put forth in the ſpring, as the forerunners of their fruit, otherwiſe called their *bloom*. The office of the bloſſom is partly to protect, and partly to draw nouriſhment to the embryo fruit, or ſeed. Phil. Tranſ. N° 399. p. 329.

Blossom, in *Botany*, denotes one of the parts of a flower. See Corolla.

Blossom is alſo uſed in the *Manege*, for the colour of a horſe, whichhas his hair white, but intermixed all over with ſorrel and bay hairs, called alſo *peach-coloured*.

Horſes of this colour generally are hard and inſenſible, both in the mouth and the flank; ſo that they are little valued; beſides they are apt to turn blind.

Blossom, in reſpect of ſheep. See Blissom.

BLOT L'EGLISE, or *Blot le Roche*, in *Geography*, a town of France, in the department of the Allier, 10 miles W. of Gannat.

BLOTED *China Ware*, a name given by some to a sort of china that is loaded with colours in an irregular manner. This pleases some people, but it is a defective sort of ware, the large blotches of colours having been only laid on to cover the blemishes or faults in the first baking.

BLOTNO, in *Geography*, a town of Lithuania, in the palatinate of Wilna, on the river Rawie, 16 miles N. of Lida. N. lat. 54° 5′. E. long. 25° 34′.

BLOTTING PAPER, a species of paper, made without size or stiffening, serving to imbibe the wet ink in books of account, and prevent its setting off, or blotting the opposite page.

BLOTTING-*book*, a sort of minute book, or memorandum book, used by some merchants for making imperfect entries in a present hurry, which are to be copied out fairer and fuller at night into the journal.

BLOUNT, THOMAS, in *Biography*, a learned English writer, was born at Bordesley, in Worcestershire, in 1619; and, without the advantage of an university education, made a considerable progress in literature. By profession he was a barrister of the Inner Temple. Upon the breaking out of the popish plot in the reign of Charles II., he was much alarmed on account of his being a zealous Roman Catholic, and seized with a palsy, which terminated in his death, in 1679. His works were numerous, and are as follow: viz. "The Academy of Eloquence;" "Glossographica, or a dictionary interpreting such hard words, Hebrew, Greek, Latin, Italian, &c introduced into the English tongue," 1656, 8vo; "The Lamps of the Law, and the Light of the Gospel, &c.;" "Boscobel, or the History of his Majesty's Escape after the battle of Worcester," 1660, 8vo; the second part was printed in 1681, 8vo; "The Catholic Almanac for 1661, 62, 63, &c.;" "Booker refuted," or Animadversions on Booker's Ephemeris, 1665, 4to.; "A Law Dictionary," 1671, fol.; "Animadversions upon sir Richard Baker's Chronicle, &c." 1672, 8vo; "A World of Errors discovered in the New World of Words, &c." 1673, fol.; "Fragmenta Antiquitatis, ancient tenures of lands, &c." 1679. Biog. Dict.

BLOUNT, SIR HENRY, was born at the seat of his father sir Thomas Pope Blount, at Tittenhanger, in Hertfordshire, in 1602; and having completed his education at Trinity college, Oxford, he commenced the study of the law at Gray's Inn. Being resolved to travel, he set out on his tour in 1634, and visited the Turkish dominions in Europe, and also several parts of Egypt. After a long stay at Grand Cairo, he returned to England, in 1636, and published an account of his travels under the title of "A Voyage into the Levant, &c." Lond. 1636, 4to. which had a rapid sale, though it was not held in high estimation by the most competent judges. Charles I. appointed him one of the band of pensioners; and, on his father's death, in 1638, he succeeded to the family seat at Blount's hall in Staffordshire, and a considerable estate. In the civil war he joined the royal party; but abandoning the royal cause, he was well received in London by persons in power. In 1651, he became one of the committee for reforming the practice of the law; and he was very zealous against tythes, and for the reduction of the stipends of all parish ministers to an equal and moderate provision. His general knowledge recommended him to the office of one of the commissioners for advancing the trade and navigation of the commonwealth. His brother's death, in 1654, made way for his succession to the Hertfordshire estate. At the Restoration he was favourably received by the king; and in 1661 he served the office of high-sheriff for the county of Herts. From this time, till his death in 1682, he lived as a retired English gentleman; but he seems to have acquired from his travels an inclination to freedom of opinion, and to have adopted several singular and paradoxical notions. Six comedies, entitled "Court Comedies" and published under the name of John Lilly, have been ascribed to him. Biog. Brit.

BLOUNT, SIR THOMAS POPE, eldest son of the preceding, was born at Upper Holloway, near London, in 1649, and educated under the immediate inspection of his father. Having established an early reputation for learning and worth, he was created a baronet by Charles II. in 1679. He represented first the borough of St. Alban's, and afterwards the county of Herts, and was always esteemed as a friend of liberty, and a true patron of literature. Of his erudition he gave evidence in his learned work, entitled, "Censura Celebriorum Authorum," printed at London, in 1690, folio, and reprinted at Geneva in 1694 and 1710, 4to. This work is an accurate and useful compilation, containing an account of the characters and writings of both ancient and modern authors. His work "De Re Poëtica," published in 1694, 4to. is a similar compilation, comprehending an account of ancient and modern poets. His "Natural History," printed 1693, 12mo. is a kind of common-place book, containing observations, many of which are uncommon, selected from the best modern writers. Of his talents as an original writer, we have a specimen in his "Essays on several subjects," 8vo. in which he discusses many curious points; such as the influence of the priesthood; the regard due to the ancients; the variety of opinions; the uncertainty of human knowledge; the effects of custom and education, &c. He died at Tittenhanger in 1697, and left a numerous family. Biog. Brit.

BLOUNT, CHARLES, brother of the preceding, was born at Upper Holloway in 1654, and possessed distinguished talents, which were assiduously cultivated by his father, who assumed the direction of his studies. As he was the favourite of his father, he encouraged his marrying and settling in an independent estate at the early age of eighteen years. If we except a little treatise, published without his name, and entitled "Mr. Dryden vindicated, &c." his literary career commenced in 1678 or 1679, with the publication of his "Anima Mundi, or an historical narration of the opinions of the ancients concerning man's soul after this life, according to unenlightened nature;" in the composition of which he is said to have been assisted by his father. This work contained free opinions, which gave great offence; and though it had been previously licensed, was suppressed by order of Compton, bishop of London; and during his absence burned by some officious zealot. Several answers to it were written; and it was particularly animadverted upon in the second volume of Nichols's Conference with a Theist. In the same year Mr. Blount published some extracts from Hobbes's Leviathan, in a single sheet, entitled "Mr. Hobbes's last Words and dying Legacy;" and intended to expose, probably, the political principles of this writer. To these, his ardent zeal for liberty rendered him peculiarly adverse; and his zealous attachment to this cause was soon after manifested in a pamphlet, under the signature of "Junius Brutus;" designed to alarm the nation with regard to a popish plot, and the prospect of a popish successor to the crown. In 1680 he published his translation of "the Two First Books of Philostratus, concerning the life of Apollonius Tyanæus, with philological notes on each chapter," fol. which, being considered as a dangerous attempt to reproach and injure the Christian religion, was immediately suppressed, so that few

few copies of it could be obtained. This was followed, in the same year, by a work entitled "Great is Diana of the Ephesians, or the Original of Idolatry, together with the political institutions of the Gentiles' Sacrifices;" which, though professedly written against the impositions of the Heathen priests, was thought to be aimed at the Christian priesthood, and indirectly against all revelation. The author was now considered as the head of the Deistical sect, and he is charged with having taken great pains, by conversation and correspondence, to propagate and defend his opinions. In a letter to Dr. Sydenham, however, he acknowledged, that in point of practice, Deism was less satisfactory than the Christian scheme. The clamour occasioned by his former publications made him somewhat more cautious and reserved; and accordingly he studiously concealed his being the author of a treatise, entitled "Religio Laici;" published in 1683, and said, by Dr. Leland, in his Deistical writers, vol. i. p. 37. to be little more than a translation of Lord Herbert's work, under the same title; and he also abandoned the design which he had formed of writing a life of Mahomet. From this time he seems to have changed the objects of his study; for in 1684 he published "Janua Scientarium; or an Introduction to Geography, Chronology, Government, History, Philosophy, and all genteel sorts of learning;" 8vo. which was intended to assist young persons at an early age in the acquisition of principles of philosophy and science, without pursuing the tedious course that had been usually prescribed to them in schools.

Mr. Blount was one of those who cordially concurred in the revolution: and in a letter addressed to W. Leveson Gower concerning corporations, and inserted in the "Oracles of Reason," he expresses his wish, that those counsellors of the late king, who had injured the independence of parliament, might be punished, justly considering the purity of representation as the essence of a free constitution. About this time he wrote his treatise entitled "A Just Vindication of Learning, and of the Liberty of the Press;" which is esteemed one of his best performances, and a summary of all the principal arguments that can be urged upon this topic. In his zeal for the cause of king William, he wrote a pamphlet in 1693, intended to prove the right of William and Mary to the crown, on the ground of conquest; and in explanation of this design, so dissonant, one would imagine, with his principles, and no less obnoxious than ill-founded, he declares that he wrote "with an especial regard to such as have hitherto refused the oath, and yet allow of the title of conquest, when consequent to a just war." By this performance he gave such offence, that, on a complaint being brought before the house of commons against this pamphlet, entitled "William and queen Mary Conquerors," it was ordered to be burnt by the hands of the common hangman; and in the same censure was involved a pastoral letter of bishop Burnet, in which the same notion was advanced, probably with the same views.

Mr. Blount, having lost his wife, became ardently enamoured of her sister, a lady of great beauty and merit, who seemed disposed to return his affection; but as the ecclesiastical laws opposed their union, he drew up a case strongly argued, and referred it to certain divines, who of course gave their opinions against his wishes. As the lady refused to comply, after such a determination, Mr. Blount sunk into despair, and at length shot himself through the head.

After this act of phrensy, he languished for some days, receiving no nourishment but from the hands of the object of his affection, till at last death released him, August 1693. Many of his private letters and some small tracts were published, together with a preface, by Gildon, in 1693, before the author's death, in a work entitled "The Oracles of Reason;" which was afterwards re-printed, with some additional pieces, after his decease, in 1695, in a collection of "The Miscellaneous Works of Charles Blount, esq." by the same Mr. Gildon, who prefixed to it an account of the life and death of the author. The learning of Mr. Blount is unquestionable, and he seems to have possessed a strong and ardent mind; but his early dislike of superstition precipitated him into some very considerable errors, and inclined him to believe all revealed religion to be priestcraft, because he perceived that some priests had converted religion to their own secular advantage. His sentiments on the subject of religion were divulged in his writings without disguise, and sufficiently warrant our referring him to the class of deists; but the charge of atheism alledged against him by some foreign divines, is certainly unfounded. See an account of Mr. Blount's writings by Dr. Leland, in the fourth letter of his View of the Deistical Writers, vol. i. By this author we are informed that Mr. Gildon, who published the "Oracles of Reason," and communicated them to the world, was afterwards, upon mature consideration, convinced of his error, and in 1705 published his retractation in a book, entitled "The Deist's Manual." The greatest part of this book is intended to vindicate the doctrines of the existence and attributes of God, his providence and government of the world, the immortality of the soul, and a future state. And his avowed reason was, because many of the deists, with whom he was well acquainted, did really deny those great principles, which lie at the foundation of all religion, or at least, represented them as doubtful and uncertain. And their not admitting natural religion in its just extent, formed some of their principal prejudices against the Christian revelation. Biog. Brit.

Blount, in *Geography*, a new county of the State of Tenessee, in America, bounded southerly by lands retained by the Indians. It contains 5526 inhabitants, of whom 339 are slaves.

BLOUNTSVILLE, a town of America, in North Carolina, on the post-road from Halifax to Plymouth, 49 miles from Plymouth, and 55 from Williamstown.

BLOW, in a general sense, denotes a stroke given either with the hand, a weapon, or instrument. The effect of a blow is estimated like the force of percussion, and accordingly it is expressed by the velocity of the body multiplied by its weight.

In *Fencing*, blows differ from thrusts, as the former are given by striking, the latter by pushing. We say to give, to return, to parry a *blow*. (See Parrying.) Blows on the sword make a kind of pursuit, called beating.

Blow, *blind*, *ictus orbus* or *cæcus*, is that which does not appear, or is not attended with effusion of blood; in contradistinction from that followed by a wound, discolouring, *tumour*, or the like, called *ictus apertus* or *apparens*, an open *blow*.

In the ancient laws, we find blows for remembrance, given to make persons remember some transaction, and enable them to become better witnesses of it in future times.

Blow, *military*, *alapa militaris*, that given with the sword on the neck or shoulder of a candidate for knighthood, in the ceremony of dubbing him. The custom seems to have taken its rise from the ancient ceremony of manumission.

In giving the blow, the prince used this form: "esto bonus miles;" upon which the party rose a complete knight, and qualified to bear arms in his own right. Sometimes a double or even triple blow was given, called *trina percussio*.

Blow, Dr. John, in *Biography*, born at North Collingham, in Nottinghamshire, was one of the first set of children of the chapel royal after the restoration, that was brought up under captain Cook. He likewise received instructions from

from Hingeſton, domeſtic organiſt to Oliver Cromwell, and Dr. Chriſt. Gibbons. In 1673, he was ſworn one of the gentlemen of the chapel; and in 1674, upon the deceaſe of Humphrey, appointed maſter of the children. In 1685, he was nominated one of the private muſic to king James II. and in 1687, he was likewiſe appointed almoner and maſter of the choriſters in the cathedral church of St. Paul: but, in 1693, he reſigned this laſt place in favour of his ſcholar Jeremiah Clark.

Blow had his degree of doctor of muſic conferred on him by the ſpecial grace of archbiſhop Sancroft, without performing an exerciſe for it in either of the Univerſities. On the deceaſe of Purcell, in 1695, he was elected organiſt of St. Margaret's, Weſtminſter; and, in 1699, appointed compoſer to the chapel of their majeſties, king William and queen Mary, at a ſalary of 40l. a year, which afterwards was augmented to 73l. A ſecond compoſer, with the like appointment, was added in 1715, when John Weldon was ſworn into that office; at which time it was required that each ſhould produce a new anthem on the firſt Sunday of his month of waiting.

That Blow was a compoſer of anthems, while a ſinging-boy in the chapel royal, appears from Clifford's Collection of the Words of the Services and Anthems uſed in our collegiate and cathedral churches, 1664; for among the eccleſiaſtical compoſers mentioned in this book, amounting to upwards of ſixty, are included the names of Pelham Humphrey, John Blow, and Robert Smith, children of his majeſty's chapel. Humphrey was born in 1647, and Blow in 1648; ſo that at the reſtoration, the firſt being only thirteen, and the ſecond but twelve, their compoſing anthems fit for the chapel royal, before they had attained the age of ſixteen or ſeventeen, would now be regarded as wonderful proofs of precocity, if Purcell, ſoon after, at a more early period of his life, had not produced compoſitions that were ſtill ſuperior to theſe.

Dr. Blow died in 1708, at ſixty years of age: and though he did not arrive at great longevity, yet, by beginning his career, and mounting to the ſummit of his profeſſion ſo early, he enjoyed a proſperous and eventful life. His compoſitions for the church, and his ſcholars who arrived at eminence, have rendered his name venerable among the muſicians of our country.

Though his church muſic was never collected in a body, yet, beſides the three ſervices and ten full and verſe anthems printed by Boyce, in Dr. Tudway's MS. collection, nineteen of his choral productions have been preſerved; and in Dr. Aldrich's collection in Chriſt-church there are five more. The aggregate of which, amounting to upwards of forty different compoſitions of this elaborate kind, is but a ſmall part of what might be found in the chapel and choir-books of our cathedrals.

Some of his choral productions are doubtleſs in a very bold and grand ſtyle; however, he is unequal, and frequently unhappy, in his attempts at new harmony and modulation; but, as a compoſer who ranked ſo high among our moſt claſſical maſters ſhould not be praiſed or cenſured indiſcriminately, we ſhall point out a few inſtances of his great, and to our conceptions, unwarrantable licentiouſneſs, as a contrapuntiſt.

We are as ſorry to ſee, as to ſay, how confuſed and inaccurate a harmoniſt he was; but as it is neceſſary to ſpeak of an artiſt ſo celebrated and honoured by his contemporaries, to diſſemble his faults would ſurpaſs candour, and incur the cenſure of ignorance and partiality; for it is as much the duty of an hiſtorian to blame as to praiſe, when juſtice and integrity require it. Indeed, upon whatever ſubject a man writes, he ſhould aſpire at nothing ſo much as ſpeaking truth, of he wiſhes for the approbation of his conſcience, which is not only the moſt comfortable of all praiſe, but, luckily, the moſt within his own power. The abilities of the dead, we can have no intereſt in depreciating; and if our opinion ſhould be unjuſt, the miſchief will recoil on ourſelves; for the dead have more friends than the living, who are ever ready to vindicate ſuch wrongs.

Though there are ſtrokes of pathetic and ſubjects of fugue in Blow's works that are admirable; yet we have examined no one of them that appears to be wholly unexceptionable, and free from confuſion and crudities in the counterpoint. Of the two-part anthem with choruſes, "Lord how are they increaſed," the firſt movement is very plaintive and expreſſive; but there are licences in the harmony which look and ſound quite barbarous. Indeed, theſe crudities are ſo numerous as to throw a doubt on his learning, as well as genius. Whether they are notes of paſſion, effuſions of an unruly ſpirit, or of ignorance and affectation, we will not venture to determine; but to our ears, they have the full effect of jargon and want of principles.

It does not appear that Purcell, whom he did himſelf the honour to call his ſcholar, or Croſts, or Clark, his pupils, ever threw notes about at random, in his manner, or inſulted the ear with lawleſs diſcords, which no concords can render tolerable.

In an anthem, "Turn thee unto me, O Lord," printed by Henry Playford in the ſecond collection of Divine Harmony, there are ſo many wanton violations of rule, parcularly in the laſt chorus, that it would be endleſs to point them out; but they ſeem ſuch as no rule, authority, or effect, can juſtify; 7ths reſolved on the 8th, aſcending and deſcending; 2ds treated with as little ceremony as 3ds. Indeed, we never ſaw ſo ſlovenly a ſcore in print; and it may, in general, be ſaid of his faults in counterpoint, that there are unaccounted millions of them to be found in his works.

He has been celebrated by Dr. Boyce, for "his ſucceſs in cultivating an uncommon talent for modulation;" but how ſo excellent a judge of correct and pure harmony could tolerate his licences, or reconcile them to his monumental character, and the additional praiſe he has himſelf beſtowed upon him, is as unaccountable as any thing in Blow's compoſitions, conſidering the knowledge and known probity of the late worthy editor of Cathedral Muſic.

Many of his ballads, though only in two parts, are full of crude diſcords unprepared and unreſolved; the cauſe of which, in ſome meaſure, may be aſcribed to the *ground-baſes*, on which it was now the faſhion to write: for melody being ſcarce, both that and the harmony were frequently injured by this Gothic reſtraint. But the paſſing-notes and notes of embelliſhment of the compoſers, in general, of this period, were uncouth in melody, and licentious in harmony. Perhaps thoſe of the preſent times, in leſs than a century, will be equally unpleaſing to the ears of poſterity; and yet we fancy that both melody and harmony have received their laſt poliſh.

The ballads of Dr. Blow are in general more ſmooth and natural than his other productions, and, indeed, than any other ballads of his time; there is more melody than in thoſe of Henry Lawes, or any compoſer of the preceding reign; yet it is not of that graceful kind in which the Italians were now advancing towards perfection, with great rapidity. It is either of a Scots caſt, or of a languid kind, that excites no other ſenſation than fatigue and drowſineſs.

His paſtoral, "Since the Spring comes on," is, however, as *chantant* as any mongrel mixture of Scots, Iriſh, French, and Engliſh, that has been ſince compiled.

piled. The first movement particularly, seems to have been the model of most of the Vauxhall songs of the last fifty years.

"Fill me a bowl," p. 52, has the same kind of merit.

The collecting of his secular compositions into a folio volume in 1700, under the title of "Amphion Anglicus," was doubtless occasioned by the great success of the "Orpheus Britannicus," a similar collection of Purcell's dramatic and miscellaneous songs, published by his widow, in 1698. But whether Dr. Blow was stimulated to this publication by emulation, envy, or the solicitation of his scholars and friends, by whom there are no less than fifteen encomiastic copies of verses prefixed to the work, the ungrateful public seems to have remained always insensible to these strains of the modern *Amphion*, which were not only incapable of building cities, but even of supporting his own tottering fame.

Some of his innumerable deformities from the Amphion Anglicus are added to those of his church music, in the third vol. Gen. Hist. Mus. "Go perjured man," is the best of all his secular productions; but that, which was an imitation of a duet by Carissimi, "*Dite, O cieli*," is overloaded in his "Amphion Anglicus," with a laboured and unmeaning accompaniment. P. 44 and 46 of this collection, contain two of his best ballads, "Sabina has a thousand charms," and "Philander do not think of arms." In these ballads the union of Scots melody with the English, is first conspicuous. The subject of a song, p. 168, "Orithea's bright eyes," is likewise broad Scots.

Blows, in *Common Law*. See Battery.

Blows, *fly*, the *ova* of flies deposited on flesh, or other bodies proper for hatching them.

Blow, in the *Sea Language:* when the wind increases from a moderate breeze, it is said to blow; and, according to the various degrees of strength with which the wind blows, it receives different appellations.

Blow-pipe, *Tubus ferruminatorius*, Lat.; *Löthrohr*, *Blaserohr*, Germ.; *Chalumeau*, Fr. A blow-pipe is a wind instrument for the purpose of increasing the heat of a candle or lamp, in the same manner as a pair of bellows is employed for raising the temperature of a common fire or furnace. It is not known at what time or by whom this very useful instrument was invented, but it appears to have been employed by glass-workers, enamellers, and jewellers, long before it was adopted as an article of chemical apparatus. The first intimation of its value to the chemist is to be found in Kunkel's treatise on glass-making.

The common glass-blower's lamp is represented in *Plate* X. *fig.* 1. (*Chemistry*). A, is a wooden table, within the frame of which is fixed a pair of double bellows B, that are worked by the foot of the artist; from the nozle of the bellows proceeds a pipe of lead, or tinned iron, CC, which, first rising perpendicularly, is then brought under the top of the table to D, where it penetrates the wood, and terminates on its upper surface, in a recurved hollow cone E, the apex of which is pierced with a minute round hole. A shoe-lamp, F, is placed on the table, so that its wick is somewhat below, and about half an inch distant from the aperture of the pipe; the bellows being then worked, a constant stream of air is thrown upon the wick of the lamp, producing a long conical horizontal flame, G, of very considerable intensity. The increased heat of the flame appears to depend, in part, on a more rapid and complete combustion of the oil, and in part, also, on the concentration of the flame, by the action of the blast. The flame, upon examination, will be found to consist of an exterior yellow cone, inclosing another of a lighter yellow colour, at the extremity of which last is the focus of greatest heat.

The shoe-lamp (more distinctly represented in *fig.* 2.) is so called from its resemblance to a shoe. It is made of tinned iron, and consists of two parts; the exterior, *a*, serves to hold the proper lamp, and to retain the oil, which occasionally drops from the wick; the lamp, *b*, has a fixed cover, except at the tip, *c*, where a circular aperture is left for the wick *d*, which consists of a bundle of cotton threads, about an inch in diameter; at *e* is a hinge, by which that part of the lid nearest the wick may be raised, in order to pour in fresh oil, or to renew or raise the wick.

The glass-worker's blow-pipe is, however, not sufficiently portable for the use of the chemist and mineralogist, and it was a happy thought of Swab, the Swedish mineralogist, to substitute the lungs for the bellows. Gahn, Engestroem, and Bergman suggested various improvements in the construction of this instrument, which now appears to have attained as great a degree of perfection, as it is perhaps capable of.

The common chemical blow-pipe consists of five parts; (*Chemistry*, *Plate* XI. *fig.* 3.) the mouth piece, *a*; a plain tube, *b*; a bulb, *c*; a curved tube, *d*; and a nut, *e*.

The mouth-piece (more distinctly represented by *fig.* 5.) is made of ivory, the rest of the apparatus being of brass, and fits closely into the pipe, *b*, so as to be air-tight; the bulb, *c*, is divided into two hemispheres, which screw into each other, and is designed to collect and condense the moisture of the breath; into the lower hemisphere is fixed the recurved tube, *d* (as represented in *fig.* 4.), in such a manner as to prevent the condensed vapour from escaping out of the bulb; the nut, *e*, is a hollow cylinder sufficiently wide at one end to receive the extremity of the curved tube, and perforated at the other with a small round hole, to allow a passage for the air; each blow-pipe has generally three of these nuts (*fig.* 6.), with apertures of different sizes, the largest of which does not exceed the diameter of the smallest pin.

In using the portable blow-pipe, the only difficulty is to keep up a constant stream of air; which is to be done by performing the function of respiration through the nostrils alone, diverting from time to time a portion of the *expiration* into the mouth for the supply of the blow-pipe, and forcing it through the tube by the action of the muscles of the cheek. This knack is by some acquired in an instant, while others are a long time in making themselves masters of it. To those who experience any difficulty in the free use of this instrument, the following directions may be of service. First, let the learner accustom himself to breathe freely with the mouth shut; then in making an expiration, let him transfer the air into the mouth, till the cheeks are moderately inflated, and retaining it there, let him discharge the surplus of the expiration through the nostrils, and then make two or three easy inspirations and expirations through the nostrils, without allowing the air in the mouth to escape. When practice has rendered this easy, which may be effected in half an hour, let the nut with the smallest aperture be fixed on the curved tube of the blow-pipe, and introduce the mouth-piece within the lips; then inflate the cheeks by an expiration, and continue breathing easily through the nostrils, till nearly the whole of the air has passed out of the mouth through the tube; then renew the air as before, and, after a few days' practice, the muscles of the mouth will be accustomed to this new mode of exertion, and an uniform uninterrupted stream of air may be kept up for half an hour without any extraordinary fatigue. A wax candle, *f*, having burnt long enough to allow the wick to be turned down, in the manner represented in the plate, the nut of the blow-pipe is to be applied to the arch of the wick, and the air, as it comes through, will bend the flame into a neat horizontal cone, the exterior part of which is yellow, and the interior

interior blue. The ſubſtance under examination being reduced to the ſize of a peppercorn, is to be placed in the platina ſpoon *fig.* 7. or into a ſhallow cavity in a piece of compact charcoal, and being firſt gradually heated by the yellow flame, *g*, is afterwards to be expoſed to the full intenſity of the blue focus, *h*.

An important uſe of the blow-pipe in the laboratory is to ſoften glaſs-tubes, &c. in order to bend them to any ſhape that may be required, for which purpoſe the blow-pipe juſt deſcribed is not very well qualified, the flame not being large enough, and, from its intenſity at the blue focus, acting very unequally. It may, therefore, in theſe, and ſimilar caſes, be advantageouſly ſuperſeded by the alcohol blow-pipe.

This inſtrument, the invention of which is due, we believe, to M. Paul and profeſſor Picket of Geneva, has received ſome improvements from Engliſh artiſts, and is figured in *Chemiſtry*, *Plate* XI. *fig.* 1. and 2. It is made of braſs, and conſiſts of the following parts: A is an oval baſe, in which are two round holes, for the reception of the two ſpirit lamps, B, and C, the latter of which has a conſiderably thicker wick than the former. D is a pillar that ſcrews into the baſe, and ſupports a moveable braſs collar, E, which may be retained at any convenient height by the ſcrew, F. L is the boiler hanging looſely, but ſecurely, in the collar, E; M is a ſcrew accurately cloſing an aperture in the boiler, through which it is filled with alcohol; I is a conical plug, ſerving as a ſafety-valve, the reſiſtance of which to the expanſion of the vapour is regulated by the ſteel ſpring H, compreſſed between the ſcrew nuts G and K; O is the delivering pipe, ſeen more particularly at *fig.* 2. It conſiſts of a plain tube, *a*, ſomewhat longer than the depth of the boiler, of a ſhoulder and ſcrew, *b*, by which it is fixed in the bottom of the boiler, of a ball and ſocket joint (compoſed of the ſphere, *c*, *d*, inclo-ſing the perforated bulb and ſtem *e*, *f*), and of the nut *g*, terminated by a ſmall aperture, &c. ſcrewing on the ſtem, *f*. N (*fig.* 1.) is a hollow cap, ſcrewing into the boiler, and receiving the head of the tube, *a*, to prevent any liquid alcohol from being thrown into it. This blow-pipe works in the following manner: The boiler being filled with alcohol, and the ſcrews and valve ſecured, the lamps, B and C, are lighted. The alcohol in the boiler being brought to ebullition by the lamp B, the vapour aſcends into the cap N, whence it paſſes down the tube O, and is diſcharged at P, upon the wick of the lamp C, producing a long bulky horizontal flame Q, whoſe extreme temperature is nearly equal to that of melting copper, and is admirably fitted for the working of glaſs.

Mr Benjamin Hooke, lately an ingenious mathematical inſtrument-maker in Fleet Street, has made ſome improvements in the blow-pipe by alcohol; for a deſcription and drawing of which we refer to Nicholſon's Journal, vol. iv. p. 106. 8vo.

The blow-pipe is of conſiderable uſe to the mineralogical chemiſt, from its being very portable, and ſhewing, in a few minutes, upon a very ſmall quantity of any mineral ſubſtance, the effect that would be produced by its expoſure to the heat of our moſt powerful furnaces. It is alſo a valuable inſtrument in the analyſis of minerals, by indicating their principal contents, rudely and imperfectly indeed, yet ſo as to afford a clue to the chemiſt in his ſubſequent operations.

The efficacy of the blow-pipe, in fuſing the moſt refractory ſubſtances, is, however, greatly increaſed by charging it with oxygen gas; a heat is thus produced, fully equal to that of the ſolar rays concentrated by the beſt lenſes. The apparatus for this purpoſe conſiſts of the common blow-pipe, with the mouth piece taken out, and connected to a gazometer, by a flexible tube of elaſtic gum; the curved tube and terminating nut of the blow-pipe ought, however, to be made of platina, the heat produced being ſo intenſe as frequently to fuſe and inflame thoſe parts of the inſtrument, if made of braſs. The operator ſhould alſo be careful to wear ſpectacles of green glaſs, in order to protect his eyes from the intolerable white glow, which is ſo intenſe as to cauſe even the flame of a common wax candle to caſt a very ſenſible ſhade. Sometimes a double blow-pipe is made uſe of in experiments with oxygen gas, by which the effect is conſiderably increaſed. A repreſentation of this is ſeen in *Chemiſtry*, *Plate* X. *fig.* 3. The part, *a*, which joins the tube of the gazometer, turns air-tight in the collar, *b*, on the end of the tube *b*, *c*. On this tube are two braſs boxes, *d*, *e*, into which are fitted the tubes, *f*, *g*, which alſo turn in air-tight ſockets, for the purpoſe of enabling the operator to move the blow-pipes, *h*, *i*, nearer to [illegible] rather from each other. The blow-pipes, *h*, *i*, are alſo [illegible] at *k*, *l*, by which the direction of the blaſts may be [illegible], ſo as to meet on the charcoal *m*, at any angle that may be required.

The cauſe of the great heat which is p[illegible] pipe, has generally been attributed both [illegible] of the flame in a ſmall focus, and a more [illegible] than uſual. Count Rumford, howe[illegible] p. 69.) ſuppoſes that the effect of this [illegible] due to the former of theſe cauſes; and [illegible] pothesis, he mentions the reſults of ſome exper[illegible] by himſelf, which are ſo contrary to daily [illegible] were conducted in ſo inaccurate a manner, as to deſerve, in our opinion, very little confidence.

He begins by ſaying, "A current of air cannot *general* heat, without, at the ſame time, being decompoſed; and, [illegible] order to its being decompoſed in a fire, it muſt be brough[illegible] into actual contact with the burning fuel, or at leaſt with the uninflamed inflammable vapour which riſes from it. But can it be ſuppoſed that there can be any thing inflammable, and not actually inflamed, in the clear, bright, and perfectly tranſparent flame of a wax candle? A blow-pipe has, however, as ſenſible an effect when directed againſt the clear flame of a wax candle, as when it is employed to increaſe the action of a common glaſs-worker's lamp." To this it may be replied, in the firſt place, that flame is not tranſparent; and, ſecondly, that a conſiderable quantity of "uninflamed inflammable matter" is contained in the flame, as is evident from the ſoot that may be collected by holding a plate of glaſs or metal over it, ſo as juſt to touch the ſummit. The count proceeds to relate that carbonic acid being driven by a blow-pipe through the "clear, brilliant flame of a wax-candle juſt ſnuffed," melted a ſmall tube of glaſs in the ſame time as when the pipe was charged with atmoſpheric air, or even with oxygen gas. We have repeated theſe experiments, and obſerved, that when the blaſt was directed to the whiteſt part of the flame, no well defined horizontal cone was produced by any of the three gaſes; that when carbonic acid, or the breath, was paſſed through the flame juſt above the wick, a well defined cone was produced, the interior of which was of a light blue, and the exterior of a pale yellow; when atmoſpheric air was employed, the whole cone was of a bright yellow; and, with oxygen gas, the whole flame was of a dazzling white. The effect of the ſecond in melting glaſs was greater than that of the firſt, and the laſt was much more powerful than the ſecond. Neri, art de la Verrerie. Bergman's Eſſ. vol ii. Philoſophical Magazine, vol. viii. p. 325.

BLOWER, *ſouffleur*, an appellation of contempt, ſometimes given to an alchemiſt.

In the French king's kitchen, there was anciently an officer

ficer under the denomination of *fufflator*, or *fire-blower*. The Roman mint-men were diftinguifhed by the appellation of blowers of gold, filver, and brafs, &c. *flatores auri, argenti.*

Blower, among dealers in horfes, a term ufed for fuch horfes as wheeze much, without wanting wind. See Wheezing.

BLOWING, in *Medicine*. One method of adminiftering medicines is by inflation, or blowing them into the part by a tube; thus it is they fometimes convey powders into the eye, and fometimes up the nofe, for the cure of a polypus.

Blowing, *exfufflatio*, was alfo a ceremony in the ancient adminiftration of baptifm, whereby the catechumen, upon rehearfing the renunciation, blew three blafts with his mouth, to fignify that he rejected or caft the devil abfolutely off.

Something like this is ftill retained in the Ruffian church. In the facramentary of St. Gregory, the prieft who adminifters baptifm, is enjoined to blow thrice on the child's face, making the fign of the crofs with his hand, and pronouncing the words *exi ab eo Satan*. Juftin Martyr, Tertullian, St. Cyril, and St. Auguftin fpeak of this ceremony as ufed in their times.

Blowing *of a fire arm*, is when the touch-hole is run or gulled, and become wide, fo that the powder will flame out.

Blowing is alfo ufed in fpeaking of the natural motion or courfe of the wind.

In the *Sea-Language*, the wind is faid to *blow home*, or *blow through*, when it does not ceafe, or grow lefs, till it comes paft the place where the fpeaker is. To *blow through* is fometimes alfo ufed to denote, that the wind will be fo great as to blow afunder the fails. When a wind increafes fo much that they cannot bear any top fails, they fay, they were *blown into their courfes*, i. e. they could only have out the fails fo called. To exprefs an extraordinary great wind, they fometimes fay, it will blow the fail out of the bolt-ropes.

Blowing is alfo ufed in fpeaking of the force and effect of kindled gunpowder on bodies which happen to be over it. In this fenfe we fay to blow up a houfe. Engineers at fieges make mines wherewith to blow up walls, baftions, and other defences. Powder-mills are apt to blow up by the iron gudgeons growing hot, and fetting fire to the powder duft flying about.

Blowing, among *Gardeners*, denotes the action of flowers whereby they open and difplay their leaves. In which fenfe, blowing amounts to much the fame with flowering and blofforning.

Blowing of Glass, one of the methods of forming the divers kinds of works in the glafs manufacture. It is performed by dipping the end of an iron ponteglio, or blowpipe, in the melted glafs, and blowing through it with the mouth, according to the circumftances of the glafs to be blown.

Blowing *of tin*, a term ufed by the Cornifh miners for the fufion or reduction of tin-ore to the metallic ftate, after having been roafted to get rid of the fulphur and arfenic.

Blowing *Machine*, is ufed in metallurgical operations on a great fcale, for the purpofe of exciting combuftion in furnaces appropriated for the fmelting and reducing of ores.

The hiftory and improvement of machinery of this nature have kept pace with the other branches of our national manufacture, and, in many inftances, may be juftly faid to have gone beyond them.

In the fmelting of lead and tin ores, the fize and powers of the blowing machine have been lefs a fubject of alteration and improvement, than thofe ufed at furnaces and works where iron ore is fmelted.

The natural fufibility and eafy volatilization of the former metals, in temperatures beyond a bright red heat, have prefcribed the fize of the furnace, the meafure of the blaft, and the nature of the fuel.

In the manufacture of copper, air-furnaces are generally ufed, except where precipitated oxyd of copper is revived in fmall blaft-furnaces, refembling thofe called cupolas, ufed at iron founderies.

The conftruction of a lead fmelting machine, or what is commonly called a "Lead Mill," is extremely fimple. A water wheel is erected in the middle of a fquare building. To the fhaft of this wheel are attached four fmall wheels of caft iron, about 18 inches diameter. Four pairs of bellows, two pairs on each fide of the fhaft, are placed at equal diftances, and fupported upon a ftrong framing of wood. As the water wheel fhaft revolves, the fmall wheels are carried round, and alternately, or two and two together, depref the extremity of a lever attached by an iron chain to an equipoifed beam, the defcent of this lever elevates the oppofite end of the beam, to which is alfo attached, by means of another iron chain, the upper or moveable furface of the bellows. The blaft produced in this way is in general foft, much inferior in point of either quantity or denfity to what is found neceffary at iron furnaces. The bellows in common meafure 10 feet in length, and 5 or 6 feet acrofs the breach, moving about 30 ftrokes per minute.

In the manufacture of iron it has always been, particularly fince the introduction of pit coal, the unceafing object of the iron-maker to improve his blowing apparatus; for uniformly he has found, that in proportion as he can raife air, and make it enter the furnace, fo will his weekly quantity of metal be increafed.

In the early hiftory of this intereting manufacture, when charcoal of wood was the matter of fuel made ufe of, the affinities betwixt the latter and the ore were eftablifhed with more facility. Small furnaces, called bloomeries, were fufficiently large, and deemed of profitable capacity, if they produced a bloom or two of iron per day, of 90 to 120lbs. each.

Hand bellows, and what were called fuel blafts, were fufficiently large for the minor operations. After the general introduction of the refinery furnaces, and the divifion of the manufacture into the making of pig iron, and the refining of this into bar or malleable iron, the advantages of a powerful blaft were immediately perceived. Water-wheels, working two pairs or more of leather bellows, were found to produce powerful effects, and, in confequence, almoft every fituation that prefented a command of materials and a waterfall, became the fcite of an iron-mill.

The fimple mode of blowing furnaces by means of a trompe, was at the fame time introduced; but in general it was found, that much greater advantage could be derived from the defcent of water upon a wheel, either as to denfity or quantity, than by means of the beft conftructed trompe.

The ufe of water wheels and leather bellows continued general throughout the iron bufinefs, until the principles and mechanifm of the fteam engine were eftablifhed upon unerring grounds. This wonderful invention was foon applied with the happieft effect in many fituations rich with mineral treafures, but to which nature had denied the advantage of water fufficient to turn machinery. Cylinders, compofed of wood, firmly jointed and hooped, were firft introduced as a fubftitute for leather bellows: thefe were foon after replaced by bored cylinders of caft iron; and with

with this great discovery and application of the art of casting, the blowing machine assumed a general and well-proportioned form.

This took place nearly 40 years ago, and continued with a few temporary deviations until the introduction of Bolton and Watt's highly improved engine. The following may serve for an outline of the old blowing steam engine.

A steam cylinder, working with atmospheric pressure from 3 to 7 lbs. upon every square inch of the area of the piston. The diameter of the cylinder for one furnace varied from 25 to 36 inches, and for two furnaces from 36 to 50 inches. Upon the opposite of the main or working beam, sometimes at equal, and sometimes at unequal distances from the centre, was placed the air-pump or blowing cylinder. This was, in common, equal to four or five times the area of the former; and, with the small working power of the steam cylinder, seldom condensed the air beyond $1\frac{1}{2}$ to $1\frac{3}{4}$ lbs. per square inch. The air-pump was commonly constructed open below, as may be seen in *Plate* II. *fig* 1. (*Chemistry.*) The plan was sometimes deviated from, and the cylinder inverted. The blowing piston was loaded with weights, and the air expressed by its descent. In this mode of working, the act of the steam piston, descending in vacuo raised the air-pump piston loaded with weights. Upon the return of the stroke, or while the steam piston ascended in the cylinder, this piston loaded with weights sunk the whole length of the stroke, and by means of this loading, proportioned to the powers of the engine, forced the air either into the regulator or the furnace.

Above, or parallel to the air-pump, was placed the regulating cylinder, as may be seen in the plate above mentioned. This had a valve of communication, which opened every stroke the engine made, and admitted the whole discharge of air. The piston of the cylinder, frequently called the fly piston, was loaded with weights, and kept constantly vibrating; so that when any deficiency of pressure arose from the remitting action of the air-pump piston, the blast was comparatively equalized by the pressure of the fly piston upon the included air. The size of this cylinder was generally in the proportion of 9 to 6 of the air-pump.

The chief objections to this mode of blowing, even when in universal use, were founded upon the great inequality of the blast, and a very considerable waste of air that took place at the *snort*, or safety valve, to prevent the fly piston being blown entirely out of the cylinder. The snort was an opening made in the top of the air-pump cylinder, on which rested a heavy iron valve, faced with leather stuffed with wool; this was, by means of an upright iron rod, attached to a lever, which run across the top of the regulating cylinder. As soon as the fly piston arose to a certain height, a block of wood, or other contrivance, lifted the one end of the lever, and along with it the valve, to a certain height, and permitted a quantity of the densest air to escape, sufficient to insure the safety of the piston. Notwithstanding these precautions, many accidents and stops ensued; the breaking of a pin, or the loosing of a key, frequently ejected the piston from its cylinder, though loaded with several tons of weight.

Some iron masters, more ingenious than others, contrived to take the spare or waste air from the snort, to receive it in an inverted chest above water, and blow to its extent smithy and finery fires. Endeavours of this kind to husband and economise air, raised and condensed at a great expence, were sufficient proofs that a method was still wanting to complete the blowing machine, to render its motions steady and uniform, and to equalize the density of the blast throughout the whole stroke.

This was completely accomplished by inverting large chests, or cylinders, in cisterns of wood, stone, or iron. The space betwixt the inner and outer cisterns was constructed of sufficient capacity to oppose to the expansive force of the blast a column of water of equal or superior resistance.

This invention was called the water blast, water pressure, water regulator, &c. The dimensions differed materially from each other; this circumstance being much regulated by conveniency, opinion, and the size of the engine.

Plate XIV. *fig.* 1. (*Chemistry*) represents a ground plan of a very capacious water regulator, sunk in the ground, and built of stone and bricks.

A, the inverted chest made of plates of cast iron, 40 feet long, 12 feet wide, and 12 feet high. The square superficies of this chest is equal to 480 feet, and its cubical contents are 5760 feet. Its weight will amount to nearly 30 tons.

B, the opening to which the air-pipe is attached; 2 feet diameter.

CCCC, open space betwixt the inverted chest and stone cistern, for the column of water to ascend; $3\frac{1}{2}$ feet wide.

DDDD, stone or brick-work, of which the great cistern is built. This work requires to be well jointed, as the motion of the water has a great tendency to open the spaces betwixt the stones. This cistern is 47 feet long, 19 feet broad, and 14 feet high; its cubical measurement amounting to 12,500 feet, and capable of containing 93,500 gallons wine measure.

eeee, an opening of one foot in breadth left in the middle of the building. This is compactly filled with well trod clay, called puddling, and prevents the escape or circulation of water through the building. Beyond this the common building extends to a sufficient thickness to give general security to the whole.

Fig. 2. is a cross section of the water regulator at B, *fig.* 1. The letters in this view correspond with those in the plan.

F, the blast pipe from the cylinder entering the chest, and branching to the two blast furnaces.

GG, large hewn stones, on which the chest is supported about two feet from the bottom of the cistern, at intervals of six feet from each other.

H, loading of hewn stone, which for this cistern requires to be equal in all to 90 tons. If the chest weighs 30, then 60 tons of loading will be requisite. This is supposing that the power of the blowing machine is calculated to press equal to 3 lbs. upon every square inch, which many of them are constructed to perform.

To comprehend distinctly in what manner the water regulator performs its functions, and upon the supposition that the compressing power of the engine is equal to 3 lbs. upon every square inch, we shall suppose the engine at rest, and water introduced into the regulator, till it rise to the level of the dotted line *h*, 5 feet from the lower edge of the chest, and 7 feet in total depth of water. As soon as the engine is set to work, the compression of the air immediately sets the water in motion; every stroke making the water rise in the space CC, and proportionally falling towards GG, in the interior of the chest.

When the inverted chest becomes filled with air, and the condensation has reached the maximum of the power of the blowing machine, the water will be found elevated $3\frac{1}{2}$ feet to *i*, and the gauge will exhibit a depression in the interior of the chest, from *h* to *k*, $3\frac{1}{2}$ feet, making in all 7 feet from *k* to *i*.

At every turn of the engine stroke the water maintained at *i* falls a few inches, and elevates itself above *k* in the in-

terior of the chest, a similar height. This description takes it for granted, that the spaces CC are equal to the area of the inverted chest; so that every inch of water forced out of the chest adds exactly one inch to the height of the column.

A blowing machine, capable of blowing to purpose two blast furnaces, ought to have the inverted chest of the regulator equal to three or four hundred square feet of area. There cannot arise any error from having this large enough; the want of space and capacity frequently proves a real detriment.

In calculating the proportions and dimensions of water regulators in general, the principle is, to allow the space around the inverted chest equal in point of superficial measurement to the area of the interior of the chest, that the descending column of water may displace no more in the perpendicular ascent, than it is itself absolutely depressed.

If the area or space in which the water rises and falls, is only equal to half the area of the inverted chest, then for every foot of water which is depressed in the bottom of the chest, a column of two feet will be raised and maintained on the outside. On the contrary, if the outside space for water be equal to twice the area, then every foot of water depressed in the chest will only elevate the external column six inches.

It will appear evident from these general facts, that a considerable latitude may at any time be assumed in constructing the water regulator, particularly in old established works, where local circumstances and conveniency confine its situation to one spot.

Where it is not inconvenient to use a high perpendicular column of water, the inverted chest may be increased one half, double, or even triple the superficial measurement of the outside space; so that if the power of the blowing machine is equal to 3 lbs upon the square inch, the water in the chest will be depressed $3\frac{1}{2}$ feet nearly, and raised in the perpendicular column 5 feet 3 inches in the first, 7 feet in the second, and $10\frac{1}{2}$ feet in the last case. This plan to suit former establishments may be adopted with considerable modifications, always keeping in mind, that every foot of area gained upon the surface of the water is a material acquisition to the equalizing powers of the regulator.

One imperfection attends this want of equilibrium on the two spaces for the action and re-action of the water.—Whatever space the waters would fall, at the return of the stroke, supposing the inside and outside columns exactly balanced, would in this case be increased one half, double, or triple.

Again, where situation does not admit of the perpendicular column being raised beyond, or not even to the extent of the depression, that takes place within the inverted chest, and where an additional space cannot be procured for an increase of its diameter, an inverted chest of much less height than common may be used, loaded with a material of great weight, such as iron. The water in that case would distribute itself over the surface of the chest, instead of rising in perpendicular height.

One serious objection, however, is made to chests or cylinders, where the eduction pipe approaches within a short space of the surface of the water; namely, water rising in the pipes, and being conveyed along with the air into the furnace. This may take place in two ways; by an insensible and uniform discharge of water into the furnace, making the blast at the tuyere visible, like the respiration of the human body in a frosty day; or in quantity, threatening utter destruction to the furnace and buildings. The former is occasioned by the air from the eduction pipe, at the commencement of the stroke, impinging violently upon the surface of the water, and raising a portion of it in the state of spray. This is speedily dissolved or entangled in the mass of condensed air before the return of the next stroke, and becomes expressed along with the blast into the furnace. The other hazardous consequence is occasioned chiefly by undulation in the column of water, when the blowing machine is, by derangement or accident, working under its proper power or number of strokes. In these cases, when the pause at the end of the stroke is prolonged, an exhaustion sometimes takes place in the air-pipes, the water rises and is carried in a stream through the blow-pipe into the furnace.

The same casualties may more readily occur, if the surface of the water is upon a level, or nearly so, with the tuyere.

In judicious erections this is most carefully avoided; the surface of water in the inverted chest or cylinder is kept at least 8, 9, and 10 feet under the level of the tuyere, even at the last period of return, when the water has risen to its greatest height within.

This very proper precaution ensures an advantage of much importance. A large space is obtained betwixt the top of the chest and the depressed surface of the water; this becomes a spacious reservoir for the condensed air, and, by generating a considerable portion of elasticity, prevents any violent perturbation upon the water at any period of the stroke. The increased distance betwixt the surface of the water, and the pipe which conducts the air from the cylinder, has a complete tendency to prevent the elevation of the aqueous particles, and always ensures a quantity of air comparatively free from moisture.

Upon the principles formerly noticed, it is possible to construct a blowing apparatus of this nature, wherein there could be little or no visible motion in the perpendicular column of water even with the same engine.

Let us suppose a machine of this nature at work, with an accurately balanced column of water, the fall of which, at the return of the stroke, was equal to 12 inches. It is evident, that if the outside space was enlarged so much over its surface as to contain this foot of water, without adding any perceptible height to the column; that included within the chest would, at the return of the stroke, being fed from a more capacious limb, rise a foot, without any sensible diminution taking place in the perpendicular height of the external fluid. It is equally obvious, in this as in every case with water regulators, that the rise and fall of the inside column of water will remain the same, under every modification and form, while the pace and powers of the engine remain the same.

The application of water regulators to blowing machines was soon followed by an attempt to further improvement, by the introduction of the air-vault; the principle of which was to form a receiver of such capacity, that the elasticity or spring of the condensed air would be sufficient to express and equalize the blast during the return of the stroke.

To effect this, an immense magazine was requisite; to erect which of any metallic substance would have been ruinously expensive, and, if constructed of wood, insufficient for retaining the air. It became therefore requisite to try the experiment upon building, or by excavation from the solid rock. In both these ways has the air-vault been tried, and found to produce an excellent effect, as to equalizing the density of the blast; but it has been conceived with such indifferent consequences as to quantity, that the plan is for the present given up.

Air-

Air-vaults were conſtructed both at the Clyde and Muirkirk iron works in Scotland, and a conſtant current of air produced; but nearly one half the quantity lifted by the air-pump eſcaped through the walls and arches of the building. This was at any time made viſible by rubbing ſoapy water upon the external walls.

At Devon iron works in Scotland, an air-vault was excavated from the ſolid rock, 72 feet long, 14 feet wide, and 13 feet high; equal to 13,000 feet of cubical meaſurement. This immenſe excavation was made comparatively air-tight, by cauking the ſeams and fiſſures of the rock, plaſtering and then covering the whole with alternate layers of pitch and cloſe wove paper.

This was the moſt perfect experiment ever tried upon the air-vault; and if an opinion is to be formed of the perfection of the apparatus by the quantity of iron at one time manufactured, a very trifling portion of air indeed muſt have been loſt.

It has been frequently noticed in Scotland, that at works where the materials were in any degree ſimilar, 3000 to 3500 cubical feet of air per minute will, in the courſe of a week, produce from 30 to 35 tons of pig iron, whatever may be the denſity at which it is thrown into the furnace.

The Devon furnace at one time averaged 33 tons weekly for 9 months running, and conſumed of air, per data furniſhed by Mr. Roebuck in his paper publiſhed in Nicholſon's Journal, vol. iv. nearly 3400 cubical feet per minute, under a preſſure of $2\frac{3}{4}$ lbs. per ſquare inch. Notwithſtanding this powerful demonſtration, ſtrong prejudices were entertained to its diſadvantage; and many believed, that had any other mode of regulator been attached to the blowing machine, abundance of air would have been obtained to have blown two furnaces equally well. That this idea was incorrect, may be eaſily gathered by calculation from the area of the air-pump, the length of the working ſtroke, and the number of ſtrokes per minute, all of which are particularly ſtated by Mr. Roebuck.

For the general conſtruction of an air-vault formed by building, ſee *Plate* XV. (*Chemiſtry*.)

Fig. 1. is a ſection of the vault conſtructed under the bridge-houſe, or place where the materials are proportioned, previouſly to their being thrown into the furnace. One half a blaſt furnace outline, is ſeen as connected in point of ſituation and blaſt to the air magazine.

A, the termination of the blaſt pipes that convey the air from the blowing cylinder into the receiver, 3 feet diameter; the length depends upon the contiguity of the engine to the vault.

B B B B, four vaults, 13 feet wide each, 25 feet deep, and 10, 11, 12, and 13 feet high to the ſpringing of the arches; total height to the crown of the arches, $16\frac{1}{2}$, $17\frac{1}{2}$, $18\frac{1}{2}$, and $19\frac{1}{2}$ feet. Theſe cells communicate with each other by arched openings in the croſs-walls, which may be diſtinctly ſeen in the ground plan at L.

C C, the eduction pipes that carry the air to the furnace; 18 inches diameter.

D, end view of the range of laying pipes at the tuyere of the furnace. The dotted lines betwixt D and C are meant to repreſent the horizontal range of the pipes.

E, part of the outline of a blaſt furnace to ſhew its proper ſituation to the air vault.

F F F F, floor of the reſpective vaults, compoſed of a mixture of two parts of boring duſt, two of fine riddled lime, and one part of fine roaſted iron ſtone, mixed up into plaſter with water containing a conſiderable portion of ſalt.

G G, end walls of bricks or ſtone, four feet thick.

H H H, lining of brick-work, built in the moſt accurate manner, with fine riddled mortar, and run every ſecond or third courſe with mortar made thin and very liquid. Theſe walls are two feet and a half in thickneſs, are carefully plaſtered, and afterwards covered with ſeveral layers of ſtrong paper and pitch, to prevent the eſcape of air. The roofs of the vaults are finiſhed in the ſame manner.

I, door arch into the vaults; entrance obtained by means of a ladder or wooden ſtairs ſuſpended within.

K, ſpace above the arches, filled with rubbiſh, to prevent any ſpring, and to raiſe the floor to the level of the furnace top.

L, the range of the floor, or acclivity to the furnace mouth.

Fig. 2. is a ground plan of the bridge-houſe containing the air-vaults, and exhibits one half the ground plan of the furnace through the centre of the tuyere arches.

B B B B, correſponding to the ſame letters in the elevation.

C C, pipes for taking off the blaſt into the furnace.

D, correſponding to the ſame letter in the ſection.

E, main pillar of the furnace, ſame as E in the ſection.

G G G G, and H H H, correſpond with the ſame letters in the elevation.

I, ſquare for receiving the furnace hearth.

K, part of the ground view of the hearth, and the approaching blaſt pipes.

L L L, openings of the croſs arches, which communicate the vaults with each other.

The cubical contents of a vault conſtructed according to theſe dimenſions, will amount to 20,000 feet.

In general, it may be remarked upon the conſtruction of the blowing machine, that ſince the period of the introduction of Mr. Watt's engine, the air-pump, or blowing cylinder, has been conſtructed ſo as to diſcharge a cylinder full of air every aſcent and deſcent of the piſton. This, inſtead of travelling 4 to 5 feet per ſtroke, more generally moves 8 feet; and the number of cylinders per minute are ſeldom under 24.

Formerly, in the common atmoſpheric engine, the movement of the piſton from top to bottom, and back again, produced only one cylinder full of air from the air-pump, and the number of cylinders diſcharged per minute ſeldom exceeded 16. A ſteam cylinder of 40 to 44 inches diameter, and an air-pump of 6 feet diameter, the piſton moving about 5 feet per ſtroke, were deemed ſufficient in the conſtruction of a blowing machine for two blaſt furnaces. The quantity of air pumped up and thrown into the furnaces by ſuch an engine ſeldom exceeded 3000 cubical feet per minute. This, and even a larger quantity, is now thrown into one furnace, and the produce by ſuch means increaſed from 15 to 35 tons weekly.

The firſt ſet of tables following are calculated to ſhew the quantity of air that would be diſcharged by blowing cylinders of various diameters, the length and number of the ſtrokes being given.

The ſecond ſet, to ſhew what diameter of blowing cylinder is requiſite, with a given ſteam power, to raiſe the air to a certain denſity per ſquare inch. See ENGINE, WATER REGULATOR, and REGULATING VAULT.

BLOWING.

TABLE I. of Blowing Cylinders, their Capacity, Area, and Quantity of Air discharged by a Four-Feet Stroke, &c.

Diameter in Inches.	Area in Circular Inches.	Area in Square Inches.	Capacity of the Stroke in Cubic Feet.	Air discharged at the Rate of 50 Cylinders per Minute.	Air discharged at the Rate of 40 Cylinders per Minute.	Air discharged at the Rate of 30 Cylinders per Minute.	Air discharged at the Rate of 25 Cylinders per Minute.	Air discharged at the Rate of 20 Cylinders per Minute.	Air discharged at the Rate of 15 Cylinders per Minute.	Air discharged at the Rate of 12 Cylinders per Minute.	Air discharged at the Rate of 10 Cylinders per Minute.
36	1296	1017.8784	28.2744	1413.7200	1130.9760	848.2320	706.8600	565.4880	424.1160	339.2928	282.7440
37	1369	1075.8670	29.8670	1493.3500	1194.6800	896.0100	746.6750	592.3400	448.0050	358.4040	298.6700
38	1444	1134.1176	31.5032	1575.1600	1260.1280	945.0960	787.5800	630.1280	472.5480	378.0384	315.0320
39	1521	1194.5934	33.1831	1659.1550	1327.3240	995.4930	829.5775	663.6620	497.7465	398.1972	331.8310
40	1600	1256.6400	34.9055	1745.2750	1396.2200	1047.1650	872.6375	698.1100	523.5825	418.8650	349.0550
41	1681	1320.2574	36.6738	1833.6900	1466.9520	1100.2140	916.8450	733.4760	550.1020	440.0856	366.7380
42	1764	1385.4456	38.4834	1924.1700	1539.3360	1154.5020	962.0850	769.6680	577.2510	461.8008	384.8340
43	1849	1452.2046	40.3390	2016.9500	1613.5600	1210.1700	1008.4750	806.7800	605.0850	484.0680	403.3900
44	1936	1520.5344	42.2370	2111.8500	1689.4800	1267.1100	1055.9250	844.7400	633.5550	506.8440	422.3700
45	2025	1590.4350	44.1787	2208.9350	1767.1480	1325.3610	1104.4765	883.5740	662.6805	530.1444	441.7870
46	2116	1661.9064	46.1640	2308.2090	1846.5600	1384.9200	1154.1000	923.2800	692.4600	553.9680	461.6400
47	2209	1734.9480	48.1930	2409.6500	1927.7200	1445.7900	1204.8750	963.3600	772.8950	578.3160	481.9300
48	2304	1809.5616	50.2656	2513.2800	2010.6240	1507.9680	1256.6400	1005.3120	753.9840	603.1872	502.6560
49	2401	1885.7545	52.3818	2619.0900	2095.2720	1571.4540	1309.5450	1047.6360	785.7270	628.5816	523.8180
50	2500	1963.5000	54.5416	2727.0800	2181.6640	1636.2480	1363.5400	1090.8320	818.1240	654.4992	545.4160
51	2601	2042.8254	56.7451	2837.2550	2269.8040	1702.3530	1418.6275	1134.9020	851.1760	680.9412	567.4510
52	2704	2123.7216	58.9644	2948.2200	2358.5760	1768.9320	1474.1100	1179.2800	884.4600	707.5728	589.6440
53	2809	2206.1886	61.2830	3064.1500	2451.3200	1838.4900	1532.0750	1220.6600	919.2450	735.3060	612.8300
54	2916	2290.2264	63.6173	3180.8650	2544.6920	1908.5190	1590.4327	1272.3410	954.2595	763.4076	636.1730
55	3025	2375.8350	65.9954	3299.7700	2639.8160	1979.8620	1649.8850	1319.9080	989.9310	791.9448	659.9540
56	3136	2463.0144	68.4017	3420.5350	2736.4280	2052.3210	1710.2675	1363.2140	1026.1605	820.9284	684.1070
57	3249	2551.7646	70.8823	3544.1150	2835.2920	2126.4690	1772.0575	1417.6460	1063.2345	850.5876	708.8230
58	3364	2642.0856	73.3913	3669.5650	2935.6520	2201.7390	1834.7825	1467.8260	1100.8695	880.6956	733.9130
59	3481	2733.9774	75.9438	3797.1900	3037.7520	2278.3140	1898.5950	1518.8760	1139.1520	911.3256	759.4380
60	3600	2827.4400	78.5400	3927.0000	3141.6000	2356.2000	1963.5000	1570.8000	1178.1000	942.4800	785.4000
61	3721	2922.4734	81.1798	4058.9900	3247.1920	2435.3740	2029.9950	1623.5960	1217.6870	974.1576	811.7980
62	3844	3019.0776	83.8632	4193.1500	3354.5280	2515.8960	2096.5750	1677.2640	1257.9480	1006.3584	838.6320
63	3969	3117.2526	86.5703	4325.3650	3462.8120	2597.1090	2162.6425	1731.4060	1298.5545	1038.8436	865.7030
64	4096	3216.9984	89.3332	4466.6600	3573.3280	2679.9960	2233.3300	1786.6640	1339.9980	1071.9984	893.3320
65	4225	3318.3150	92.1754	4608.7200	3687.0160	2765.2 20	2304.3600	1843.5080	1382.6300	1106.0848	921.7540
66	4356	3421.2024	95.0334	4751.6700	3801.3360	2850.9020	2375.8350	1900.1680	1425.4510	1140.4008	950.0840
67	4489	3525.6606	97.9350	4896.7500	3917.4000	2938.0500	2448.3750	1958.7000	1469.0250	1175.2200	979.3500
68	4624	3631.6896	100.8802	5044.0100	4035.2080	3026.4060	2552.0050	2017.6040	1513.2030	1210.5624	1008.8020
69	4761	3739.2894	103.8691	5193.4550	4154.7640	3116.0730	2596.7275	2077.3800	1558.0365	1246.4292	1038.6900
70	4900	3848.4600	106.9017	5345.0850	4276.0680	3207.0510	2672.5425	2138.0340	1603.5255	1282.8204	1069.0170
71	5041	3959.2014	109.9778	5498.8000	4399.1120	3299.3340	2749.4450	2199.5560	1649.6620	1319.7336	1099.7780
72	5184	4071.5136	113.0976	5654.8800	4523.9040	3392.9280	2827.4400	2261.9520	1696.4640	1357.1512	1130.9760
73	5329	4185.3966	116.2610	5813.0500	4650.4400	3487.8300	2906.5250	2325.2200	1743.9150	1395.1320	1162.6000
74	5476	4300.8504	119.4680	5973.4000	4778.7200	3584.0400	2986.7000	2389.3600	1792.0200	1433.6160	1194.6800
75	5625	4417.8750	122.7187	6135.9350	4908.7480	3681.5610	3067.9675	2454.3740	1840.7805	1472.6244	1277.1870
76	5776	4536.4704	126.0130	6301.5500	5040.5200	3780.3900	3150.7750	2520.2000	1890.1950	1512.1560	1260.1300
77	5929	4656.6366	129.3232	6466.1600	5172.9280	3879.6960	3233.0800	2586.4640	1939.8480	1551.8784	1293.2320
78	6084	4778.3736	132.7326	6633.6300	5309.3040	3981.9780	3316.8150	2654.6520	1990.4890	1592.7912	1327.3760
79	6241	4901.6814	136.1578	6807.8900	5446.3120	4084.7340	3403.9450	2723.1560	2042.3670	1633.8936	1366.5780
80	6400	5026.5600	139.6266	6981.3300	5585.0640	4188.7980	3490.6650	2792.5320	2094.3990	1675.5192	1396.2660
81	6561	5153.0094	143.1391	7156.9550	5725.5640	4294.1730	3578.4775	2862.7820	2147.0865	1717.6692	1431.3910
82	6724	5281.0296	146.6952	7334.7600	5867.8080	4400.8560	3667.3800	2938.9040	2200.4280	1760.3424	1469.4520
83	6889	5410.6206	150.2950	7514.7500	6011.8000	4508.8500	3757.3750	3055.4000	2254.4250	1803.5400	1527.7000
84	7056	5541.7824	153.9386	7696.9300	6157.5440	4618.1580	3848.4650	3078.7720	2309.0790	1847.5048	1539.8860
85	7225	5674.5150	157.6254	7881.2700	6305.0160	4728.7620	3940.6350	3152.5080	2364.3810	1891.5048	1576.2540
86	7396	5808.8184	161.3560	8067.8000	6453.2400	4840.6800	4033.9000	3226.6200	2420.3400	1936.2720	1613.3100
87	7569	5944.6926	165.1303	8256.5150	6605.2120	4953.9090	4128.2575	3302.6060	2476.9545	1981.5636	1651.3030
88	7744	6082.1376	168.9482	8447.4100	6757.9280	5068.4460	4223.7050	3378.9640	2534.2230	2027.3784	1689.4820
89	7921	6221.1534	172.8098	8540.4900	6912.3920	5184.2940	4270.2450	3456.1960	2592.1470	2073.7186	1728.0980
90	8100	6361.7400	176.7150	8835.7500	7068.6000	5301.4500	4417.8750	3534.3000	2650.7250	2120.5800	1767.1500
91	8281	6503.8974	180.6638	9033.1900	7226.5520	5419.9140	4516.5950	3613.2760	2709.9570	2167.9656	1806.6380
92	8464	6647.6256	184.6562	9232.8100	7386.2480	5539.6860	4616.4550	3693.1240	2769.8430	2264.3076	1846.0620
93	8649	6792.9246	188.6923	9434.6150	7547.6920	5660.7690	4717.3075	3773.8460	2830.3845	2313.2640	1886.4230
94	8836	6939.7944	192.7720	9638.6000	7709.8800	5783.1600	4819.3000	3854.9400	2891.5800	2362.7448	1927.4700
95	9025	7088.2350	196.8954	9844.7700	7875.8160	5906.8620	4922.3850	3937.9080	2953.4310	2412.7512	1968.9540
96	9216	7238.2464	201.0626	10053.1300	8042.5040	6031.8780	5026.5650	4021.2520	3015.9390	2463.2760	2010.6260
97	9409	7389.8286	205.2730	10263.6500	8210.9200	6158.1900	5131.8250	4105.4600	3079.0950	2514.3254	2002.7300
98	9604	7542.9816	209.5272	10476.3600	8381.0880	6285.8160	5238.1800	4190.5440	3147.9080	2565.9012	2095.2720
99	9801	7697.7054	213.8251	10691.2550	8553.0040	6414.7530	5345.6275	4276.5020	3207.3765	2615.8744	2138.2510
100	10000	7854.0000	218.1666	10908.3300	8726.6640	6544.9980	5454.1650	4363.3320	3272.4990	2667.9992	2181.6669

BLOWING.

TABLE II. of Blowing Cylinders, their Area, Capacity, and Quantity of Air, discharged by a Five-Feet Stroke.

Diameters of Cylinders.	Area in Circular Inches.	Area in Square Inches.	Capacity of the stroke in Cubical Feet.	Air discharged at the Rate of 50 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 40 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 30 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 25 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 20 Cylinders per Minute in Cubical Feet	Air discharged at the Rate of 15 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 12 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 10 Cylinders per Minute in Cubical Feet.
36	1296	1017.8784	35.3430	1767.1500	1413.7210	1060.2900	883.5750	706.8605	530.1450	424.1160	353.4302
37	1369	1075.8670	37.3337	1866.6850	1493.3480	1120.0110	933.3425	746.6740	560.0005	448.0044	373.3370
38	1444	1134.1176	39.3790	1968.9500	1575.1600	1181.3700	984.4750	787.5800	590.6850	472.5480	393.7900
39	1521	1194.5984	41.4788	2073.9400	1659.1520	1244.3640	1036.9700	829.5760	622.1820	497.7456	414.7880
40	1600	1256.6400	43.6319	2181.5950	1745.2760	1308.9570	1090.2975	872.6380	654.4785	523.5828	436.3190
41	1681	1320.2574	45.8422	2292.1100	1833.6880	1375.2660	1146.0550	916.3440	687.6330	550.1064	458.1720
42	1764	1385.4456	48.1042	2405.2100	1924.1680	1443.1260	1202.6050	962.0840	721.5630	577.2504	481.0420
43	1849	1452.2046	50.4237	2521.1850	2016.9480	1512.7110	1260.5925	1008.4740	756.3550	605.0844	504.2370
44	1936	1520.5344	52.7962	2639.8100	2111.8480	1583.8860	1319.9050	1055.9240	796.9430	633.5544	527.9620
45	2025	1590.4350	55.2233	2761.1650	2208.9320	1656.6990	1380.5825	1104.4660	828.3495	662.6796	552.2330
46	2116	1661.9064	57.7050	2885.2500	2308.2000	1731.1500	1442.6250	1154.1000	865.5750	692.4600	577.0500
47	2209	1734.9486	60.2412	3012.0600	2409.6480	1807.2360	1506.0300	1204.8240	903.6180	722.8944	602.4120
48	2304	1809.5616	62.8320	3141.6000	2513.2800	1884.9600	1570.8000	1256.6400	942.4800	753.9840	628.3200
49	2401	1885.7545	65.4772	3273.8600	2619.0880	1964.3160	1636.4300	1309.5440	982.1580	785.7264	654.7720
50	2500	1963.5000	68.1770	3408.8500	2727.0800	2045.3100	1704.4250	1363.5400	1022.6550	818.1240	681.7700
51	2601	2042.8254	70.9313	3546.5650	2837.2520	2127.9390	1773.2825	1418.6260	1013.9695	851.1756	709.3130
52	2704	2123.7216	73.7055	3685.2750	2948.2200	2211.1650	1842.6375	1474.1100	1105.5825	884.4660	737.0550
53	2809	2206.1886	76.6037	3830.1850	3064.1480	2298.1110	1915.0925	1532.0740	1149.0550	919.2444	761.0370
54	2916	2290.2264	79.5216	3976.0800	3180.8640	2385.6480	1988.0400	1590.4320	1192.8240	954.2592	795.2160
55	3025	2375.8350	82.4942	4124.7100	3299.7680	2474.8260	2062.3550	1649.8840	1237.4130	989.9304	824.9420
56	3136	2463.0144	85.5021	4275.1050	3420.0840	2565.0630	2137.5525	1710.0420	1282.5315	1026.0242	855.0210
57	3249	2551.7646	88.6028	4430.1400	3544.1120	2658.0840	2215.0700	1772.0560	1329.0420	1063.2336	886.0280
58	3364	2642.0856	91.7391	4586.9550	3669.5640	2752.1730	2293.4775	1834.7820	1376.0865	1100.8692	917.3910
59	3481	2733.9774	94.9297	4746.4850	3797.1880	2847.8910	2373.2425	1898.5940	1423.9455	1139.1564	949.2970
60	3600	2827.4400	98.1750	4908.7500	3927.0000	2945.2500	2454.3750	1963.5000	1472.6250	1178.1000	981.7500
61	3721	2922.4734	101.4747	5073.7350	4058.9880	3044.2410	2536.8675	2029.4940	[illegible]	[illegible]	[illegible]
62	3844	3019.0776	104.8290	5241.4500	4193.1600	3144.8700	2620.7250	2096.5800	1572.4350	1257.9480	1048.2900
63	3969	3117.2526	108.2128	5410.6400	4328.5120	3246.3840	2705.3200	2164.2560	1623.1920	1298.5536	1082.1280
64	4096	3216.9984	111.6665	5583.3250	4466.6600	3349.9950	2791.6125	2233.3300	1674.9975	1339.9980	1116.6650
65	4225	3318.3150	115.2192	5760.9600	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
66	4356	3421.2024	118.7927	5939.6350	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
67	4489	3525.6606	122.4187	6120.9350	4896.7480	3672.5610	3060.4675	2498.3740	1826.2805	1469.0244	1249.1870
68	4624	3631.6896	126.1002	6305.0100	5044.0080	3783.0060	3152.5050	2522.0040	1891.5030	1513.2024	1261.0020
69	4761	3739.2894	129.8363	6491.8150	5193.4520	3895.0890	3245.9075	2596.7260	1947.5445	1558.0356	1298.3630
70	4900	3848.4600	133.6271	6681.3550	5345.0840	4008.8130	3340.6775	2672.5420	2004.4065	1603.5252	1336.2710
71	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
72	5184	4071.5136	141.3720	7068.6000	5654.8800	4241.1600	3534.3000	2827.4400	2120.5800	1696.4640	1413.7200
73	5329	4185.3960	145.3262	7266.3100	5813.0480	4359.7860	3633.1550	2906.5240	2179.8930	1743.9144	1453.2620
74	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
75	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
76	5776	4536.4704	157.5162	7875.8100	6300.6480	4725.4860	3937.9052	3150.3240	2367.7430	1890.1944	1575.1620
77	5929	4656.6366	161.6540	8082.7000	6466.1600	4849.6200	4041.3500	3233.0800	2424.8100	1939.8480	1616.5400
78	6084	4778.3736	165.9157	8295.7850	6636.6280	4977.4710	4147.8925	3318.3140	2488.7350	1990.9874	1659.1570
79	6241	4901.6814	170.1972	8509.8600	6807.8880	5105.9160	4254.9300	3403.9440	2552.9580	2042.3664	1701.9720
80	6400	5026.5600	174.5332	8726.6600	6981.3280	5235.9960	4363.3300	3490.6640	2667.9980	2094.3984	1745.3320
81	6561	5153.0094	178.9238	8946.1900	7156.9520	5367.7140	4473.0950	3578.4760	2683.8570	2147.0856	1789.2380
82	6724	5281.0296	183.3690	9163.4500	7334.7600	5501.0700	4584.2250	3667.3800	2750.5350	2200.4280	1833.6900
83	6889	5410.6200	187.8697	9393.4350	7514.7480	5636.0160	4696.7175	3757.3740	2818.0305	2254.4244	1878.6870
84	7056	5541.7824	192.4232	9621.1600	7696.9280	5772.6960	4810.5800	3848.4640	2886.3480	2309.0784	1924.2320
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
88	7744	6082.1376	211.1852	10559.2600	8447.4080	6335.5560	5279.6300	4223.7540	3167.7780	2534.2224	2111.8770
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
90	8100	6361.7400	220.8937	11044.6850	8835.7480	6626.8110	5522.3425	4417.8740	3313.4055	2650.7244	2208.9370
91	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
93	8649	6792.9240	235.8653	11793.2650	9434.6120	7075.9590	5896.6325	4717.3060	3587.9795	830.3836	2358.6530
94	8836	6939.7944	240.9560	12047.8000	9638.2400	7228.6800	6023.9000	4819.1200	3614.3400	2891.4720	2409.5600
95	9025	7088.2250	246.1187	12305.9350	9844.7480	7383.5610	6152.9675	4922.3740	3691.7805	2953.4240	2461.3740
96	9216	7238.2464	251.3282	12566.4100	10053.1280	7539.8460	6283.2050	5026.5640	3761.9230	3015.9384	2513.2820
97	9409	7389.8280	256.5912	12829.5600	10263.6480	7697.7360	6414.7800	5131.8240	3848.8680	3079.0944	2565.9120
98	9604	7542.9816	261.9090	13095.4500	10476.3600	7857.5700	6547.7250	5238.6800	3928.7850	3142.9080	2619.3400
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
100	10000	7854.0000	272.7080	13635.4100	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE III. of Blowing Cylinders, their Area, Capacity, and Quantity of Air discharged by a Six-Feet Stroke.

Diameter in Inches.	Area in Square Inches.	Area in Square Inches.	Capacity of the Stroke in Cubical Feet.	Air discharged at the Rate of 50 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 40 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 30 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 25 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 20 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 15 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 12 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 10 Cylinders per Minute in Cubical Feet.
36	1296	817.8784	42.4116	2120.5800	1696.4640	1272.3480	1060.2900	848.2320	636.1740	508.9392	424.1160
37	1369	1075.8670	44.8005	2240.0250	1792.0200	1344.0150	1120.0125	896.0100	672.0075	537.6060	448.0050
38	1444	1134.1176	47.2548	2362.7400	1890.1920	1417.6440	1181.3700	945.0960	708.8220	567.0576	472.5480
39	1521	1194.5934	49.7746	2488.7300	1990.9840	1493.2380	1244.3650	995.4920	746.6190	597.2952	497.7460
40	1600	1256.6400	52.3582	2617.9100	2094.3280	1570.7460	1308.9550	1047.1640	785.3730	628.2986	523.5820
41	1681	1320.2574	55.0107	2750.5350	2200.4280	1650.3210	1375.2675	1100.2140	825.1605	660.1284	550.1070
42	1764	1385.4456	57.7.51	2886.2550	2309.0040	1731.7530	1443.1275	1154.5020	865.8765	692.7012	574.2510
43	1849	1452.2046	60.5085	3025.4250	2420.3400	1815.2550	1512.7125	1210.1740	907.6275	726.1020	605.0870
44	1936	1520.5341	63.3555	3167.7750	2534.2200	1900.6650	1583.8875	1267.1100	950.3325	760.2660	638.5500
45	2025	1590.4350	66.2680	3313.4000	2650.7200	1988.0409	1656.2000	1325.3600	999.0200	795.1960	662.6800
46	2116	1661.9064	69.2460	3462.3000	2769.8400	2077.3800	1731.1500	1384.4200	1038.6900	830.9520	692.2100
47	2209	1734.9486	72.2895	3614.4750	2891.5800	2168.6850	1807.2375	1445.2900	1084.3425	867.4740	722.6450
48	2304	1809.5616	75.3984	3769.9200	3015.9360	2261.9520	1884.9600	1507.9680	1130.9760	904.7808	753.9840
49	2401	1885.7545	78.5727	3928.6350	3142.9080	2357.1810	1964.3175	1571.4540	1178.5950	942.8724	785.7270
50	2500	1963.5000	81.8124	4090.6200	3272.4960	2454.3720	2045.3100	1636.4980	1227.6860	981.7488	818.2490
51	2601	2042.8254	85.1176	4255.8800	3404.7040	2553.5280	2127.9400	1702.3520	1276.7640	1024.4112	851.1760
52	2704	2123.7216	88.4466	4422.3300	3537.8640	2653.3980	2211.1650	1768.9320	1326.6940	1061.3592	884.4660
53	2809	2206.1886	91.9246	4596.2300	3676.9840	2757.7380	2298.1150	1838.4920	1378.8690	1103.0952	919.4920
54	2916	2290.2264	95.4259	4771.2950	3817.0360	2862.7770	2385.6475	1908.5180	1431.3885	1143.1108	954.2590
55	3025	2375.8350	98.9931	4949.6550	3959.7240	2969.7930	2474.8275	1979.8620	1484.8965	1187.9172	989.9310
56	3136	2463.0144	102.6025	5130.1250	4104.1000	3078.0750	2565.0625	2052.0500	1539.0375	1231.2300	1026.0250
57	3249	2551.7646	106.3234	5316.1700	4252.9360	3189.7020	2658.0850	2126.4680	1594.3510	1275.8604	1063.2340
58	3364	2642.0856	110.0869	5504.3450	4402.7560	3302.6070	2752.1725	2201.3780	1651.3035	1321.0428	1100.8690
59	3481	2733.9774	113.9157	5695.7850	4556.6280	3417.4710	2847.8925	2278.3140	1708.7355	1366.9884	1139.1570
60	3600	2827.4400	117.8100	5890.5000	4712.4000	3534.3000	2945.2500	2356.2000	1767.1500	1413.7200	1178.1000
61	3721	2922.4734	121.7697	6088.4850	4870.7800	3653.0910	3044.2425	2435.3900	1826.5450	1461.2364	1217.6950
62	3844	3019.0776	125.7948	6289.7400	5031.7920	3773.8440	3144.8700	2515.8960	1886.9220	1509.5376	1257.9480
63	3969	3117.2526	129.8544	6492.7200	5194.1640	3895.0320	3246.3600	2592.0820	1947.8160	1558.2528	1296.0410
64	4096	3216.9984	133.9998	6699.9900	5359.9920	4019.9940	3349.9950	2679.9960	2009.9970	1609.9576	1339.9980
65	4225	3318.3150	138.2631	6913.1550	5530.5220	4147.8930	3456.5750	2765.2620	2073.9465	1659.1572	1382.6310
66	4356	3421.2024	142.5501	7127.5050	5702.0040	4276.5030	3563.7525	2851.0020	2138.2515	1710.6012	1425.5010
67	4489	3525.6606	146.9025	7345.1250	5876.1000	4407.0750	3672.5625	2938.0500	2203.5375	1762.8300	1469.0250
68	4624	3631.6896	151.3203	7566.0150	6052.8120	4539.6090	3783.0075	3026.4060	2269.8045	1815.8436	1513.2030
69	4761	3739.2894	155.8036	7790.1800	6232.1440	4674.1080	3895.0900	3116.0720	2337.0540	1869.6432	1558.0360
70	4900	3848.4600	160.3525	8017.6250	6414.1000	4810.5750	4008.8125	3207.0500	2405.2875	1924.2300	1603.5250
71	5041	3959.2014	164.9667	8248.3350	6598.6680	4949.0010	4124.1675	3299.3340	2474.5050	1979.6004	1649.6670
72	5184	4071.5136	169.6464	8482.3200	6785.8560	5089.3920	4241.1600	3392.9280	2544.6960	2035.7568	1696.4640
73	5329	4185.3966	174.3915	8719.5750	6975.6600	5231.7450	4359.7875	3487.8300	2615.8725	2092.6980	1743.9150
74	5476	4300.8504	179.2020	8960.1000	7168.0800	5376.0600	4480.0500	3584.0400	2688.0300	2150.4240	1792.0200
75	5625	4417.8750	184.0780	9203.9000	7363.1200	5522.3400	4601.9500	3681.5600	2761.1700	2208.9360	1840.7800
76	5776	4536.4704	189.0195	9450.9750	7560.7800	5670.5850	4725.4875	3780.3900	2835.2925	2268.2340	1890.1950
77	5929	4656.6366	193.9848	9699.2400	7759.3920	5819.5440	4849.6200	3879.6960	2909.7720	2327.8176	1939.8480
78	6084	4778.3736	199.0989	9954.9900	7963.9560	5972.9670	4977.4745	3981.9780	2986.4835	2389.1868	1990.9890
79	6241	4901.5814	204.2367	10211.8350	8169.4680	6127.1010	5105.9175	4084.7340	3063.5505	2450.8404	2017.3670
80	6400	5026.5600	209.4399	10471.9950	8377.5960	6283.1970	5235.9975	4188.7980	3141.5985	2513.2788	2094.3990
81	6561	5153.0094	214.7086	10735.4300	8588.3440	6441.2580	5367.7150	4294.1720	3220.1290	2576.5032	2147.0860
82	6724	5281.0296	220.0428	11002.1400	8801.7120	6601.2840	5501.0700	4400.3560	3300.6420	2640.5136	2200.1780
83	6889	5410.6206	225.4425	11272.1250	9017.7000	6763.2750	5636.0625	4508.8500	3381.6375	2705.3100	2254.4250
84	7056	5541.7824	230.9076	11545.3950	9236.3160	6927.2370	5772.6975	4618.1580	3463.6185	2770.8948	2309.0790
85	7225	5674.5150	236.4381	11821.9050	9457.5240	7093.1430	5910.9525	4728.7620	3546.5715	2837.2572	2364.3810
86	7396	5808.8184	242.0340	12101.7000	9681.3600	7261.0200	6050.8500	4840.6800	3630.5100	2904.4080	2420.3900
87	7569	5944.6926	247.6954	12384.7700	9907.8160	7430.8620	6192.3850	4953.9080	3715.4310	2972.3448	2477.8540
88	7744	6081.1376	253.4223	12671.1150	10136.8920	7602.6690	6335.5575	5068.4460	3801.3345	3041.0676	2534.2230
89	7921	6221.1534	259.2147	12960.7350	10368.5880	7776.4410	6480.3675	5184.2940	3888.2205	3110.5764	2592.1470
90	8100	6361.7400	265.0725	13253.6250	10602.9000	7952.1750	6626.8125	5301.4500	3976.0875	3180.8700	2650.7250
91	8281	6503.8974	270.9957	13549.7850	10839.8280	8129.8710	6774.8925	5419.9140	4064.9355	3251.9484	2709.9570
92	8464	6647.6252	276.9843	13849.2150	11079.3720	8309.5290	6924.6075	5539.6860	4154.7645	3323.8116	2769.8430
93	8649	6792.9246	283.0384	14151.9200	11321.5360	8491.1520	7075.9600	5660.7680	4245.5760	3396.4608	2830.3840
94	8836	6939.7944	289.1580	14457.9000	11566.3200	8674.7400	7228.4500	5783.1600	4337.3700	3469.8960	2891.5800
95	9025	7088.2350	295.3431	14767.1550	11813.7240	8860.2930	7383.5750	5906.8620	4430.1465	3544.1172	2953.4310
96	9216	7238.2464	301.5936	15079.6950	12063.7560	9047.8170	7539.8475	6031.8780	4523.9085	3619.1268	3015.9390
97	9409	7389.7542	307.9095	15395.4750	12316.3800	9237.2850	7697.7375	6158.1900	4618.6475	[illegible]	[illegible]
98	9604	7542.7350	314.3906	15715.0400	12572.0320	9429.0240	7857.5200	6286.0160	4714.5120	3771.6096	3143.0080
99	9801	7697.2034	320.7376	16036.8800	12829.5040	9622.1280	8018.4400	6414.7520	4811.0640	3848.8512	3207.3760
100	10000	7854.0000	327.2500	16362.4950	13089.9960	9817.4970	8181.2475	6544.9980	4908.7485	3926.9988	3272.4990

TABLE IV. of Blowing Cylinders, their Area, Capacity, and Quantity of Air discharged by a Seven-Feet Stroke.

Diameter of Cylinder.	Area in Circular Inches.	Area in Square Inches.	Capacity of the Stroke in Cubical Feet.	Air discharged at the Rate of 50 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 40 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 30 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 25 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 20 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 15 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 12 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 10 Cylinders per Minute in Cubical Feet.
36	1296	1017.8784	49.4702	2473.5100	1978.8080	1484.1060	1236.7550	989.4040	742.0530	593.6424	494.7020
37	1369	1075.8670	52.2672	2613.3600	2090.6880	1568.0160	1306.6800	1045.3440	784.0080	627.2064	522.6720
38	1444	1134.1176	55.1386	2756.5300	2205.2240	1653.9180	1378.2650	1102.6120	826.9590	661.5672	551.3060
39	1521	1194.5934	58.0705	2903.5250	2322.8200	1742.1150	1451.7625	1161.4100	871.0575	696.8460	580.7050
40	1600	1256.6400	61.0848	3054.2250	2443.3800	1832.5350	1527.1125	1221.6900	916.2675	733.0140	610.8450
41	1681	1320.2574	64.1791	3208.9550	2567.1640	1925.3770	1604.4775	1283.5820	962.6865	770.1492	641.7910
42	1764	1385.4416	67.3459	3367.2950	2693.8360	2020.3770	1683.6475	1346.9180	1010.1885	808.1505	673.4590
43	1849	1452.2046	70.5932	3529.6600	2823.7280	2117.3300	1764.8300	1411.8640	1058.8650	847.1184	705.9320
44	1936	1520.5344	73.9110	3695.5500	2936.4400	2217.3300	1847.7750	1468.2200	1108.6600	886.9320	734.1100
45	2025	1590.4350	77.312	3865.6300	3092.5040	2319.3780	1932.815	1546.2520	1159.6890	927.7512	773.1260
46	2116	1661.9064	80.7870	4039.3500	3231.4800	2423.6100	2019.6750	1615.7400	1211.805	969.4440	807.8700
47	2209	1734.9486	84.3377	4216.8850	3373.5080	2530.1310	2108.4425	1686.7540	1265.0655	1012.0524	843.3750
48	2304	1809.5616	87.9648	4398.2400	3518.5920	2638.9440	2199.1200	1759.2960	1319.4720	1055.5776	879.6480
49	2401	1885.7545	91.6681	4584.4050	3667.5240	2750.0430	2292.2050	1833.3620	1375.0215	1100.0172	916.6810
50	2500	1963.5000	95.4478	4773.3900	3817.9120	2863.4340	2386.1950	1908.9560	1431.2120	1145.3736	954.4780
51	2601	2042.8254	99.3038	4965.4100	3972.1520	2979.1140	2482.7200	1986.0760	1489.5570	1191.6456	993.0380
52	2704	2123.7216	103.15[illegible]	5159.3850	4127.5080	3095.6310	2579.6925	2063.7540	1547.8150	1238.2520	1031.8770
53	2809	2206.8836	107.2453	5362.2650	4289.8120	3217.3590	2681.1325	2144.9060	1608.6795	1286.9436	1072.4530
54	2916	2290.2264	111.3302	5566.5100	4453.2080	3339.9060	2783.2550	2226.6040	1669.9530	1335.9624	1113.3020
55	3025	2375.835	115.4219	5774.5950	4619.6760	3464.7570	2887.2975	2309.8380	1732.3785	1385.9028	1154.9140
56	3136	2463.014	119.7029	5985.1450	4788.1160	3591.0870	2992.5725	2394.0580	1795.5435	1436.4348	1197.0290
57	3249	2551.7646	124.0436	6202.1950	4961.7560	3721.3170	3101.0975	2480.8780	1860.6585	1488.5268	1240.4390
58	3364	2642.0856	128.4347	6421.7350	5137.3880	3853.0410	3210.8675	2568.6940	1926.5205	1541.2164	1284.3470
59	3481	2733.9774	132.9010	6645.0800	5316.0640	3987.0480	3322.5400	2658.0320	1993.5240	1594.8192	1329.0160
60	3600	2827.4400	137.4450	6872.2500	5497.8000	4123.3500	3436.1250	2748.4000	2061.6750	1649.3400	1374.2000
61	3721	2922.4734	142.0606	7103.2300	5682.5840	4261.9380	3551.6150	2841.2920	2130.9690	1704.7752	1420.6460
62	3844	3019.0776	146.7600	7338.030	5870.4240	4402.8180	3669.0150	2935.2120	2201.4090	1761.1272	1467.6060
63	3969	3117.2530	151.496	7574.8400	6059.8720	4544.9040	3787.4200	3029.9360	2272.4520	1817.9616	1514.9680
64	4096	3216.9984	156.3330	7816.6550	6253.3240	4689.9930	3908.3275	3126.6620	2344.9965	1875.9972	1563.3310
65	4225	3318.3150	162.1664	8108.3200	6486.6560	4864.9920	4054.1600	3243.3280	2432.4960	1945.9968	1621.6640
66	4356	3421.2024	166.3081	8315.4400	6652.3520	4989.2320	4157.7200	3326.1760	2494.6260	1995.7008	1663.0815
67	4489	3525.6600	171.3962	8569.8100	6855.4480	5141.5860	4284.6500	3427.7200	2570.7930	2056.6344	1713.8620
68	4624	3631.6896	176.5403	8827.0150	7061.6120	5296.2090	4413.5075	3530.8060	2648.1045	2118.4836	1765.4030
69	4761	3739.2904	181.7770	9088.8500	7270.8320	5453.1240	4544.2700	3635.4160	2726.5620	2181.2496	1817.7080
70	4900	3848.4600	187.0770	9353.8950	7483.1160	5612.3370	4676.9475	3741.5580	2806.1685	2244.9348	1870.7790
71	5041	3959.2016	192.4611	9623.0550	7698.4440	5773.8330	4811.5275	3849.2220	2886.9165	2309.5332	1924.6110
72	5184	4071.5136	197.9214	9896.0500	7916.8400	5937.6300	4948.0250	3958.4200	2968.8150	2375.0520	1979.2100
73	5329	4185.4960	203.4560	10172.8350	8138.2680	6103.7010	5086.4175	4069.1340	3051.8525	2441.4820	2034.5670
74	5476	4300.9488	209.0670	10453.3500	8362.7000	6272.0250	5226.7250	4181.3800	3136.0350	2508.8280	2090.9400
75	5625	4417.9725	214.7570	10737.8500	8590.3040	6442.7280	5368.9400	4295.1520	3221.3640	2577.0912	2147.5760
76	5776	4536.6176	220.5227	11024.1350	8820.9080	6615.6810	5513.6750	4410.4540	3307.8405	2646.7724	2205.6270
77	5929	4656.8836	226.3700	11315.7400	9052.6240	6789.4680	5657.8900	4526.3120	3394.7340	2715.7872	2263.1600
78	6084	4778.7744	232.2950	11614.1000	9291.2800	6968.4600	5807.0500	4645.6400	3484.2300	2787.3840	2322.8200
79	6241	4901.9904	238.3990	11915.4650	9532.3720	7149.2790	5957.7325	4766.1860	3574.6395	2859.7116	2383.0930
80	6400	5026.5600	244.3840	12217.8250	9774.2600	7330.3950	6108.6625	4886.9300	3665.1975	2933.1580	2443.4650
81	6561	5152.5840	250.4530	12524.6650	10019.7320	7514.7990	6262.3250	5009.8600	3757.3950	3005.9160	2504.3300
82	6724	5280.0624	256.7100	12837.5500	10268.0400	7701.0300	6417.5150	5134.3320	3850.7490	3080.5992	2567.1660
83	6889	5408.9952	263.0570	13155.2900	10524.6480	7890.4860	6575.4050	5260.3240	3945.2430	3156.1944	2630.1620
84	7056	5541.4824	269.4970	13477.9250	10782.3400	8082.7550	6735.6250	5388.5000	4041.3750	3233.1000	2694.2500
85	7225	5675.5225	276.0440	13806.2200	11044.9760	8277.7320	6898.1100	5518.4880	4138.6660	3310.9328	2759.4440
86	7396	5811.1144	282.7000	14140.0000	11312.0000	8475.0000	7062.5000	5650.0000	4235.5000	3388.4000	2823.7000
87	7569	5948.2584	289.4670	14479.1750	11583.3400	8675.0050	7229.4475	5783.5580	4337.6685	3470.1348	2891.2790
88	7744	6086.9536	296.3470	14823.6150	11858.9320	8876.7990	7397.3325	5917.8660	4438.3995	3550.7196	2958.9330
89	7921	6227.1984	303.3440	15173.6000	12138.8800	9080.2640	7566.8800	6053.5040	4540.1280	3632.1024	3026.7520
90	8100	6368.9920	310.4600	15528.9950	12423.1960	9285.5880	7737.9900	6190.3920	4642.7940	3714.2352	3095.1960
91	8281	6512.3344	317.6970	15889.8500	12711.8800	9492.7500	7910.6250	6328.5000	4746.3750	3797.1000	3164.2500
92	8464	6657.2256	324.1483	16157.4150	12925.9320	9694.4490	8078.7075	6462.9660	4847.2245	3877.7796	3231.4830
93	8649	6803.6656	331.6240	16510.5[illegible]	13208.4560	9906.3180	8255.2650	6604.2120	4953.1590	3962.5272	3302.1060
94	8836	6951.6544	338.7510	16867.6[illegible]	13494.4[illegible]	10120.3[illegible]	8433.7[illegible]	6746.9[illegible]	5060.2[illegible]	4048.1[illegible]	3373.4[illegible]
95	9025	7100.2350	344.9[illegible]	17228.0[illegible]	13782.6760	10337.0[illegible]	8614.1750	6891.3[illegible]	5168.5[illegible]	4135.4[illegible]	3446.1[illegible]
96	9216	7250.4864	352.4[illegible]	17592.9750	14074.3[illegible]	10555.7[illegible]	8796.4[illegible]	7037.[illegible]	5277.8925	4222.3140	3518.7[illegible]
97	9409	7402.3[illegible]	359.[illegible]	17959.7400	14367.7[illegible]	10775.8[illegible]	8979.8[illegible]	7183.8[illegible]	5387.9[illegible]	4312.7[illegible]	3593.9[illegible]
98	9604	7555.6016	366.6542	18334.2100	14667.3[illegible]	11000.5260	9167.1[illegible]	7333.6[illegible]	5500.2[illegible]	4400.2[illegible]	3667.6812
99	9801	7709.7034	374.1930	18709.6900	14967.7520	11225.8140	9354.3450	7483.7[illegible]	5612.9[illegible]	4490.3[illegible]	3741.9[illegible]
100	10000	7854.0000	381.7917	19089.5750	15271.6[illegible]	11453.7420	9544.7[illegible]	7635.8[illegible]	5726.8[illegible]	4581.4[illegible]	3817.9150

TABLE V. of Blowing Cylinders, their Area, Capacity, and Quantity of Air, discharged by an Eight-Feet Stroke.

Diameters of Cylinders	Area in Circular Inches.	Area in Square Inches.	Capacity of the Stroke in Cubical Feet.	Air discharged at the Rate of 50 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 40 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 30 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 25 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 20 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 15 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 12 Cylinders per Minute in Cubical Feet.	Air discharged at the Rate of 10 Cylinders per Minute in Cubical Feet.
36	1296	1017.8784	56.5488	2827.4400	2261.9520	1696.4640	1413.7200	1130.9760	848.2320	678.5856	565.4880
37	1369	1075.8670	59.7340	2986.7000	2389.3600	1792.0200	1493.3500	1194.6800	896.0100	680.8080	597.3400
38	1444	1134.1176	63.0064	3150.3200	2520.2560	1890.1920	1575.1600	1260.1280	945.0960	756.0768	630.0640
39	1521	1194.5934	66.3662	3318.3100	2654.6480	1990.9860	1659.1550	1327.3240	995.4930	796.3944	663.6620
40	1600	1256.6400	69.8110	3490.5500	2792.4400	2094.3300	1745.2750	1396.2200	1047.1650	837.7320	698.1100
41	1681	1320.2574	73.3476	3667.3800	2933.9040	2200.4280	1833.6900	1466.9520	1100.2140	880.1712	733.4760
42	1764	1385.4456	76.9568	3848.3400	3078.6720	2309.0040	1924.1700	1539.3360	1154.5020	923.6016	769.0680
43	1849	1452.2046	80.6780	4033.9000	3227.1200	2420.3400	2016.9500	1613.5600	1210.1700	968.1360	806.7800
44	1936	1520.5344	84.4740	4233.7000	3378.9600	2534.2200	2116.8500	1689.4800	1267.1100	1013.6880	844.7400
45	2025	1590.4350	88.3574	4417.8700	3534.2960	2650.7220	2208.9350	1767.1480	1325.3610	1062.4488	883.5740
46	2116	1661.9064	92.3280	4616.4000	3693.1200	2769.8400	2308.2000	1846.5600	1384.9200	1107.9360	923.2800
47	2209	1734.9486	96.3860	4819.3000	3855.4400	2891.5800	2409.6500	1927.7200	1445.7900	1156.6320	963.8600
48	2304	1809.5616	100.5312	5026.5600	4021.2480	3015.9360	2513.2800	2010.6240	1507.9680	1206.3744	1005.3120
49	2401	1885.7545	104.7636	5238.1800	4190.5440	3142.9080	2619.0900	2095.2720	1571.4540	1255.1632	1047.6360
50	2500	1963.5000	109.0832	5454.1600	4363.3280	3272.4960	2727.0800	2181.6940	1636.2480	1308.9984	1090.8470
51	2601	2042.8254	113.4900	5674.5100	4539.6080	3404.7060	2837.2550	2269.8040	1702.3530	1361.8824	1134.9020
52	2704	2123.7216	117.9288	5896.4400	4717.1520	3537.8640	2948.2200	2358.5760	1768.9320	1415.1456	1179.2880
53	2809	2206.2886	122.5660	6128.3000	4902.6400	3676.9800	3064.1500	2451.3200	1838.4900	1470.7920	1225.6600
54	2916	2290.2264	127.2346	6361.7300	5089.3840	3817.0380	3180.8650	2544.6920	1908.5190	1526.8152	1272.3460
55	3025	2375.3350	131.9300	6599.5400	5279.6320	3959.7240	3299.7700	2639.8160	1979.8620	1583.8896	1319.9080
56	3136	2463.0144	136.8034	6840.1700	5472.1360	4104.1020	3420.0850	2736.0680	2052.0510	1641.6438	1368.0340
57	3249	2551.7646	141.7646	7088.2300	5670.5840	4252.9380	3544.1150	2835.2920	2126.9690	1701.1752	1417.6460
58	3364	2642.0856	146.7826	7339.1300	5871.3040	4403.4780	3669.5650	2935.6520	2201.7390	1751.3912	1467.8260
59	3481	2733.9774	151.8876	7594.3800	6075.5040	4556.6280	3797.1900	3037.7520	2278.3140	1812.6312	1518.8760
60	3600	2827.4400	157.0800	7854.0000	6283.2000	4712.4000	3927.0000	3141.6000	2356.2000	1884.9600	1570.8000
61	3721	2922.4734	162.3596	8117.9800	6494.3840	4870.7880	4058.9900	3247.1920	2435.3940	1948.3152	1623.5960
62	3844	3019.0776	167.7264	8386.3200	6709.0560	5031.7920	4193.1600	3354.5280	2515.8960	2012.7168	1677.2640
63	3969	3117.2526	173.1406	8657.0300	6925.6240	5194.2180	4328.5150	3462.8120	2597.1040	2077.6872	1731.4010
64	4096	3216.9984	178.6664	8933.3200	7146.6560	5359.9920	4466.6600	3573.3280	2679.9960	2144.1968	1786.6640
65	4225	3318.3150	184.3508	9217.5400	7374.0320	5530.5240	4608.7700	3687.0160	2765.2620	2212.2096	1843.5080
66	4356	3421.2024	190.0668	9503.3400	7602.6720	5702.0040	4751.6700	3801.3360	2851.0020	2280.8016	1900.1680
67	4489	3525.6606	195.8700	9793.5000	7834.8000	5876.1000	4896.7500	3917.4000	2938.0500	2350.4400	1958.7000
68	4624	3631.6896	201.7604	10088.0200	8070.4160	6052.8120	5044.0100	4035.2080	3026.4060	2421.1248	2017.6040
69	4761	3739.2894	207.7382	10386.9100	8309.5280	6232.1460	5193.4550	4154.7640	3116.0730	2492.8584	2077.3820
70	4900	3848.4600	213.8034	10690.1700	8552.1360	6414.1020	5345.0850	4276.0680	3207.0510	2565.6408	2138.0340
71	5041	3959.2014	219.9556	10997.7800	8798.2240	6598.6680	5498.8900	4399.1120	3299.3340	2639.4672	2199.5560
72	5184	4071.5136	226.1952	11309.7600	9047.8080	6785.8560	5654.8800	4523.9040	3392.9280	2714.3424	2261.9520
73	5329	4185.3966	232.5220	11626.1000	9300.8800	6975.6600	5813.0500	4650.4400	3487.8300	2790.2640	2325.2200
74	5476	4300.8504	238.9360	11946.8000	9557.4400	7168.0800	5973.4000	4778.7200	3584.0400	2867.2320	2389.3600
75	5625	4417.8750	245.4374	12271.8700	9817.4960	7363.1220	6135.9350	4908.7480	3681.0610	2945.2488	2454.3740
76	5776	4536.4704	252.0260	12601.3000	10081.0400	7560.7800	6300.6500	5040.5200	3780.3900	3024.3126	2520.2600
77	5929	4656.6366	258.6464	12932.3200	10345.8560	7759.3920	6466.1600	5172.9280	3879.6960	3103.7568	2586.4640
78	6084	4778.3736	265.4652	13273.2600	10618.6080	7963.9560	6636.6300	5309.3040	3981.9780	3185.5824	2654.6520
79	6241	4901.6814	272.3156	13615.7800	10892.6240	8169.4680	6807.8900	5446.3120	4084.7340	3267.7872	2723.1560
80	6400	5026.5600	279.2530	13962.6500	11170.1200	8377.5900	6981.3250	5585.0600	4188.7950	3351.0360	2792.5300
81	6561	5153.0094	286.2782	14313.9100	11451.1280	8588.3460	7156.9550	5725.5640	4294.1730	3435.3834	2862.7820
82	6724	5281.0296	293.3904	14669.5200	11735.6160	8801.7120	7334.7600	5867.8080	4400.8560	3520.6848	2933.9040
83	6889	5410.6206	300.5900	15029.5000	12023.6000	9017.7000	7514.7500	6011.8000	4508.8500	3607.0800	3005.9000
84	7056	5541.7824	307.8772	15393.8600	12315.0880	9236.3160	7696.9300	6157.5440	4618.1580	3694.5264	3078.2720
85	7225	5674.5150	315.2508	15762.5400	12610.0320	9457.5240	7881.2700	6305.0160	4728.2620	3783.0096	3152.5080
86	7396	5808.8184	322.7120	16135.6000	12908.4800	9681.3600	8067.8000	6454.2400	4840.6800	3872.5440	3227.1200
87	7569	5944.6926	330.2606	16513.0300	13210.4240	9907.8180	8256.0150	6655.2120	4953.9090	3963.1272	3327.6060
88	7744	6082.1376	337.8964	16894.8200	13515.8560	10136.8920	8447.4120	6757.4280	5068.4460	3054.7568	3378.7140
89	7921	6221.1534	345.6196	17280.9800	13824.7840	10368.5880	8640.4900	6912.3920	5184.2940	4147.4352	3456.1960
90	8100	6361.7400	353.4300	17671.5000	14137.2000	10602.9000	8835.7500	7068.6000	5301.4500	4241.1600	3534.3000
91	8281	6503.8974	361.3276	18066.3800	14453.1040	10839.8280	9033.1900	7226.5520	5419.9140	4335.9312	3613.2760
92	8464	6647.6256	369.3124	18465.6200	14772.4960	11079.3720	9232.8100	7386.2480	5539.6860	4431.7488	3693.1240
93	8649	6792.9246	377.3846	18869.2300	15095.3840	11321.5380	9434.6150	7547.6920	5660.7690	4528.6152	3773.8460
94	8836	6939.7944	385.5440	19277.200	15421.7600	11566.3200	9638.2000	7710.8800	5783.1600	4626.5280	3855.4400
95	9025	7088.2350	393.790	19689.5400	15751.6320	11813.7240	9844.7700	7875.8160	5906.8620	4725.4896	3937.9080
96	9216	7238.2464	402.1252	20106.2600	16085.0080	12063.7560	10053.1300	8042.5040	6031.8780	4825.5024	4021.2520
97	9409	7389.8286	410.5460	20527.3000	16421.8400	12316.3800	10263.1500	8210.9200	6158.1900	4926.5520	4105.4600
98	9604	7542.9816	419.0544	20952.7200	16762.1760	12571.6320	10476.3600	8381.8800	6285.8160	5028.6528	4190.5440
99	9801	7697.7054	427.6502	21382.5100	17106.0080	12829.5060	10691.2550	8553.0040	6414.7530	5131.8024	4276.5020
100	10000	7854.0000	436.3332	21816.6600	17453.3280	13089.9960	10908.3300	8726.6640	6544.9980	5235.9984	4363.3320

TABLE I. of the Powers of Steam Engines working at the Rate of 5 lbs. Avoirdupoise upon every Circular Inch, or 6.3[illegible]6 lb. upon every Square Inch of the Steam Piston applicable to Blowing Machinery; and the Areas and Diameters of Blowing Cylinders requisite to raise Air of various Densities from 1½ lb. to 4 lbs. upon each Circular Inch, or from 1.90 lb. to 5.092 lbs. Avoirdupoise upon each Square Inch of the Air Receiver.

Diameter of Steam Cylind.	Area of Ditto	Power of the Engine in Pounds	Blast 1½ lb. per Circular Inch, or 1.90 lb. per Square Inch.		Blast 1¾ lb. per Circular Inch, or 2.22 lb. per Square Inch.		Blast 2 lb. per Circular Inch, or 2.54 lb. per Square Inch.		Blast 2¼ lb. per Circular Inch, or 2.86 lb. per Square Inch.		Blast 2½ lb. per Circular Inch, or 3.18 lb. per Square Inch.		Blast 2¾ lb. per Circular Inch, or 3.49 lb. per Square Inch.		Blast 3 lb. per Circular Inch, or 3.81 lb. per Square Inch.		Blast 3¼ lb. per Circular Inch, or 4.13 lb. per Square Inch.		Blast 3½ lb. per Circular Inch, or 4.45 lb. per Square Inch.		Blast 3¾ lb. per Circular Inch, or 4.77 lb. per Square Inch.		Blast 4 lb. per Circular Inch, or 5.09 lb. per Square Inch.	
			Area of Cylinder.	Diam. of Ditto	Area of blowing Cylinder.	Diameter of Ditto	Area of blowing Cylinder.	Diameter of Ditto.	Area of blowing Cylinder.	Diameter of Ditto.	Area of blowing Cylind.	Diam. of Ditto	Area of blowing Cylind	Diam. of Ditto	Area of blowing Cylind.	Diam. of Ditto.	Area of blowing Cylind	Diam. of Ditto	Area of blowing Cylind	Diam. of Ditto	Area of blowing Cylind.	Diam. of Ditto.	Area of blowing Cylind	Diam. of Ditto
20	4[illegible]	2000	1[illegible]	[illegible]	1142	34	1000	32	88[illegible]	[illegible]	800	28¼	727	27	666	26	615	24	571	24	533	23	[illegible]	2[illegible]
21	44[illegible]	2205	1470	38¾	1260	35½	1102	33½	980	31¼	882	29½	801	28¼	735	27¼	678	26	630	25	588	24	551	23½
22	4[illegible]	2420	1613	40	1383	37¼	1210	35	1075	33	962	31	880	29½	806	28½	744	27¼	691	26¼	645	25¼	60[illegible]	4½
23	52[illegible]	[illegible]	[illegible]	[illegible]	1511	[illegible]	1322	[illegible]	1175	34¼	1058	32½	961	31	881	29¾	813	28½	755	27½	70[illegible]	26½	66[illegible]	[illegible]
24	77[illegible]	2880	1920	44	1645	40½	1440	38	1280	35¾	1152	34	1047	32¼	960	31	886	29¾	822	28½	768	27¼	720	27
25	6[illegible]	[illegible]	[illegible]	[illegible]	1785	42¼	1562	39½	1388	37¼	1250	35½	1136	33¾	1041	32¼	961	31	892	29¾	833	29	7[illegible]	[illegible]
26	67[illegible]	[illegible]	2[illegible]	47½	1931	44	1690	41	1502	38¾	1352	36¾	1229	35	1126	33½	1040	32¼	965	31	901	30	[illegible]	29
27	72[illegible]	3[illegible]	[illegible]	49½	[illegible]	[illegible]	[illegible]	42½	1620	40¼	1458	[illegible]	[illegible]	36½	1215	33¾	1121	32½	1041	32½	97[illegible]	31	911	30½
28	784	3920	[illegible]	[illegible]	2140	47¾	1900	44	1742	41¾	1500	39½	1425	37¾	1306	36	1206	34¾	1120	33½	1045	32½	[illegible]	31
29	841	4205	28[illegible]	[illegible]	2440	49	[illegible]	45½	1765	43½	1682	41	1529	39	1401	37¼	29[illegible]	36	1201	34¾	112[illegible]	[illegible]	1051	32½
30	900	4500	[illegible]	[illegible]	[illegible]	[illegible]	2277	47¼	2000	44½	1800	42½	1636	40½	1500	38¾	1384	37¼	1285	36	1200	34[illegible]	112	33½
31	961	4805	[illegible]	[illegible]	[illegible]	[illegible]	2400	49	2135	46¼	1922	44	1747	41½	1601	40	[illegible]	[illegible]	1478	38½	1371	37¼	1281	36
32	1024	5120	341[illegible]	5[illegible]	29[illegible]	[illegible]	25[illegible]	50½	2275	47¾	2048	45¼	1861	43	1706	41¼	1575	39¾	1462	38¼	136[illegible]	37	1280	35¾
33	108[illegible]	5445	36[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	52	[illegible]	48½	2178	46½	1980	44½	1815	42½	167[illegible]	41	1554	39½	1442	38	1361	37
34	1156	5780	[illegible]	62	[illegible]	[illegible]	[illegible]	53¾	[illegible]	[illegible]	2312	48½	2101	46	1926	43¾	1778	42	1651	40¼	1541	39¼	144[illegible]	[illegible]
35	1225	6125	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	55½	[illegible]	[illegible]	2450	[illegible]	2227	47½	2041	45	1884	43½	1748	41½	163[illegible]	40	1531	39½
36	1296	6480	4320	66	3702	61	3240	57	2880	53¾	2592	50½	2356	48½	2160	46½	1993	44¾	1851	43	1728	41¾	1620	40½
37	1369	6845	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	58½	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2281	47¾	2106	46	1954	44½	182[illegible]	[illegible]	1711	41½
38	1444	7220	4800	[illegible]	[illegible]	[illegible]	[illegible]	60	[illegible]	[illegible]	2888	[illegible]	2627	[illegible]	2406	49	2222	47½	2062	[illegible]	192[illegible]	44	1805	42½
39	1521	7605	5070	71	4345	[illegible]	[illegible]	61	[illegible]	[illegible]	[illegible]	[illegible]	2765	[illegible]	[illegible]	[illegible]	[illegible]	48	2172	46	2028	45	1901	43
40	1600	8000	5333	73	4571	67¾	4000	63½	3555	59½	3200	56½	2909	54	2666	51½	2461	49¾	2285	47¾	2033	[illegible]	2000	44
41	1681	8405	5601	75	4802	69½	4200	[illegible]	[illegible]	[illegible]	3362	[illegible]	3056	[illegible]	2801	[illegible]	2586	51	2400	49	[illegible]	47	2101	[illegible]
42	1764	8820	5880	77¾	5040	71	4410	66½	[illegible]	62½	3528	59½	3207	[illegible]	2940	54½	2715	52½	[illegible]	50½	2352	[illegible]	[illegible]	47
43	1849	9245	6230	79	5340	72¾	4620	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3361	[illegible]	3081	55½	2847	53½	2656	51½	2465	[illegible]	2311	[illegible]
44	1936	[illegible]	6453	82½	5531	74½	4840	[illegible]	4400	65½	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	52½	[illegible]	[illegible]	[illegible]	[illegible]
45	2025	10125	6750	82	5784	77	5060	71	4500	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3375	[illegible]	[illegible]	56	[illegible]	53½	[illegible]	[illegible]	[illegible]	50
46	2116	10580	7053	84	6004	77¾	5290	72¾	4704	68½	4232	65	3847	62	3526	59¼	3255	57	3022	55	[illegible]	[illegible]	2645	[illegible]
47	2209	11045	7363	85¾	6311	79½	5522	74½	4891	70	4418	66½	4016	63½	3681	60½	3398	58½	3155	56¼	[illegible]	54	2701	52½
48	2304	11520	768[illegible]	87½	6582	81	5760	75¾	5120	71¼	4608	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
49	2401	12005	[illegible]	[illegible]	6857	82½	[illegible]	77½	5335	73	4802	69½	4365	66	4001	63½	3693	60¾	3428	58½	[illegible]	[illegible]	[illegible]	[illegible]
50	2500	12500	[illegible]	91½	7142	84½	6250	75	[illegible]	74½	[illegible]	71½	4545	67½	4166	[illegible]	[illegible]	[illegible]	3571	[illegible]	[illegible]	[illegible]	3125	[illegible]
51	[illegible]	13005	8666	93	7431	86¼	6502	80½	5780	76	5202	72¼	4729	68¾	4335	66	4001	63¼	3714	[illegible]	[illegible]	[illegible]	2951	[illegible]
52	2704	[illegible]	9013	95	7727	88	6760	82½	[illegible]	[illegible]	5408	[illegible]	4910	[illegible]	4504	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	58
53	2809	14045	9363	97½	8023	[illegible]	7022	[illegible]	6242	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3511	9[illegible]
54	2916	14580	9720	99½	8331	91½	7290	85½	6480	[illegible]	5832	79½	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3645	60[illegible]
55	3025	15125	10083	102½	8642	93	7562	87	6722	82	6050	76½	5500	74½	5041	71	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3781	[illegible]
56	3136	17680	[illegible]	104½	[illegible]	94½	7840	[illegible]	[illegible]	83	6272	79½	5701	75½	5225	72½	[illegible]	[illegible]	4480	[illegible]	4101	[illegible]	3920	62½
57	3249	16245	10832	104	9284	96½	8122	90	7220	85	6498	[illegible]	5907	76½	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	63½
58	3364	16820	11213	106	9611	98	8410	91½	7475	87½	6728	82	[illegible]	78½	[illegible]	75	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4205	64¾
59	3481	17405	[illegible]	[illegible]	9947	99½	8701	93½	7734	[illegible]	[illegible]	[illegible]	6320	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7174	[illegible]	[illegible]	[illegible]	[illegible]	66
60	3600	[illegible]	[illegible]	[illegible]	[illegible]	101½	[illegible]	96	[illegible]	89½	[illegible]	82½	5545	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4427	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
61	3721	[illegible]	12405	111½	10262	103½	[illegible]	[illegible]	8860	91	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5724	[illegible]	5115	[illegible]	[illegible]	[illegible]	[illegible]	68½
62	3844	19220	12813	112½	[illegible]	104½	[illegible]	[illegible]	9544	94½	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	77	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
63	[illegible]	[illegible]	[illegible]	115	[illegible]	105	[illegible]	[illegible]	[illegible]	94	[illegible]	[illegible]	[illegible]	5	[illegible]	[illegible]	[illegible]	78¾	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	70½
64	4096	[illegible]	[illegible]	117	[illegible]	106½	[illegible]	[illegible]	9102	95½	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	79½	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	71
65	4225	21125	14083	118¾	12071	110	10502	102¾	9388	97	8482	91¾	7681	87¾	7041	84	6500	80¾	6035	[illegible]	[illegible]	[illegible]	[illegible]	72
66	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	111	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	81¾	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
67	[illegible]	[illegible]	14445	[illegible]	[illegible]	112½	[illegible]	106	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
68	[illegible]	23120	[illegible]	[illegible]	[illegible]	113	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
69	4761	23805	[illegible]	126	[illegible]	114	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5951	77
70	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	115	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6125	78¾

TABLE II. of the Powers of Steam Engines working at the Rate of 6 lbs. Avoirdupoise upon every Circular Inch, or 7.639 lb. upon every Square Inch of the Steam Piston applicable to Blowing Machinery; and the Areas and Diameters of Blowing Cylinders requisite to raise Air of various Densities from 1½ lb. to 4 lbs. upon each Circular Inch, or from 1.90 lb. to 5.092 lbs. Avoirdupoise upon each Square Inch of the Air Receiver.

Diameter of Steam Cylinder.	Areas of Ditto.	Power of the Engine in Pounds.	Blast 1½ lb. per Circular Inch, or 1.90 lb per Square Inch.		Blast 1¾ lb. per Circular Inch, or 2.22 lb. per Square Inch		Blast 2 lb. per Circular Inch, or 2.54 lb per Square Inch.		Blast 2½ lb. per Circular Inch, or 2.80 lb per Square Inch.		Blast 2¾ lb. per Circular Inch, or 3.19 lb. per Square Inch.		Blast 3 lb. per Circ. Inch, or 3.41 lb. per Square Inch		Blast 3½ lb. per Circ. Inch, or 3.81 lb per Square Inch.		Blast 3¾ lb. per Circ. Inch, or 4.13 lb. per Square Inch		Blast 4 lb per Circ. Inch, or 4.45 lb. per Square Inch.		Blast 4¼ lb per Circ. Inch, or 4.77 lb. per Square Inch		Blast 4½ lb per Circular Inch, or 5.09 lb per Square Inch.	
			Area of Blowing Cylinder.	Diameter of Ditto.	Area of Blowing Cylinder.	Diameter of Ditto	Area of Blowing Cylinder.	Diameter of Ditto	Area of Blowing Cylinder.	Diameter of Ditto	Area of Blowing Cylinder.	Diameter of Ditto	Area of Blowing Cylinder.	Diameter of Ditto	Area of Blowing Cylinder.	Diam. of Ditto	Area of Blowing Cylinder.	Diam. of Ditto	Area of Blowing Cylinder.	Diam. of Ditto	Area of Blowing Cylinder.	Diam. of Ditto	Area of Blowing Cylinder.	Diam. of Ditto
20	400	2400	1600	40	1371	37	1200	34½	1066	32¾	960	31	872	29½	800	28¼	788	27¼	685	26¼	640	25½	600	24¾
21	441	2646	176	42	1512	38¾	1323	36½	1176	34¼	1058	32½	962	31	882	29½	814	28½	756	27½	705	26½	661	25¾
22	484	2904	1936	44	1659	40½	1452	38	1290	36	1161	34	1056	32½	968	31	893	30	829	28¾	774	27¾	726	27
23	529	3174	2116	46	1813	42¼	1587	39¾	1410	37½	1269	35½	1154	34	1058	32½	976	31¼	909	30	846	29	793	28
24	576	3456	2304	48	1974	44½	1728	41½	1536	39	1382	37	1256	35½	1152	34	1063	32¾	987	31¼	921	30¼	864	29¼
25	625	3750	2500	50	2142	46¼	1875	43¼	1666	40¾	1500	38½	1363	37	1250	35½	1153	34	1071	32½	1000	31½	937	30½
26	676	4056	2704	52	2317	48	2028	45	1802	42½	1622	40	1475	38½	1352	37	1248	35¼	1159	34	1081	32¾	1014	31¾
27	729	4374	2916	54	2499	50	2187	46¾	1944	44	1749	41¾	1590	40	1458	38¼	1345	36¾	1249	35¼	1166	34	1093	33
28	784	4704	3136	56	2688	51¾	2352	48½	2092	45½	1880	43¼	1710	41½	1568	39½	1447	38	1344	36½	1254	35¼	1176	34
29	841	5046	3364	58	2883	53½	2523	50¼	2242	47¾	2018	45	1834	43	1682	41	1552	39¼	1441	38	1345	36½	1261	35½
30	900	5400	3600	60	3085	55½	2700	52	2400	49	2160	46½	1963	44½	1800	42½	1661	40¾	1542	39¼	1440	37¾	1350	36¾
31	961	5766	3844	62	3289	57¼	2883	53¾	2562	50½	2306	48	2096	46	1922	44	1774	42	1645	40½	1537	39	1441	38
32	1024	6144	4096	64	3510	59	3072	55½	2730	52¼	2457	49½	2234	47½	2048	45¼	1819	43½	1755	41¾	1638	40¼	1536	39¼
33	1089	6534	4356	66	3733	61	3267	57¼	2904	54	2613	51	2376	49	2178	46½	2010	45	1866	43¼	1742	41½	1633	40½
34	1156	6936	4624	68	3963	63	3468	58¾	3082	55½	2774	52½	2522	50½	2312	48	2134	46¼	1981	44½	1849	43	1734	41¾
35	1225	7350	4900	70	4200	65	3675	60½	3266	57¼	2940	54	2672	51¾	2450	49½	2261	47½	2100	45¾	1960	44¼	1837	43
36	1296	7776	5184	72	4443	66¾	3888	62¼	3456	59	3110	55½	2827	53¼	2592	51	2392	49	2221	47	2073	45½	1944	44¼
37	1369	8214	5476	74	4693	68½	4107	64	3650	60½	3285	57	2986	54¾	2738	52½	2527	50¼	2346	48¼	2190	46¾	2053	45½
38	1444	8664	5776	76	4950	70¾	4332	65¾	3850	62	3465	58½	3150	56	2888	53¾	2662	51½	2475	49½	2310	48	2166	46¾
39	1521	9126	6084	78	5214	72¼	4563	67½	4056	63¾	3650	60¼	3314	57½	3042	55	2808	53	2607	51¼	2433	49½	2281	48
40	1600	9600	6400	80	5485	74	4800	69¼	4266	65½	3840	62	3490	59	3200	56½	2953	54½	2742	52¼	2560	50½	2400	49
41	168	10086	6724	82	5763	76	5043	71	4482	67	4034	63½	3667	60½	3362	58	3103	55¼	2881	53¾	2689	51¾	2521	50¼
42	1764	10584	7056	84	6048	77¾	5292	72¾	4704	68½	4233	65	3848	62	3528	59½	3256	57	3024	55	2822	53	2646	51½
43	1849	11094	7396	86	6339	79½	5547	74½	4961	70¼	4485	66½	4034	62½	3698	60¾	3413	58½	3169	56¼	2958	54¼	2773	52½
44	1936	11616	7744	88	6637	81¼	5808	76¼	5162	72	4646	68	4224	64	3872	62	3574	60	3318	57½	3097	55½	2904	53¾
45	2025	12150	8100	90	6942	83¼	6075	78	5400	73½	4860	69½	4418	66½	4050	63½	3738	61¼	3471	59	3240	56¾	3037	55
46	2116	12696	8464	92	7254	85	6348	79¾	5642	75	5078	71¼	4616	68	4232	65	3906	62½	3627	60¼	3385	58	3176	56¼
47	2209	13254	8836	94	7573	87	6627	81¾	5890	76¾	5301	73	4819	69½	4418	66½	4078	64	3786	61½	3534	59¼	3313	57½
48	2304	13824	9216	96	7899	88½	6912	83¼	6144	78½	5529	74½	5026	71	4608	68	4253	65¼	3949	62¾	3686	60½	3456	58¾
49	2401	14406	9364	98	8232	90¾	7203	84¾	6002	80	5762	76	5238	72½	4802	69½	4432	66½	4116	64	3843	61¾	3600	59¾
50	2500	15000	10000	100	8571	92½	7500	86½	6666	81½	6000	77½	5454	74	5000	70¾	4613	68	4285	65¼	4000	63	3750	61
51	2601	15606	10404	102	8917	94½	7803	88½	6936	83¼	6242	79	5675	75½	5202	72	4801	69¼	4458	66½	4161	64½	3901	62¼
52	2704	16224	10816	104	9270	96¾	8112	90	7210	85	6489	80½	5899	77	5408	73½	4992	70¾	4635	67¾	4326	65¾	4056	63½
53	2809	16854	11236	106	9630	98¾	8427	91¾	7490	86¼	6741	82	6128	78½	5618	75	5185	72	4815	69¼	4493	67	4213	64¾
54	2916	17496	11664	108	9997	100	8748	93¾	7776	88	6996	83¾	6362	79¾	5832	76½	5383	73½	4998	70½	4666	68¼	4374	66
55	3025	18150	12100	110	10370	101¾	9075	95½	8066	89¾	7260	85¼	6600	81¼	6050	77¾	5584	74¾	5185	72	4840	69½	4537	67¼
56	3136	18816	12544	112	10752	103¾	9408	97	8362	91½	7526	86¾	6842	82¾	6272	79¼	5789	76	5378	73½	5017	70¾	4704	68¼
57	3249	19494	12996	114	11139	105½	9747	98¾	8664	93	7797	88¼	7088	84	6428	80½	5998	77½	5569	74½	5198	72	4873	69¾
58	3364	20184	13456	116	11533	107½	10092	100½	8970	94½	8073	89¾	7339	85½	6728	82	6212	78¾	5765	75¾	5382	73¼	5046	71
59	3481	20886	13924	118	11935	109¼	10443	102¾	9280	96¾	8354	91½	7594	87	6962	83½	6426	80	5967	77¼	5569	74½	5221	72¼
60	3600	21600	14400	120	12342	111	10800	104	9600	98	8640	93	7854	88½	7200	85	6646	81½	6171	78½	5760	75¾	5400	73½
61	3721	22326	14884	122	12754	113	11163	105¾	9922	99½	8930	94½	8118	90	7442	86½	6860	83	6378	79¾	5953	77	5581	74¾
62	3844	23064	15376	124	13170	114¾	11532	107½	10250	101½	9225	96	8386	91½	7688	87¾	7096	84¼	6589	81	6150	78½	5766	76
63	3969	23814	15875	126	13608	116½	11907	109¼	10584	103	9525	97¼	8659	93	7938	89	7327	85½	6804	82¼	6350	79½	5953	77¼
64	4096	24576	16384	128	14043	118½	12288	110¾	10922	104½	9830	99	8936	94½	8192	90	7561	87	7021	83½	6553	80¾	6144	78½
65	4225	25350	16900	130	14485	120½	12675	112½	11266	106	10140	100¾	9218	96	8450	92	7800	88	7242	85	6760	82	6337	79¾
66	4356	26136	17424	132	14934	122¼	13068	114½	11616	107	10454	102¼	9504	97½	8712	93½	8041	90	7467	86¼	6969	83¾	6534	81
67	4489	26934	17956	134	15390	124	13467	116	11970	109½	10773	103¾	9794	99	8978	94¾	8287	91	7695	87¾	7182	84½	6733	82¼
68	4624	27744	18496	136	15853	126	13872	117¾	12230	111	11097	105¼	10088	100½	9248	96¼	8536	92	7925	89	7398	85¾	6936	83¼
69	4761	28560	19044	138	16323	127¾	14285	119½	12693	112½	11426	107	10387	102	9522	97¾	8789	93¾	8161	90	7617	87¼	7141	84½
70	4900	29400	19600	140	16800	129½	14700	121¼	13066	114¼	11760	108½	10690	103½	9800	99¼	9046	95	8400	91½	7840	88½	7350	85¾

TABLE III. of the Powers of Steam Engines working at the Rate of 7lbs. Avoirdupoise upon every Circular Inch, or 8.91 lbs. upon every Square Inch of the Steam Piston, applicable to Blowing Machinery; and the Areas and Diameters of Blowing Cylinders requisite to raise Air of various Densities from 1½ lb. to 4 lbs. upon each Circular Inch, or from 1.90 lb. to 5.092 lbs. Avoirdupoise upon each Square Inch of the Air Receiver.

Diam. of Piston in Inches	Area of Do.	Power of the Piston in Pounds	Blast 1½lb. per Cir. Inch, or 1.90 lb. per Square Inch.		Blast 1¾lb. per Cir. Inch, or 2.22lb. per Square Inch.		Blast 2lb. per Cir. Inch, or 2.54 lb. per Square Inch		Blast 2¼lb. per Cir. Inch, or 2.86lb per Square Inch.		Blast 2½lb. per Cir. Inch, or 3.18lb. per Square Inch.		Blast 2¾ lb. per Cir. Inch, or 3.48lb. per Square Inch.		Blast 3lb per Cir. Inch, or 3.8 lb. per Square Inch.		Blast 3¼lb per Cir. Inch, or 4.13 lb. per Square Inch		Blast 3½lb. per Cir. Inch, or 4.45lb. per Square Inch.		Blast 3¾ lb per Cir. Inch, or 4.77lb. per Square Inch		Blast 4lb. per Cir. Inch, or 5.0 lb. per Square Inch	
			Area of Blowing Cylinder	Diameter of Ditto.	Area of Blowing Cylinder.	Diameter of Ditto.	Area of Blowing Cylinder.	Diameter of Ditto	Area of Blowing Cylinder.	Diameter of Ditto	Area of Blowing Cylinder.	Diameter of Ditto.	Area of Blowing Cylinder.	Diameter of Ditto.	Area of Blowing Cylinder	Diameter of Ditto.	Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinder.	Diameter of Ditto	Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinder.	Diameter of Ditto.
20	400	2800	1800	43¼	1600	40	1400	37½	1244	35¼	1120	33½	1014	31¼	933	30¼	861	29	800	28¼	740	27¼	700	26½
21	441	3087	2058	45¼	1764	42	1543	39¼	1372	37	1234	35	1122	33½	1029	32	949	30½	882	29½	822	28½	771	27¾
22	484	3388	2258	47½	1936	44	1694	41	1505	38¾	1355	36¾	1232	35	1129	33½	1042	32	968	31	900	30	837	29
23	529	3703	2469	49½	2116	46	1851	43	1645	40½	1481	38½	1346	36½	1234	35	1139	33½	1058	32½	987	31½	925	30¼
24	576	4032	2688	51¾	2304	48	2016	45	1792	42	1612	40	1466	38¼	1344	36½	1240	35	1152	34	1075	32¾	1008	31¾
25	625	4375	2916	54	2500	50	2187	46¾	1944	43½	1750	41¾	1590	40	1458	38	1346	36½	1250	35¼	1166	34	1093	32¾
26	676	4732	3154	56	2704	52	2366	48½	2103	46	1892	43½	1720	41½	1576	39½	1456	38	1350	36¾	1261	35½	1183	34
27	729	5103	3402	58¼	2916	54	2551	50½	2268	47½	2041	45¼	1855	43	1701	41	1570	39½	1458	38	1360	37	1275	35½
28	784	5488	3658	60½	3136	56	2744	52½	2439	49¼	2195	46¾	1995	44½	1829	42¾	1688	41	1568	39½	1463	38¼	1372	36¼
29	841	5887	3924	62½	3364	58	2943	54¼	2616	51½	2354	48½	2140	46	1962	44¼	1811	42½	1682	41	1569	39½	1471	38¼
30	900	6300	4200	64¾	3600	60	3150	56	2800	53	2520	50¼	2290	47½	2100	45¾	1938	44	1800	42½	1680	41	1575	39½
31	961	6727	4484	67	3844	62	3365	58	2989	54½	2690	51¾	2446	49	2242	47¼	2069	45½	1920	44	1793	42¼	1681	41
32	1024	7168	4778	69¼	4096	64	3584	59¾	3185	56¼	2867	53½	2605	50¾	2389	48¾	2205	47	2048	45¼	1911	43¾	1792	42¼
33	1089	7623	5080	71¼	4356	66	3811	61¾	3388	58	3049	55	2772	52½	2541	50½	2345	48½	2178	46½	2032	45	1905	43½
34	1156	8092	5394	73¾	4624	68	4046	63¾	3596	59½	3236	56¾	2942	54¼	2697	52	2489	50	2312	48	2157	46½	2023	44¾
35	1225	8575	5716	75½	4900	70	4287	65½	3811	61¼	3430	58¼	3118	56	2858	53½	2638	51½	2450	49½	2286	47¾	2143	46¼
36	1296	9072	6048	77¾	5184	72	4536	67¼	4032	63¾	3628	60¼	3299	57½	3024	55	2791	53	2592	51	2419	49¼	2268	47½
37	1349	9583	6388	80	5476	74	4791	69	4259	65¼	3833	62	3484	59	3194	56½	2948	54½	2738	52½	2555	50½	2395	49
38	1444	10108	6738	82	5776	76	5054	71	4491	67	4043	63½	3675	60½	3369	58	3110	56	2888	53¾	2695	52	2527	50¼
39	1521	10647	7098	84¼	6084	78	5323	73	4732	68¾	4258	65¼	3872	62	3549	59½	3276	57¼	3042	55	2839	53¼	2661	51½
40	1600	11200	7466	86½	6400	80	5600	75	4977	70½	4480	67	4072	63½	3733	61	3446	58¾	3200	56½	2986	54¾	2880	52¾
41	1681	11767	7844	88½	6724	82	5883	76¾	5229	72¼	4706	68¼	4278	65¼	3922	62½	3620	60¼	3360	58	3137	56	2941	54¼
42	1764	12348	8232	90½	7056	84	6174	78½	5488	74	4939	70¼	4490	67	4116	64	3799	61¾	3528	59½	3292	57½	3087	55½
43	1849	12943	8628	92¾	7396	86	6471	80½	5752	75¾	5177	72	4706	68½	4314	65½	3982	63	3698	62¼	3451	58¾	3235	57
44	1936	13552	9034	95	7744	88	6776	82½	6023	77½	5420	73½	4928	70	4517	67	4169	64½	3872	62½	3613	60	3388	58¼
45	2025	14175	9430	97¼	8100	90	7087	84¼	6300	79¾	5670	75¼	5154	71½	4725	68½	4361	66	4050	63¾	3780	61½	3543	59½
46	2116	14812	9874	99½	8464	92	7406	86	6583	81	5924	77	5386	73¾	4937	70	4557	67½	4232	65	3949	62¾	3703	60¾
47	2209	15463	10308	101½	8836	94	7731	88	6872	82¾	6183	78½	5622	75	5154	71¾	4757	69	4418	66½	4123	64¼	3865	62
48	2304	16128	10752	103¾	9216	96	8064	89¾	7168	84¾	6451	80¼	5864	76½	5376	72¾	4962	70½	4608	68	4300	65¾	4032	63½
49	2401	16807	11204	106	9604	98	8403	91¾	7469	86¾	6723	82	6111	78	5602	74¾	5171	72	4802	69½	4481	67	4201	64¾
50	2500	17500	11666	108	10000	100	8750	93½	7777	88	7000	83½	6363	79½	5833	76½	5384	73½	5000	70¾	4666	68½	4375	66¼
51	2601	18207	12137	110¼	10404	102	9103	95½	8092	90	7283	85¼	6620	81½	6069	78	5602	75	5202	72	4855	70	4551	67½
52	2704	18928	12616	112¼	10816	104	9464	97¼	8412	91¾	7571	87	6882	83	6309	79½	5824	76½	5408	73½	5047	71½	4782	68¾
53	2809	19663	13110	114½	11236	106	9830	99¼	8739	93½	7865	88¾	7150	84½	6554	81	6059	78	5618	75	5243	73	4915	70
54	2916	20412	13608	116½	11664	108	10206	101	9072	95¼	8164	90¼	7420	86	6804	82½	6288	79¼	5832	76½	5444	74¼	5103	71¼
55	3025	21175	14112	118½	12100	110	10587	103	9411	97	8470	92	7700	87½	7056	84	6515	80	6050	78	5646	75½	5292	72½
56	3136	21952	14624	121	12544	112	10976	104½	9756	98¾	8780	93½	7982	89½	7317	85½	6754	81¼	6272	79½	5854	76¾	5488	74
57	3249	22743	15162	123¼	12996	114	11371	106	10108	100½	9097	95¼	8270	90¾	7581	87	6997	83¾	6498	80½	6064	78	5685	75¼
58	3364	23548	15690	125¼	13456	116	11774	108½	10465	102	9419	97	8560	92½	7848	88½	7245	85	6728	82	6279	79¼	5887	76¾
59	3481	24367	16244	127	13924	118	12183	110¼	10829	104	9746	98¾	8856	94	8122	90	7497	86½	6962	83½	6497	80½	6091	78
60	3600	25200	16800	129½	14400	120	12600	112¼	11200	105¼	10080	100	9160	95¾	8400	91½	7764	88	7200	85	6720	82	6300	79½
61	3721	26047	17364	131¾	14884	122	13021	114	11557	107½	10413	102	9464	97¼	8676	93	8014	89½	7442	86½	6945	83¾	6511	80½
62	3844	26908	17936	134	15376	124	13454	116	11949	108¾	10758	103¾	9776	99	8960	94½	8279	91	7688	87½	7175	84	6727	82
63	3969	27783	18522	136	15876	126	13891	117¾	12348	111	11113	105¼	10102	100½	9261	96	8545	92½	7938	90	7406	86	6945	83¼
64	4096	28672	19114	138¼	16384	128	14336	119¾	12744	113	11468	107	10424	102	9557	97¾	8822	94	8192	90½	7645	87¼	7168	84½
65	4225	29575	19716	140	16900	130	14787	121½	13144	114¾	11830	108¾	10750	103¾	9856	99	9100	95½	8451	92	7886	88	7392	86
66	4356	30492	20328	142¼	17424	132	15246	123½	13552	116½	12196	110	11088	105	10164	100¾	9382	97	8712	93¾	8130	90¼	7623	87¼
67	4489	31423	20948	144½	17956	134	15711	125¾	13965	118¼	12569	112	11432	107	10474	102	9669	98¼	9978	94	8379	91½	7855	88½
68	4624	32368	21578	146¾	18496	136	16184	127¼	14385	120	12947	114	11770	108½	10816	104	9996	99½	9244	96	8659	93	8120	90
69	4761	33327	22218	149	19044	138	16660	129	14812	121½	13333	115½	12120	110	11109	105½	10254	101¼	9522	97½	8888	94¼	8333	91¼
70	4900	34300	22866	151	19600	140	17150	131	15244	123½	13720	117	12473	111	11433	107	10553	102	9800	99	9146	95½	8575	92½

TABLE IV. of the Powers of Steam Engines working at the Rate of 8lbs. Avoirdupoiſe, upon every Circular Inch, or 10.18 lbs. upon every Square Inch of the Steam Piſton, applicable to Blowing Machinery; and the Areas and Diameters of Blowing Cylinders requiſite to raiſe Air of various Denſities from 1½ lb. to 4 lbs. upon each Circular Inch, or from 1.90 lb. to 5.092 lbs. Avoirdupoiſe upon each Square Inch of the Air Receiver.

Diameters of Steam Cylind.	Area of Ditto.	Power of the Engine in Pounds.	Blaſt 1½ lb. per Circular Inch, or 1.90 lb. per Square Inch.		Blaſt 1¾ lb. per Circular Inch, or 2.22 lb. per Square Inch.		Blaſt 2 lb. per Circular Inch, or 2.54 lb. per Square Inch.		Blaſt 2¼ lb. per Circular Inch, or 2.86 lb. per Square Inch.		Blaſt 2½ lb. per Circular Inch, or 3.18 lb. per Square Inch.		Blaſt 2¾ lb. per Circular Inch, or 3.49 lb. per Square Inch.		Blaſt 3 lb. per Circular Inch, or 3.81 lb. per Square Inch.		Blaſt 3¼ lb. per Circular Inch, or 4.13 lb. per Square Inch.		Blaſt 3½ lb. per Circular Inch, or 4.45 lb. per Square Inch.		Blaſt 3¾ lb. per Circular Inch, or 4.77 lb. per Square Inch.		Blaſt 4 lb. per Circular Inch, or 5.09 lb. per Square Inch.	
			Area of Blowing Cylinder.	Diameter of Ditto.	Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinders	Diameter of Ditto	Area of Blowing Cylinder.	Diameter of Ditto.	Area of Blowing Cylinder	Diameter of Ditto.	Area of Blowing Cylinder	Diameter of Ditto.	Area of Blowing Cylinder.	Diameter of Ditto.	Area of Blowing Cylinder	Diameter of Ditto.	Area of Blowing Cylinder.	Diameter of Ditto.	Area of Blowing Cylinder	Diameter of Ditto.	Area of Blowing Cylind.	Diameter of Ditto.
20	400	3200	2133	46¼	1828	42¾	1600	40	1422	37¾	1280	36	1163	34	1066	32½	984	31¼	914	30	853	29	800	28¼
21	441	3528	2352	48½	2016	45	1764	42	1568	39½	1412	37½	1282	35¾	1176	34	1085	33	1008	31½	940	30½	882	29½
22	484	3872	2581	50¾	2212	47	1936	44	1720	41½	1548	39½	1408	37½	1290	35¾	1191	34½	1106	33	1032	32	968	31
23	529	4232	2821	53	2418	49	2116	46	1880	43¼	1692	41	1538	39	1410	37½	1302	36	1209	34½	1128	33½	1058	32¼
24	576	4608	3072	55½	2633	51¼	2304	48	2048	45¼	1845	43	1675	41	1536	39	1417	37½	1316	36¼	1228	35	1152	33½
25	625	5000	3333	57¾	2857	53¼	2500	50	2222	47	2000	44¾	1818	42½	1666	40¾	1538	39	1428	37¾	1333	36½	1250	35
26	676	5408	3605	60	3090	55¼	2704	52	2403	48¾	2163	46½	1966	44½	1802	42¾	1664	40¾	1545	39¼	1442	38	1352	36¼
27	729	5832	3886	62¼	3332	57½	2916	54	2592	50½	2332	48¼	2120	46	1944	44	1794	42¼	1666	40¾	1555	39½	1458	37½
28	784	6272	4181	64½	3584	59½	3136	56	2787	52½	2508	50	2280	47¾	2090	45¾	1929	44	1792	42¼	1672	41	1568	39¼
29	841	6728	4485	67	3844	61¾	3364	58	2990	54½	2691	51¾	2446	49¼	2242	47½	2069	45½	1922	43¾	1794	42½	1682	41
30	900	7200	4800	69¼	4114	64	3600	60	3200	56½	2880	53¾	2618	51	2400	49	2215	47	2057	45¼	1920	44	1800	42½
31	961	7688	5123	71½	4393	66	3844	62	3417	58½	3075	55½	2795	52¾	2562	50½	2365	48½	2196	46¾	2050	45¼	1922	43¾
32	1024	8192	5461	74	4681	68¼	4096	64	3640	60½	3276	57¼	2980	54½	2730	52¼	2520	50	2340	48¼	2184	46½	2048	45¼
33	1089	8712	5808	76½	4978	70¼	4356	66	3872	62½	3484	59	3168	56¼	2904	54	2680	51½	2489	50	2323	48	2178	46½
34	1156	9248	6165	78½	5284	72½	4624	68	4110	64¼	3699	60¾	3362	58	3082	55½	2845	53	2642	51½	2466	49½	2312	48
35	1225	9800	6533	81	5600	74¾	4900	70	4355	66	3920	62½	3563	59¾	3266	57	3015	54½	2800	53	2613	51	2450	49½
36	1296	10368	6912	83½	5924	77	5184	72	4608	68	4147	64½	3770	61½	3456	58¾	3190	56¼	2962	54½	2764	52½	2592	51
37	1369	10952	7301	85¾	6258	79¼	5476	74	4867	69¾	4380	66½	3982	63	3650	60¼	3308	58	3129	56	2920	53½	2738	52¼
38	1444	11552	7713	87¾	6601	80¾	5776	76	5134	71½	4620	68	4200	64½	3850	62	3554	59½	3300	57½	3080	55¼	2888	53½
39	1521	12168	8112	90	6953	83	6084	78	5408	73¼	4867	69¾	4424	66½	4056	63½	3744	61	3476	59	3244	57	3042	54¾
40	1600	12800	8533	92¼	7314	85¼	6400	80	5688	75¼	5120	71½	4654	68¼	4266	65½	3938	62½	3657	60½	3413	58½	3200	56¼
41	1681	13448	8965	94½	7684	87½	6724	82	5976	77¼	5379	73½	4890	70	4462	66¾	4137	64	3842	62	3586	59¾	3362	58
42	1764	14112	9408	97	8064	89¾	7056	84	6272	79¼	5644	75	5131	71¼	4704	68½	4342	65½	4032	63½	3763	61¼	3528	59¼
43	1849	14792	9861	99¼	8453	92	7396	86	6574	81	5919	76½	5378	73¼	4930	70¾	4520	67¼	4226	65	3944	62¾	3698	60¾
44	1936	15488	10325	101½	8450	94	7744	88	6883	83	6195	78½	5632	75	5162	71¾	4765	69	4425	66½	4130	64	3872	62½
45	2025	16200	10800	104	9257	96¼	8100	90	7200	85	6400	80½	5890	76½	5400	73½	4984	70½	4628	68	4320	65¾	4050	63½
46	2116	16928	11285	106¼	9673	98½	8464	92	7523	86¾	6771	82½	6153	78½	5642	75	5208	72¼	4836	69½	4514	67	4232	65
47	2209	17672	11781	108½	10098	100¼	8836	94	7854	88½	7068	84	6420	80	5890	76½	5437	73¾	5049	71	4712	68½	4418	66½
48	2304	18432	12288	110¾	10532	102¼	9216	96	8192	90¼	7372	85½	6702	81¾	6144	78	5671	75½	5266	72½	4915	70	4608	68
49	2401	19208	12805	113¼	10976	104½	9604	98	8536	92	7683	87½	6984	83½	6402	80	5910	77	5488	74	5122	71½	4802	69½
50	2500	20000	13333	115½	11428	106½	10000	100	8888	94	8000	89½	7272	85¼	6666	81¾	6153	78½	5714	75½	5333	73	5000	71
51	2601	20808	13872	117½	11888	109	10404	102	9248	96¼	8323	91¾	7566	87	6936	83¾	6403	80	5945	77	5548	74½	5202	72¼
52	2704	21632	14421	120	12391	111	10816	104	9614	98	8652	93	7866	88¾	7210	85	6656	81½	6180	78½	5768	76	5408	73½
53	2809	22472	14981	122½	12841	113½	11236	106	9987	100	8988	94¾	8135	90¼	7490	86½	6914	83	6420	80	5992	77½	5616	75
54	2916	23328	15552	124½	13330	115½	11664	108	10368	101¾	9331	96½	8482	92	7776	88¼	7116	84½	6665	81½	6220	79	5832	76½
55	3025	24200	16133	127	13828	117½	12100	110	10755	103½	9680	98	8800	93¾	8066	89¾	7446	86½	6914	83	6453	80½	6050	78
56	3136	25088	16725	129¼	14336	119½	12544	112	11155	105¼	10035	100	9122	95½	8362	91½	7719	87¾	7168	84½	6690	82	6272	79¼
57	3249	25992	17328	131½	14852	121¾	12996	114	11552	107½	10396	101¾	9451	97¼	8664	93	7997	89¼	7426	86	6931	83¼	6408	80½
58	3364	26912	17940	134	15378	124	13456	116	11960	109½	10764	103½	9786	98¾	8970	94½	8280	91	7689	87½	7176	84½	6728	82
59	3481	27848	18565	136¼	15908	126	13924	118	12376	111¾	11139	105½	10126	100	9282	96¼	8568	92½	7956	89	7426	86	6962	83½
60	3600	28800	19200	138½	16457	128¼	14400	120	12800	113	11520	107½	10472	102½	9600	98	8861	94½	8228	90½	7680	87½	7200	85
61	3721	29768	19845	140¾	17010	130½	14884	122	13230	114¾	11907	109	10824	104	9922	99¾	9159	95½	8505	92	7938	89	7442	86¼
62	3844	30752	20381	142¾	17572	132¾	15376	124	13676	117	12308	111	11182	105½	10250	101¼	9462	97¼	8786	93½	8200	90½	7688	87½
63	3969	31752	21168	145	18144	134¾	15876	126	14112	119	12702	112¾	11454	107½	10584	102¾	9769	98¾	9072	95¼	8467	92	7938	89
64	4096	32768	21845	147¼	18724	136¾	16384	128	14563	120¾	13107	114½	11912	109	10922	104½	10082	100¼	9362	96¾	8738	93½	8192	90½
65	4225	33800	22533	149½	19314	139	16900	130	15023	122½	13520	116¼	12292	110¾	11266	106½	10400	102	9657	98¼	9014	95	8450	92
66	4356	34848	23232	152	19904	141	17424	132	15488	124	13939	118	12672	112¼	11614	107¾	10722	103½	9956	99½	9292	96½	8712	93½
67	4489	35912	23941	154½	20521	143¼	17956	134	15960	126¼	14364	119¾	13058	114	11970	109½	11049	105	10260	101¼	9576	98	8978	95
68	4624	36992	24661	157	21138	145½	18496	136	16440	128	14796	121½	13451	116	12330	111	11382	106½	10569	103	9864	99¼	9248	96¼
69	4761	38088	25392	159½	21764	147½	19044	138	16924	130	15235	123¾	13847	117¾	12696	112¾	11719	108¼	10882	104½	10156	100½	9522	97½
70	4900	39200	26133	162	22400	149½	19600	140	17422	132	15680	125¼	14254	118½	13066	114½	12061	110	11200	106	10453	102¼	9800	99

TABLE V. of the Powers of Steam Engines working at the Rate of 9lbs. Avoirdupoise, upon every Circular Inch, or 11.45lb. upon every Square Inch of the Steam Piston applicable to Blowing Machinery; and the Areas and Diameters of Blowing Cylinders requisite to raise Air of various Densities from 1½lb. to 4lbs. upon each Circular Inch, or from 1.90lb. to 5.09lbs. Avoirdupoise, upon each Square Inch of the Air Receiver.

Diameter of Steam Cylin.	Areas of Ditto.	Power of the Engine in Pounds.	Blast 1½lb. per Cir. Inch, or 1.90 per Square Inch.		Blast 1¾lb. per Cir. Inch, or 2.20 per Square Inch.		Blast 2lb. per Cir. Inch, or 2.54 per Square Inch.		Blast 2¼lb. per Cir. Inch, or 2.86 per Square Inch.		Blast 2½lb. per Cir. Inch, or 3.18 per Square Inch.		Blast 2¾lb. per Cir. Inch, or 3.49 per Square Inch.		Blast 3lb. per Cir. Inch, or 3.81 per Square Inch.		Blast 3¼lb. per Cir. Inch, or 4.13 per Square Inch.		Blast 3½lb. per Cir. Inch, or 4.45 per Square Inch.		Blast 3¾lb. per Cir. Inch, or 4.77 per Square Inch.		Blast 4lb. per Cir. Inch, or 5.09lb. per Square Inch.	
			Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinder	Diameter of Ditto	Area of Blowing Cylinder	Diameter of Ditto
20	400	3600	2400	49	2057	45½	1800	42½	1600	40	1440	37½	1309	36	1200	34¾	1107	33¼	1028	32	960	3	900	30
21	441	396[illegible]	2646	51½	2268	47½	1984	44½	1764	42	1587	39½	1443	38	1323	36½	1221	35	1134	33½	1058	32½	992	31½
22	484	435[illegible]	2904	54	2489	49½	2178	46½	1936	44	1742	41½	1584	40	1452	38	1340	36½	1244	35	1161	34	1089	33
23	529	4761	3174	56½	2720	52	2380	48¾	2116	46	1904	43½	1731	41½	1587	39½	1464	38¼	1360	36¾	1269	35½	1190	34½
24	576	5184	3456	59	2963	54½	2592	50¾	2304	48	2074	45½	1885	43½	1728	41¼	1593	39	1480	38½	1382	37	1296	36
25	625	5625	3750	61½	3214	56¾	2812	53	2500	50	2250	47½	2045	45¼	1875	43¼	1730	41½	1607	40	1500	38½	1406	37½
26	676	6084	4056	64	3476	59	3042	55	2704	52	2433	49¼	2212	47	2028	45	1872	43¼	1738	41½	1622	40	1521	39
27	729	6561	4374	66½	3749	61	3280	57	2916	54	2628	51	2389	48½	2187	46½	2018	45	1874	43¼	1749	41½	1640	40½
28	784	7056	4704	68½	4032	63½	3528	59½	3136	56	2822	53	2565	50½	2352	48½	2170	46½	2016	45	1888	43½	1764	42
29	841	7569	5046	71	4325	65¾	3784	61½	3364	58	3027	55	2752	52½	2523	50¼	2322	48¼	2156	46½	2018	45	1892	43½
30	900	8100	5400	73½	4628	68	4050	63½	3600	60	3240	57	2945	54½	2700	52	2492	50	2316	48	2160	46½	2025	45
31	961	8640	5766	76	4922	70¼	4324	65¾	3844	62	3450	58¾	3145	56	2883	53¾	2661	51½	2471	49¾	2306	48	2162	46½
32	1024	9216	6144	78½	5264	72½	4608	68	4096	64	3686	60½	3351	58	3072	55½	2835	53½	2633	51	2457	49½	2304	48
33	1089	9801	6534	81	5600	74¾	4900	70	4356	66	3920	62½	3564	59¾	3267	57¼	3016	55	2802	53	2613	51	2450	49½
34	1156	10404	6936	83¼	5945	77	5202	72	4624	68	4161	64½	3783	61½	3468	59	3201	56¾	2972	54½	2774	52¾	2601	51
35	1225	11025	7350	85½	6300	79½	5512	74¼	4900	70	4410	66½	4009	63¼	3675	[illegible]	3392	58½	3150	56	2940	54½	2756	52½
36	1296	11664	7776	89	6665	81¾	5832	76¼	5184	72	4669	68¼	4241	65	3888	62½	3588	59¾	3333	57¾	3110	56	2916	54
37	1369	12321	8214	90½	7040	84	6160	78½	5476	74	4928	70	4480	67	4107	64	3791	61½	3520	59½	3285	57¾	3080	55½
38	1444	12996	8664	93	7426	86¼	6498	80½	5776	76	5198	72	4725	68¾	4332	65	3998	63	3712	61	3465	59	3249	57
39	1521	13689	9126	95½	7822	88½	6844	82	6084	78	5476	74	4977	70½	4563	67½	4212	65	3911	62½	3650	60½	3422	58½
40	1600	14400	9600	98	8228	90¾	7200	85	6400	80	5760	76	5236	72¾	4800	69¼	4430	66½	4114	64	3840	62	3600	60
41	1681	15129	10086	100½	8645	93	7564	87	6724	82	6051	78	5501	74¾	5040	71	4655	68¼	4322	65½	4034	63½	3782	61½
42	1764	15876	10584	103	9072	95¼	7938	89	7056	84	6350	79¾	5773	76	5292	72¾	4884	69¾	4536	67	4231	65	3969	63
43	1849	16641	11094	105½	9509	97½	8320	91¼	7396	86	6656	81½	6051	78	5547	74½	5120	71½	4754	69	4437	66½	4160	64½
44	1936	17424	11616	107¾	9956	99¾	8712	93½	7744	88	6969	83½	6336	79¾	5808	76¼	5361	73¼	4978	70½	4646	68	4356	66
45	2025	18225	12150	110¼	10414	102	9112	95½	8100	90	7290	85¼	6620	81½	6075	78	5607	75	5207	72	4860	69½	4556	67½
46	2116	19044	12696	112¾	10888	104¼	9522	97	8464	92	7617	87	6925	83¾	6348	79½	5859	76½	5441	73½	5078	71¼	4761	69
47	2209	19881	13254	115	11368	106½	9940	99½	8836	94	7952	89¼	7229	85	6627	81¼	6117	78¼	5680	75	5301	73	4970	70½
48	2304	20736	13824	117½	11849	108¾	10368	101½	9216	96	8294	91	7540	87	6912	83	6380	80	5923	77	5529	74½	5184	72
49	2401	21609	14406	120	12348	111¼	10804	104	9604	98	8643	93	7857	88¾	7203	84	6648	81¾	6174	78½	5762	76	5402	73½
50	2500	22500	15000	122½	12857	113½	11250	106	10000	100	9000	95	8181	90½	7500	86½	6923	83¼	6428	80	6000	77½	5625	75
51	2601	23409	15606	125	13376	115¾	11704	108¼	10404	102	9360	96¾	8511	92½	7800	88¾	7202	85	6688	81¾	6242	79	5852	76½
52	2704	24336	16224	127½	13896	118	12168	110¼	10816	104	9734	98½	8849	94	8112	90	7488	86½	6953	83½	6489	80½	6084	78
53	2809	25281	16854	129¾	14446	120¼	12640	112½	11232	106	10112	100½	9193	95¾	8427	91½	7778	88¼	7223	85	6741	82	6320	79½
54	2916	26244	17496	132¼	14996	122½	13122	114½	11664	108	10497	102½	9543	97½	8748	93½	8075	90	7498	86½	6998	83¾	6561	81
55	3025	27225	18150	134½	15557	125	13612	116¾	12100	110	10890	104½	9900	99½	9075	95¼	8376	91¾	7778	88¼	7260	85½	6806	82½
56	3136	28224	18816	137	16128	127	14112	118¾	12544	112	11289	106	10263	101¼	9408	97	8684	93½	8064	89¾	7526	87	7056	84
57	3249	29241	19494	139½	16709	129¼	14620	121	12996	114	11696	108¼	10633	103	9747	98¾	8997	94¾	8354	91½	7797	88½	7310	85½
58	3364	30276	20184	142	17300	131½	15138	123	13456	116	12111	110	11009	105	10092	100¼	9315	96½	8650	93	8073	90	7569	87
59	3481	31329	20886	144½	17902	133¾	15664	125¼	13924	118	12531	112	11392	106¾	10444	102¼	9637	98¼	8951	94½	8357	91½	7832	88½
60	3600	32400	21600	147	18514	136	16200	127½	14400	120	12960	114	11781	108½	10800	104	9969	99	9257	96¼	8640	93	8100	90
61	3721	33489	22326	149½	19136	138¼	16744	129½	14884	122	13395	115¼	12177	110½	11163	105¾	10304	101½	9568	97¾	8930	94½	8372	91½
62	3844	34596	23064	152	19769	140½	17298	131½	15376	124	13837	117½	12578	112¼	11532	107½	10644	103¾	9884	99½	9225	96	8649	93
63	3969	35721	23814	154½	20412	142¾	17860	133¾	15876	126	14292	119½	12989	114	11907	109	10990	104¼	10206	101	9525	97½	8930	94½
64	4096	36864	24576	157	21056	145	18432	135¾	16384	128	14745	121½	13405	115¾	12288	111	11342	106½	10532	102½	9830	99	9216	96
65	4225	38025	25350	158½	21728	147¼	19012	138	16900	130	15210	123½	13827	117½	12675	112½	11697	108	10764	104	10140	100½	9506	97½
66	4356	39204	26136	161	22404	149½	19602	140	17424	132	15681	125¼	14256	119¼	13068	114¾	12062	109¾	11201	106	10454	102	9801	99
67	4489	40401	26934	163½	23086	151¾	20202	142¼	17956	134	16160	127¼	14691	121	13467	116	12431	111½	11543	107½	10777	103½	10100	100½
68	4624	41616	27744	166	23777	154	20808	144¼	18496	136	16640	129	15133	123	13872	117	12854	113	11928	109	11097	105	10404	102
69	4761	42849	28566	169	24485	156½	21424	146½	19044	138	17139	130¾	15578	124	14283	119	13181	114	12244	110½	11426	106¾	10712	103½
70	4900	44100	29400	172	25200	158½	22050	148½	19600	140	17640	132¾	16036	126¾	14700	121¼	13569	116½	12600	112¾	11760	108½	11025	105

TABLE VI. of the Powers of Steam Engines working at the Rate of 10lbs. Avoirdupoise upon every Circular Inch, or 12.73 lbs. upon every Square Inch of the Steam Piston applicable to Blowing Machinery; and the Areas and Diameters of Blowing Cylinders requisite to raise Air of various Densities from 1½lb. to 4lbs. Avoirdupoise upon each Circular Inch, or from 1.90lb. to 5.092lbs. upon each Square Inch of the Air Receiver.

Diameter of Steam Cylin.	Areas of Ditto.	Power of the Engine in Pounds.	Blast 1.90 lb. per Circular Inch, or 2.42 lb. per Square Inch.		Blast 1½ lb. per Circular Inch, or 2.22 lb. per Square Inch.		Blast 2 lb. per Circular Inch, or 2.54 lb. per Square Inch.		Blast 2½ lb. per Circular Inch, or 2.86 lb. per Square Inch.		Blast 2½ lb. per Circular Inch, or 3.18 lb. per Square Inch.		Blast 2¾ lb. per Circular Inch, or 3.41 lb. per Square Inch		Blast 3 lb. per Circular Inch, or 3.81 lb. per Square Inch.		Blast 3½ lb. per Circular Inch, or 3.81 lb. per Square Inch.		Blast 3¾ lb. per Circular Inch, or 4.45 lb. per Square Inch.		Blast 4 lb. per Circular Inch, or 4.77 lb. per Square Inch.		Blast 4½ lb. per Circular Inch, or 5.09 lb. per Square Inch.	
			Area of blowing Cylinder.	Diameter of Ditto.	Area of blowing Cylinder.	Diameter of Ditto.	Area of blowing Cylinder.	Diameter of Ditto.	Area of blowing Cylinder.	Diameter of Ditto.	Area of blowing Cylinder.	Diameter of Ditto.	Area of blowing Cylinder.	Diameter of Ditto.	Area of blowing Cylinder.	Diameter of Ditto.	Area of blowing Cylinder.	Diameter of Ditto.	Area of blowing Cylinder.	Diameter of Ditto.	Area of blowing Cylinder.	Diameter of Ditto.	Area of blowing Cylinder.	Diameter of Ditto.
20	400	4000	2666	51½	2285	47	2000	44¾	1777	42	1600	40	1454	38	1333	36½	1230	35	1142	34	1066	32½	1000	31¼
21	441	4410	2940	54	2520	50¼	2205	47	1960	44¼	1764	42	1603	40	1470	38¼	1356	36¼	1260	35½	1176	34¼	1102	33½
22	484	4840	3226	57	2765	52½	2420	49½	2151	46¾	1936	44	1760	42	1613	40	1489	38½	1382	37	1290	36	1210	35
23	529	5290	3526	59½	3022	55	2645	51¼	2351	48½	2116	46	1923	44	1763	42	1627	40¼	1511	38¾	1410	37½	1322	36½
24	576	5760	3840	62	3291	57¼	2880	53½	2560	50½	2304	48	2094	43¾	1920	44	1772	42	1645	40½	1536	39¼	1440	38
25	625	6250	4160	64½	3571	59½	3125	56	2777	52½	2500	50	2272	47	2083	45½	1923	44	1785	42	1666	40¾	1562	39½
26	676	6760	4500	67	3862	62	3380	58¼	3004	55¾	2704	52	2458	49	2253	47½	2080	45½	1931	44	1802	42½	1690	41
27	729	7290	4860	69½	4165	64¼	3645	60½	3240	57	2916	54	2650	51¼	2430	49¼	2245	47½	2082	45½	1944	44	1822	42½
28	784	7840	5226	72	4480	67	3920	62½	3484	59	3136	56	2850	53¼	2613	51	2414	49	2240	47¼	2090	45½	1960	44
29	841	8410	5606	74½	4805	69½	4205	64¾	3737	61	3364	58	3058	55¼	2803	53	2587	50¾	2402	49	2242	47¼	2102	45½
30	900	9000	6000	77½	5142	71¾	4500	67	4000	63	3600	60	3272	57¼	3000	54¾	2769	52½	2571	50¾	2400	49	2250	47
31	961	9610	6406	80	5491	74	4805	69½	4271	65¼	3844	62	3494	59	3203	56½	2958	54¼	2745	52¼	2562	50½	2402	49
32	1024	10240	6826	82½	5851	76½	5120	71½	4560	67½	4096	64	3723	61	3413	58½	3150	56	2925	54	2730	52¼	2560	50¾
33	1089	10890	7260	85¼	6222	79	5495	74	4842	69½	4356	66	3960	63	3630	60¼	3350	58	3111	55¾	2904	54	2722	52¼
34	1156	11560	7706	87	6605	81¼	5780	76	5137	71½	4624	68	4203	65	3853	62	3556	59½	3302	57½	3082	55½	2890	54
35	1225	12250	8166	90½	6999	83¾	6125	78¼	5444	73¾	4900	70	4454	67	4083	64	3781	61½	3500	59½	3266	57	3062	55½
36	1296	12960	8640	93	7405	86	6480	80½	5760	76	5184	72	4712	68¾	4320	65¾	3987	63	3702	61	3456	58¾	3240	57
37	1369	13690	9126	95½	7822	88½	6845	83	6084	78	5476	74	4978	70½	4563	67½	4212	65	3911	62¾	3650	60½	3422	58½
38	1444	14440	9626	98	8251	90¾	7220	85	6417	80	5776	76	5250	72¼	4813	69½	4443	66¾	4125	64	3850	62	3610	60
39	1521	15210	10140	100½	8691	93¼	7605	87½	6760	82¼	6084	78	5530	74½	5070	71¼	4680	68¼	4345	66	4056	63¾	3802	61½
40	1600	16000	10666	103	9142	95½	8000	89½	7111	84¼	6400	80	5818	76½	5333	73	4920	70	4571	67½	4266	65¼	4000	63
41	1681	16810	11026	105¾	9605	98	8405	91½	7471	86¼	6724	82	6112	78¼	5603	75	5172	72	4802	69½	4482	67	4202	64¾
42	1764	17640	11760	108½	10080	100¼	8820	94	7840	88½	7056	84	6414	80	5880	76¾	5427	73¼	5040	71	4704	68¾	4410	66½
43	1849	18490	12326	111	10565	102½	9245	96	8217	90¾	7396	86	6723	82	6163	78¾	5689	75¾	5282	72¾	4930	70¼	4622	68
44	1936	19360	12906	113½	11062	105	9680	98¼	8604	92¾	7744	88	7040	84	6453	80¾	5956	77¼	5531	74¼	5162	72	4840	69½
45	2025	20250	13500	116¼	11571	107½	10125	100½	9000	95	8100	90	7363	85¾	6750	82	6220	79	5785	76	5400	73½	5062	71
46	2116	21160	14106	118¾	12091	110	10580	102½	9404	97	8464	92	7694	87½	7053	84	6510	80½	6045	77¼	5642	75¼	5290	72½
47	2209	22090	14726	121½	12622	112½	11045	105	9817	99	8836	94	8032	89½	7363	86	6798	82½	6311	79½	5890	76¾	5522	74¾
48	2304	23040	15360	124	13166	114¾	11520	107	10244	101¼	9216	96	8378	91½	7680	87	7089	84¼	6582	81	6144	78½	5760	76½
49	2401	24010	16006	126½	13720	117	12005	109½	10671	103¼	9605	98	8730	93½	8003	89½	7387	86	6860	82½	6402	80	6005	77¾
50	2500	25000	16666	129	14285	119½	12500	111¾	11111	105¼	10000	100	9090	95¼	8333	91¼	7692	87¾	7142	84½	6666	81½	6250	79
51	2601	26010	17340	131½	14862	122	13005	114	11560	107½	10404	102	9458	97¼	8670	93	8003	89½	7431	86	6936	83¼	6502	80¼
52	2704	27040	18026	134	15451	124½	13520	116¼	12017	109½	10816	104	9832	99	9013	95	8320	91¼	7725	87¾	7210	85	6760	82½
53	2809	28090	18726	136¾	16051	126¾	14045	118½	12484	111¾	11236	106	10214	101	9363	96¾	8643	93	8025	89½	7490	86½	7022	84
54	2916	29160	19440	139¼	16662	129	14580	120¾	12960	113¾	11664	108	10603	103	9720	98½	8972	94¾	8331	91½	7776	88¼	7290	85½
55	3025	30250	20166	142	17285	131½	15125	123	13444	116	12100	110	11000	105	10083	100¼	9307	96	8642	93	8066	89¾	7562	87
56	3136	31360	20906	144½	17920	133¾	15680	125¼	13937	118	12544	112	11403	106¾	10453	102	9649	98¼	8956	94½	8362	91½	7840	88½
57	3249	32490	21660	147¼	18565	136¼	16245	127½	14440	120	12996	114	11814	108¾	10830	104	9997	100	9282	96½	8664	93	8122	90
58	3364	33640	22426	149	19222	138½	16820	129¾	14951	122	13456	116	12232	110¾	11214	106	10350	101¾	9611	98	8970	94¾	8410	91½
59	3481	34810	23206	152½	19891	141	17405	132	15472	124	13924	118	12658	112½	11603	107	10710	103½	9943	99½	9282	96½	8702	93
60	3600	36000	24000	155	20571	143¼	18000	134¼	16000	126¼	14400	120	13090	114½	12000	109	11077	105¼	10285	101¼	9600	98	9000	94¾
61	3721	37210	24806	157½	21262	145¾	18605	136¼	16537	128¾	14884	122	13530	116	12403	111¼	11449	107	10631	102¾	9922	99¾	9302	96¼
62	3844	38440	25626	160	21965	148¼	19220	138½	17084	130½	15376	124	13978	118	12813	113¼	11827	108½	10982	104¾	10250	100½	9610	98
63	3969	39690	26460	162½	22622	150½	19845	140¾	17640	132¾	15876	126	14433	120	13230	115	12212	110½	11340	106¼	10584	103	9922	99¾
64	4096	40960	27306	165¼	23405	153	20480	143	18204	135	16384	128	14894	122	13653	117	12605	112½	11702	108	10922	104½	10240	101¼
65	4225	42250	28166	167¾	24142	155¼	21125	145¼	18777	137	16900	130	15364	124	14083	118¾	13000	114	12071	109¾	12766	106	10562	102¾
66	4356	43560	29040	170½	24891	157½	21780	147¼	19360	139¼	17424	132	15840	126	14520	120½	13403	115¼	12445	111½	11616	107½	10890	104½
67	4489	44890	29926	173	25651	160¼	22445	149½	19995	141½	17956	134	16323	127½	14963	122¼	13812	117½	12825	113¾	11970	109¼	11222	106
68	4624	46240	30820	175½	26422	162¾	23120	152	20551	143½	18496	136	16814	129½	15413	124½	14227	119½	13211	115	12330	111	11560	107½
69	4761	47610	31740	178¼	27205	165	23805	154¼	21160	145½	19044	138	17309	131½	15870	126	14646	121	13602	116¾	12696	112¾	11902	109
70	4900	49000	32666	180½	28000	167½	24500	156½	21777	147½	19600	140	17818	133½	16333	128	15076	123	14000	118½	13066	114½	12250	110½

Blowing *of a Flower*, among *Florists*, an artificial process in order to bring a flower to display itself with greater perfection and beauty than it would arrive at in the natural way of blowing. The usual method is thus: about April, when the flower stems begin to put forth, or *spindle*, as the gardeners call it, they place by each flower a strait stick four feet long, and tie the spindles to it as they shoot. As soon as the flower-buds appear, they leave only one of the largest on each flower-stem to blossom. About ten days before the flowers open themselves, the round-podded kinds will begin to crack their husks on one side, when the careful gardener, with a fine needle, splits or opens the husk on the side opposite to the natural fraction; and about three or four days before the complete opening of the flower, cuts off with a pair of scissars the points on the top of the flower-pod, and supplies the vacancies or openings on each side of the husk with two small pieces of vellum or oil-cloth, slipped in between the flower-leaves and the inside of the husk; by such means, the blossom will display its parts equally on all sides, and be of a regular figure. Besides this care, when the blossom begins to shew its colours, they use to shade it from the extreme heat of the sun with a trencher-like board, or other device of the like nature, fastened to the stick which supports it; for the flowers as well as fruits, grow larger in the shade, and ripen and decay soonest in the sun.

In *Heraldry*, a fleur de lys is said to be blown, *espanoui*, when its leaves are opened, so that buds appear among the fleurons. The arms of the city of Florence are *argent, a fleur de lys blown, gules*.

Blowing-*snake*, in *Zoology*, a name given by the people of Virginia to a species of serpent much resembling the European viper, but considerably larger, and very remarkable for its inflating and extending the surface of its head before it bites. Its wound is very fatal.

BLOWN Red, in the manufacture of porcelane. See Red.

BLUBBER, in *Physiology* and *Trade*, the fat which invests the bodies of all large cetaceous fish, serving to furnish an oil.

The blubber is properly the *adeps* of the animal: it lies immediately under the skin, and over the muscular flesh. In the porpoise, it is firm and full of fibres, and invests the body about an inch thick. In the whale, its thickness is ordinarily six inches; but about the under lip, it is found two or three feet thick. The whole quantity yielded by one of these animals ordinarily amounts to forty or fifty, sometimes to eighty or more hundred weight. Phil. Trans. N° 77. p. 2275.

The use of the blubber to the animal seems to be partly to poise the body, and render it equiponderant to the water; partly to keep off the water at some distance from the blood, the immediate contact whereof would be apt to chill it; and partly also for the same use that cloaths serve us, to keep the fish warm, by reflecting or reverberating the hot steams of the body, and so redoubling the heat; since all fat bodies are, by experience, found less sensible of the impression of cold than lean ones.

Its use in trade and manufactures is to furnish train-oil, which it does by boiling down. Formerly this was performed ashore in the countries where the whales were caught; but of late the fishers do not go ashore, they bring the blubber home, stowed in casks, and boil it down there.

Blubber-*livers*. The livers of cods, which having been barrelled, yield spontaneously a considerable quantity of oil, which being skimmed off, the residue are called blubber-livers, to be boiled down for more oil.

Blubber, *sea*, a denomination given by our navigators to the *urtica marina*, or sea-nettle. Phil. Trans. N° 349.

BLUDENTZ, in *Geography*. See Pludentz.

BLUE, one of the seven primitive colours o the rays of light, into which they are divided, when refracted through a glass prism. See Colours, and Refraction.

Anciently blue was the symbol of the sea; for which reason, in the Circensian games, the combatants who represented the sea were clad in blue; and those who had distinguished themselves by any notable exploit at sea, were rewarded with a blue ensign.

Mr. Boyle has given us the following method of making transparent blue, nearly equal to ultramarine. The principal ingredient of this beautiful colour is the *cyanus*, or blue corn-bottle flower, which abounds almost in every corn-field, and may easily be had during four of the summer months. It may be gathered by children about the verges of corn-fields, without doing any damage to the corn This flower has two blues in it, one of a pale colour in the large outer leaves; and the other of a deeper blue, that lies in the middle of the flower. Both these will do, being separated from the buttons or cases in which they grow; but the deep blue leaves in the middle produce much the best colour: this may be observed by rubbing the leaves while they are fresh upon a piece of writing-paper, so hard as to express the juice which will yield an excellent colour, that by the experience of two or three years has not been found to fade. A sufficient quantity of these middle leaves being procured, let the juice be pressed from them; to which a little alum being added, will give a lasting transparent blue, scarcely inferior in brightness to ultramarine. It is very probable, that if the chives of these flowers were cured in the same manner with saffron, they would produce a much greater body of colour, from which a tincture might be drawn with more ease than when pressed fresh from the field.

Mr. Boyle also recommends another fine blue, produced from the blue leaves of rue beaten in a stone mortar with a wooden pestle, and then put in water for fourteen days or more, washing them every day until they are rotten. These beaten up at last, water and all, until they become a pulp, and then dried in the sun, will make a fine blue for shading.

Blue *Ashes, Cendres bleues*. See Verditer.

Blue *lice*, is a colour of good brightness, next to Prussian blue; it is also a colour of a body, and flows well from the pencil. See Bice.

Blue, in *Dyeing*. See Dyeing, Indigo, and Woad.

Blue *black*. See Black.

Blue *enamel*. See *Azure* Enamel.

Blue, *Flanders*, is a colour seldom used but in landscapes as being apt to turn green. The French call it *cendre verte*, or green ashes.

Blue *for painting or staining glass*. See Glass.

Blue *Japan*. See Japanning.

Blue *Indigo*. See Indigo.

Blue *Litmus*, or *Lacmus*. See Litmus.

Blue, *Painter's*, is made differently according to the different kinds of paintings. In limning, fresco, and miniature, they use indifferently ultramarine, blue ashes, and smalt; these are the natural blues, excepting the last, which is partly natural, partly artificial. See each under its proper head. In oil and miniature they use indigo, blue bice, blue verditer, lapis armenus, smalt, and litmus, also a counterfeit ultramarine. Enamellers and painters of glass have blues peculiar to themselves; each preparing them after his own manner. See Enamelling, *Painting on* Glass, and Neumann's Chem. Works, by Dr. Lewis.

Blue, *Prussian.* See Prussic *Acid.*

Blue, *Saxon,* a solution of indigo in sulphuric acid. See Indigo.

For an account of the processes for obtaining blue liquors from oak-dust and vitriol, from log wood and verdigrise, from log-wood and blue vitriol, from an essential oil and volatile spirit; see Dr. Lewis's Commercium Philosophico-Technicum, ed. 4to, ann. 1773, p. 382. 407. 436.

Blue, *Stone,* or *Powder,* used in washing of linen, is the same with smalt, either in the lump or powdered.

When the smalt is taken from the pot, it is thrown into a large vessel of cold water: this makes it more tractable and easily powdered. Afterwards, when examined after cooling, it is found to be mixed with a greyish matter resembling ashes, which they call *eschel.* This grey matter is separated by washing, and then the blue substance is powdered and sifted through fine sieves, to bring it to what we call *powder-blue.* Phil. Transf. N° 396. See Cobalt.

Blue, *turnsol,* is a blue used in painting on wood, made of the seed of that plant. It is prepared by boiling four ounces of turnsol in a pint and a half of water wherein lime has been slacked. See Turnsol.

Blue, *ultramarine.* See Lazulite.

There is a blue substance, something like what Kentman mentions under the name of *cæruleum patavinum.* It was discovered in a peat-moss in Scotland. This earth is at first of a white colour, and only grows blue by being exposed to the air. It has also some resemblance to what Mr. de Costa in his Nat. Hist. of Foss. p. 103. calls *ochria friabilis cærulea.* It is described very minutely by Mr. Douglas, who gives an account of his various experiments upon it, and recommends it as a cheap paint in gum water, particularly as it is levigated and prepared by nature. See Phil. Transf. vol. lviii. N° 27. an. 1768.

Many similar specimens of blue earth have been discovered in England and Ireland, and several parts of the continent.

Blue-*ball,* a name given in some countries to the *Cone-*Wheat.

Blue-*bottle,* in *Botany.* See Centaurea.

Blue-*Cap,* in *Ichthyology.* See Blew-*Cap.*

Blue *John,* the common appellation, among the Derbyshire miners, of Fluor-Spar.

Blue *Mantle Pursuivant of Arms.* This officer is by patent a member of the corporation of heralds. Sir Henry Spelman conjectures, that the title was taken from the colour of the mantle of the French kings. This office is said to have been instituted by Henry V., and probably might be coeval with that of Garter, and erected with reference to that order; but although the catalogues place John Wrexworth and others by this title under the reign of Henry V.; Anthony Wood ascribes the creation of this office to Henry VI., in whose 26th year *Bluemantle Pursuivant* waited on Bruges, Garter king of arms, into France, and also on the bishop of Chichester and others, ambassadors thither. Previous to that date there are not any entries on record relating to this Officer; but from thence to the present time the succession hath been carried on without any interruption.

Blue *Nuns, filles blues,* those of the order of the Annunciation.

BLUEFIELD's Bay, in *Geography,* a bay in the island of Jamaica, lying S.E. of Savannah-la-Mar, and having good anchorage for large vessels. N. lat. 18° 10′ 30″. W. long. 78°.

Bluefield's, or *Blewfield's Bay,* a bay on the western coast of Nicaragua, in New Spain, into which a river of the same name is discharged. N. lat. 11° 40′. W. long. 83°.

BLUEHILL, a township of America, in Hancock county and district of Maine, on the west side of Union river, 344 miles N.E. of Boston, and 13 E. of Penobscot; having 274 inhabitants.

Bluehill *Bay,* a bay of America, formed by Naskeag point on the west, and Mount Desart island on the east, and extending northerly to a mountain on the east of Penobscot river, which, from its appearance at sea, is called "Bluehill." Union river discharges itself into this bay.

Blue *Hills,* a range of mountains in New England, the first ridge of which in New Hampshire passes through Rochester, Barrington, and Nottingham.

Blue *Mountains,* are mountains of America, in Northampton county, and state of Pennsylvania, extending from S.W. to N.E. and through a small interval across the Delaware.—Also, a range of mountains, which run from S.E. to N.W. through Surry county, in the island of Jamaica. Blue mountain peak is said to rise 7431 feet above the level of the sea; and the precipices are interspersed with beautiful savannahs.—Also a mountain in Russia, part of the Altay mountains. See Sinnaia Sopka.

Blue *Ridge,* or *South Mountain,* is the first ridge of the Alleghany mountains in Pennsylvania, Virginia, and North Carolina, distant from 150 to 200 miles from the sea, and, measured from its base, about 4000 feet high. Between this and the north mountain is a large fertile vale. The Passage of the Potowmack river through this ridge is one of the most stupendous scenes in nature. See Alleghany *Mountains,* and Potowmack *River.*

Blue *Lick,* lie on the main branch of the Licking river in Kentucky, and are situated about 8 miles westerly from the Upper Blue Licks. Both of them are on the N.E. side of the river; and the latter is about 15 miles N.E. of Millers.

Blue *Spring,* lies between Big Barren and Little Barren river, southern branches of Green river, in Mercer's county, Kentucky, about 22 miles south-westerly from Sulphur spring, and 13 south of Craig's fort, on the north side of Green river.

Blue *Stone Creek,* a small western branch of the Great Kanhaway.

Blue-*water river,* a river of America, that rises among the southern branches of Duck river, and empties into the Tenessee. It is ascended by boats.

BLUENESS, that quality which denominates a body blue, depending on such a size and texture of the parts that compose the surface of a body, as dispose them to reflect the blue or azure rays of light, and those only, to the eye.

With respect to the blueness of the sky, M. de la Hire, after Leonardo da Vinci, observes, that any black body viewed through a thin white one, gives the sensation of blue; and this he assigns as the reason of the blueness of the sky, the immense depth of which being wholly devoid of light, is viewed through the air illuminated and whitened by the sun. For the same reason, he adds, it is that soot mixed with white makes a blue; for white bodies, being always a little transparent, and mixing themselves with a black behind, give the perception of blue. From the same principle he accounts for the blueness of the veins on the surface of the skin, though the blood they are filled with be a deep red; for red he observes, unless viewed in a clear, strong light, appears a dark brown, bordering on black: being then in a kind of obscurity in the veins, it must have the effect of a black; and this, viewed through the membrane of the vein and the white skin, will produce the perception of blueness.

In

In the same way did many of the early writers account for the phenomenon of a blue sky; such as Fromondus, Funccius, Otto Guericke, and many others: their opinion long prevailed, and has been adopted by some in more modern times, especially by Wolfius and Muschenbrock. But in the explanation of this phenomenon, sir Isaac Newton observes that all the vapours, when they begin to condense and coalesce into natural particles, become first of such a bigness as to reflect the azure rays, before they can constitute clouds of any other colour. This, therefore, being the first colour which they begin to reflect, must be that of the finest and most transparent skies, in which the vapours are not arrived to a grossness sufficient to reflect other colours.

M. Bouguer, without having recourse to the vapours diffused through the atmosphere, in order to account for the reflection of the blue-making rays, ascribes it to the constitution of the air itself, whereby these fainter-coloured rays are incapable of making their way through any considerable tract of it. And he accounts for those blue shadows, which were first observed by M. Buffon in the year 1742, by the aërial colour of the atmosphere, which enlightens these shadows, and in which the blue rays prevail; whilst the red rays are not reflected so soon, but pass on to the remoter regions of the atmosphere. The abbé Mazeas, in a Memoir of the society of Berlin, for the year 1752, accounts for the phenomenon of blue shadows by the diminution of light; having observed that, of two shadows which were cast upon a white wall from an opaque body illuminated by the moon, and by a candle at the same time, that which was enlightened by the candle was reddish, and that which was enlightened by the moon was blue. However, the true cause of this appearance seems to be that assigned by M. Bouguer, which agrees with the solution given of it about the same time by Mr. Melville. But instead of attributing the different colours of the clouds, as sir Isaac Newton does, to the different size of those globules into which the vapours are condensed; Mr. Melville supposes, that the clouds only reflect and transmit the sun's light; and that according to their different altitudes, they may assume all the variety of colours at sun rising and setting, by barely reflecting the sun's incident light, as they receive it through a shorter or longer tract of air: and the change produced in the sun's rays by the quantity of air through which they pass, from white to yellow, from yellow to orange, and lastly to red, may be understood agreeably to this hypothesis, by applying to the atmosphere what sir Isaac Newton says concerning the colour of transparent liquors in general, and that of the infusion of *lignum nephriticum* in particular. Edinb. Ess. vol. ii. p. 75. Bouguer Traité d'Optique, p. 365. Newton's Optics, p. 228; or Priestley's Hist. of Vision, &c. p. 436—449.

BLUFF-HEAD, or *Bluff-headed*, in the *Sea-Language*, is, when a ship has but a small rake forward on, being built with her stem too straight up.

Bluff-headed ships are opposed to those that are sharp-headed. They are shorter, less masted, and sail cheaper.

BLUING or IRON, a method of beautifying that metal sometimes practised; as for mourning buckles, swords, or the like. The manner is thus: take a piece of grind-stone, and whet-stone, and rub hard on the work to take off the black scurf from it; then heat it in the fire, and as it grows hot, the colour changes by degrees, coming first to a light, then to a dark gold colour, and lastly to a blue. Sometimes they grind also indigo and sallad-oil together, and rub the mixture on the work with a woollen rag, while it is heating, leaving it to cool of itself.

Among sculptors we also find mention of bluing a figure of bronze, by which is meant the heating of it, to prepare it for the application of gold leaf, because of the bluish cast it acquires in the operation.

BLUM, JOACHIM CHRISTIAN, in *Biography*, an esteemed German poet, was born at Rathenau, in 1739, and received the early part of his education in his father's house, from a lady, who was the governess of his sisters. At the age of eleven years he lost his father, and became master of a library, of which he availed himself to great advantage. During his residence with his mother and sisters, he amused himself with playing hymns on the harpsichord, and with reading moral authors, and reciting orations, which he did in a manner so affecting as to cause his hearers to shed tears. His mother concluded, that he had an inclination to become a clergyman, and with this view placed him, in 1754, at a school in Brandenburg, where he manifested by his course of reading, and also by his performances, a strong turn for poetry. In 1757, he removed to the gymnasium at Berlin; and giving up all thoughts of the ministerial office, he devoted himself to the study of philosophy and the belles lettres, indulging himself occasionally in his favourite pursuit. From Berlin he proceeded, in 1759, to Frankfort on the Oder, where he studied for some time under Baumgarten, for whom he professed the highest respect; but when this city fell into the hands of the Russians, he retired to the house of his mother; and as his health was in an infirm and declining state, in consequence of an accident which had almost proved fatal to him in his youth, he determined to continue with his mother, and to devote the remainder of his days to the muses in his native place. Here he closed his life, August 28, 1790. His poetical works were "Lyric Poems," and "Idylls," published at various periods after the year 1765. A dramatic piece, in praise of his native town, entitled "Rattenau delivered," was often represented at Berlin with applause, but forbidden in compliance with the request of the Swedish ambassador. Blum's poetry is said to be characterized by softness, simplicity, and correctness, and he ranks among the best poets of Germany. He also published some volumes under the title of "Walks;" two volumes of "Orations;" and a collection of "German Proverbs." His works in general were much read, and approved by persons of the first distinction. The late king of Prussia, Frederick William, honoured him with a very particular token of favour. As Blum's health required his residence in the country, he purchased, in 1787, a small estate, upon which was a mansion in a very ruinous condition; but having in the purchase exhausted almost the whole of his property, he could not repair his house without assistance; and, therefore he addressed a poetical epistle to the king, in which he introduced the following lines:

"O aid thy poet, gracious prince,
And free his breast from care;
All that he asks is competence
His mansion to repair.
Those mould'ring walls, which long have stood
Offensive to the eyes,
A temple then to gratitude,
Shall renovated rise.
His groves, near yonder wand'ring stream,
Whose banks with reeds are crown'd,
Thus consecrated groves shall seem,
And shade the hallow'd ground."

With this address his majesty was so much pleased, that he ordered for him 2000 rix dollars. Blum expressed his gratitude in a second epistle, to which the king returned his best wishes.

wiſhes. Beſides the Greek and Latin, he well underſtood the French, Italian, and Engliſh languages; and he had ſtudied with great attention the hiſtory of the Chriſtian church. Gen. Biog.

BLUMBERG, in *Geography*, a ſmall town of Germany, in the landgravate of Baar.

BLUMENAU, a bailiwick of Germany, in the principality of Calenberg, ſeated on the Leine.

BLUMENFELD, a town of Germany, in the circle of Swabia, and commandery of Minau, ſeated on the river Ach; 8 miles N.N.E. of Schaffhauſen.

BLUMENSTRAST, J. Deodatus, in *Biography*, took his degree of doctor in Medicine in Leyden. Returning thence to Ruſſia, his native country, he was ſoon diſtinguiſhed by the emperor, who made him archiator, or principal phyſician to his court. He had alſo the honour of being appointed the firſt preſident of the Royal Academy of Sciences at Peterſburg, which had been inſtituted, Haller ſays, by his exertions. He died at Moſcow at an advanced age, in April 1755, leaving only one publication, which was firſt printed in the year 1700, 4to. "Medicus Caſtrenſis Exercitui Moſcovitarum." Haller Bib. Med. Pract. Eloy. Dict. Hiſt.

BLUMENTHAL, in *Geography*, a bailiwick of Germany, in the duchy of Bremen.

BLUMLIS Alp, a majeſtic eminence of the Alps, in the canton of Bern, in Swiſſerland, terminating the valley of Lauterbrunnen, and having at its feet a large glacier, which ſtretches towards the valley of Gaſter. The Blumlis Alp, and alſo the feet of the Alpſchelenhorn, are covered with black ſchiſtus; but the granite is not apparent, except at a conſiderable height. The ſides of the Blumlis Alp, bordering the glacier, are black ſlate, in which have been found ſeveral blemnites, and a fragment of a Cornu Ammonis, a foot in diameter.

BLUNDERBUSS, in the *Military Art*, a ſhort ſort of fire arm, with a large bore contrived to carry a number of muſket or piſtol bullets at once. The blunderbuſs is proper to do execution in a crowd, or to make good a narrow paſſage, as the door of a houſe, ſtair caſe, or the like.

BLUNT, in *Fencing*. To fight with blunts, is to exerciſe or parade with weapons without points or edges.

BLUNTING *the angles of a battalion*, in the *Military Art*, ſignifies to retrench the four corners, and turn the ſquare into an octagon. This is done in order to give an opportunity for preſenting the pikes, or firing on all ſides, and was a military evolution formerly much in uſe, but now diſuſed.

BLUSHING, a ſuffuſion or redneſs of the cheeks, excited by a ſenſe of ſhame, on account of conſciouſneſs of ſome failure or imperfection. See Enchymoma.

Bluſhing is ſuppoſed to be produced from a kind of conſent or ſympathy between ſeveral parts of the body, occaſioned by the ſame nerve being extended to them all. Thus the fifth pair of nerves being branched from the brain to the eye, ear, muſcles of the lips, cheeks, palate, tongue, and noſe; a thing ſeen or heard, that is ſhameful, affects the cheeks with bluſhes, driving the blood into the minute veſſels thereof; at the ſame time that it affects the eye and ear. For the ſame reaſon it is, as Dr. Derham obſerves, that a ſavoury thing ſeen or ſmelt, affects the glands and parts of the mouth; if a thing heard be pleaſing, it affects the muſcles of the face with laughter; if melancholy, it exerts itſelf on the glands of the eyes, and occaſions weeping, &c. And to the ſame cauſe Dr. Willis aſcribes the pleaſure of kiſſing.

BLUSTERING *weather* is that where the wind blows with various degrees of ſtrength, attended with a dark ſky, rain, ſnow, &c.

BLUTEAU, Don Raphael, in *Biography*, a religious theatine, was born of French parents in London in 1638. After having diſtinguiſhed himſelf in ſacred and profane literature, he viſited Portugal and acquired ſuch knowledge of the language as to be able to preach in it with applauſe. From Portugal he returned to Paris, and was for ſome time preacher to Henrietta-Maria, queen of England. Upon reviſiting Portugal, he obtained an office in the inquiſition, and became member of the Royal Academy of Hiſtory. Of his works, the moſt eſteemed is "A Portuguefe and Latin Dictionary," in 8 vols. fol. Coimbra 1712—1721, to which he added a Supplement in 2 vols. fol. Liſbon, 1727, 1728. He died at Liſbon in 1734, at the advanced age of 96. Moreri.

BLUTFINK, in *Ornithology*, one of the ſynonymous names of *loxia pyrrhula*, the common bulfinch. Friſch. Av.

BLYSOOG, in *Geography*, a river of South Wales, which runs into the Tivy, about 3 miles S.S.E. of Cardigan.

BLYTH, in *Geography*, a ſmall market town of Nottinghamſhire, in England, has been the ſeat of a caſtle and a priory; but theſe buildings with their endowments and privileges, being entirely demoliſhed at the diſſolution, the town alſo ſunk in the general wreck, and has never ſince been renovated. The whole pariſh conſiſts now only of 157 houſes, with 589 inhabitants. Here are a ſmall market on Wedneſdays, and two annual fairs. The church is a large handſome ſtructure, and contains ſeveral ancient monuments. Some of the Creſſy family built an hoſpital here, which bears the name of Blyth-ſpittle.

Blyth, or *South Blyth*, a ſmall ſea-port town of Northumberland, in England, is a place that has obtained its ſole conſequence ſince the reſtoration; for, previous to that period, here were ſcarcely any houſes. In the year 1728, its trade had ſo much increaſed that above 200 veſſels were entered in the cuſtom houſe books as ſailing from this port. It is conſidered as a creek to the port of Newcaſtle, and its principal trade is in coals. Blyth is 14 miles N.E. of Newcaſtle, and 288 miles N. of London. The townſhip contains 183 houſes, and 1170 inhabitants, of whom 234 are employed in trade. Here is a ſmall market on Saturdays. About three miles ſouth of Blyth is Seaton Delaval, a ſeat belonging to lord Delaval, whoſe grandfather, ſir Francis Blake Delaval, was an able admiral in the beginning of the laſt century. He was often projecting ſome improvements in the ports near his ſeat, and after ſurmounting great difficulties, conſtructed one upon a new plan, which now bears his name.

BMI, in *Muſic*. See Gamut.

BOA, in *Zoology*, a genus of the Serpent race diſtinguiſhed by having plates, or undivided ſcuta, both on the belly and beneath the tail; the latter of which, unlike the crotali, does not terminate in a rattle.

Such is the Linnæan character of this genus, the ſpecies of which are not very numerous. Gmelin enumerates the following kinds in the Syſtema Naturæ; contortrix, canina, hipnale, conſtrictor, cenchris, ophryas, enydris, murina, ſcytale, and hortulana. But in addition to theſe we are to mention a few other ſpecies deſcribed by Dr. Patrick Ruſſel in a recent publication on the ſerpents of India, with the obſervations of Dr. Shaw upon the newly diſcovered kinds, and ſeveral others lately ſpoken of by continental writers.

Dr. Ruſſel in the work above cited, has four new ſpecies of

of boa, called, in the Indian language, *bungarum pamah, padain cootoo, geedi paragoodo*, or in the young ſtate *cobra monil*, and the *boratta pam*. Theſe are the ſpecies, faſciata, viperina, lineata, and boratta of Dr. Shaw's zoology. Dr. Shaw has likewiſe increaſed the number of the boæ by the addition of a fifth ſpecies, *crotalus mutus* of Linnæus, which he is induced to remove from the crotali to this genus, becauſe it is not furniſhed with a genuine rattle like the reſt of that tribe.

But the French writers of the preſent day have regarded the arrangement of the Swediſh naturaliſt in the amphibious claſs of animals with much leſs indulgence, their alterations tending to little leſs than the ſubverſion of his ſyſtem. The boa genus, as eſtabliſhed by Linnæus, is obviouſly defective, in one point at leaſt, where nature had herſelf preſcribed thoſe characters which ought not to have eſcaped the diſcrimination of the naturaliſt. Nothing, we muſt admit, can be more improper, if it could have been avoided, than to include in the ſame natural family both the venomous and inoffenſive kinds of ſerpents; or, in other words, to unite, under one head, thoſe which, having fangs for the conveyance of poiſon into the wound inflicted with their bite, are highly dangerous, and ſuch as have no fangs for this purpoſe, and are therefore comparatively harmleſs. The firſt innovation upon the Linnæan genera was made by Lacepede, whoſe method has been followed by others; and laſtly, by Latreille, with ſome improvements, in his Natural Hiſtory of Reptiles.

Latreille retains among his boæ thoſe only of the Linnæan ſpecies which have no venomous fangs; for the reception of the remainder he eſtabliſhes the new genus SCYTALE. This genus forms an intermediate link between the two Linnæan genera boa, and crotalus; having, in common with both, the abdominal plates, and either plates alone, or plates and ſcales beneath the tail; the poiſonous fangs removing them from the boæ, and the naked tail from the crotali, or ſnakes tl at have a rattle at the extremity of that part. The boæ of Latreille contain the following ſpecies: *le boa devin* (conſtrictor, Linn.), *le boa géant* (a ſpecies hitherto confounded with the former,) *le boa bejobi* (boa canina, Linn. and Lacepede), *le boa hipnale* (hipnale, Linn.), *le boa cenchris* (cenchris, Linn.), *le boa enhydre* (enydris, Linn.), *le boa ophrie* (ophrias, Linn.), *le boa ſcytale* (ſcytale, Gmel. Scheucher), *le boa brodé* (hortulana, Linn.), *le boa rativore* (Seba, v. 2. pl. 29. 1.), and *le boa turc*, a native of the Grecian iſlands, deſcribed by Olivier in his "Voyage dans l'Empire Ottoman."—Thus the Linnæan *boa contortrix*, a poiſonous ſpecies, *le ſcytale a groin* of this writer, is removed from among the boæ to the genus SCYTALE, together with another ſpecies not before deſcribed, *le ſcytale a tête plate*, and the four new ſpecies mentioned by Dr. Ruſſel belong unqueſtionably to the ſame genus, being all of the venomous kind. We have, therefore, ſix ſpecies of the SCYTALES confounded with the natural family of boa.

The boæ, taken collectively, exceed in magnitude all the other tribe of ſerpents. The powers of certain ſpecies, like their ſtature, are prodigious. Theſe enormous kinds are principally the inhabitants of the burning regions of Africa, whoſe fame, in this reſpect, was celebrated in ages of remote antiquity. Hiſtory ſpeaks of theſe tremendous ſerpents in terms that ſtagger credibility; but travellers of our own times, who have had the opportunity of obſerving theſe creatures in their native haunts, and whoſe relations deſerve every rational degree of credit, afford ſo much collateral evidence, that we are not allowed to reject the authority of the ancients in many of the moſt material points. When Valerius Maximus relates, upon the authority of Livy, the conteſt between an army of Romans under Attilius Regulus, and an enormous ſnake, that diſputed with them, for a conſiderable time, the paſſage acroſs the river Bagdara in Africa, and was at laſt only overcome, after killing many of the ſoldiers, by means of the battering machines employed in attacking fortreſſes, we are inclined to ſuſpect the whole as fabulous. If, however, we reflect at the ſame time upon the ſize and power of this monſter, the ſkin of which, when taken off, was 120 feet in length, we need not be aſtoniſhed at the reſiſtance it was capable of making. Something muſt be allowed on this occaſion for the luxuriance of fancy, or the fictions of the battle between the Phœnicians, and the ſacred ſnake of Mars, would almoſt ſhrink from compariſon with this ſurpriſing adventure.

Ille volubilibus ſquamoſos nexibus orbes
Torquet, et immenſos ſaltu ſinuatur in arcus:
Ac media plus parte leves erectus in auras
Deſpicit omne nemus:———————
———————————————
Nec mora: Phœnicas (ſive illi tela parabant,
Sive fugam; ſive ipſe timor prohibebat utrumque)
Occupat; hos morſu, longis complexibus illos;
Hos necat afflatos funeſti tabe veneni. Ovid.

The ſerpent mentioned by Livy is believed to have been an overgrown creature of the boa genus, the *conſtrictor* of Linnæus; a kind which, from the ſuperiority of its ſize, is emphatically denominated the "King of Serpents." This ſpecies, of which we ſhall ſpeak more largely in another place (vide CONSTRICTOR), is found occaſionally in Africa, India, and South America, from 20 to 30 feet in length, and even more; and of a ſtrength ſo great, as to be able to deſtroy moſt of the larger animals by the violence of its preſſure only. We have ſeen the ſkins of this particular ſpecies almoſt 20 feet in length, and of a bulk proportionate. Among the articles of Natural Hiſtory, collected in South America for the National Muſeum at Paris, but intercepted, and ſold in this country, there were ſeveral ſpecimens; dried ſkins of this kind are alſo preſerved in the Britiſh and Leverian muſeums, and in moſt of the public muſeums on the continent, which at once remove every unreaſonable degree of ſuſpicion as to the actual exiſtence of ſuch a monſtrous kind of ſerpent.

If, therefore, according to the ideas of latter writers, the true boæ are deſtitute of poiſonous fangs, nature has more than amply ſupplied the deficiency by the powers they are endowed with for the deſtruction of their prey. The elephant, the rhinoceros, the hippopotamus, and the lion, are the only animals that can reſiſt them with ſucceſs. The ſtag, the leopard, and even the buffalo, entangled once within the coils of the body of the boa, muſt fall an eaſy victim to its voracity. The boæ are, among ſerpents, what the elephant and the lion are among quadrupeds: like the elephant, they ſurpaſs the reſt of the ſerpent race by their ſize; and, like the lion, excel them in their addreſs, their courage, and their force. They ſeldom attack their prey by artifice, decoying their unwary adverſary, and, by a wound as ſudden as inſenſible, paralyzing its efforts with the deadly torpor of their poiſon. Confident in their powers, they attack them openly; oppoſe their ſtrength to the reſiſtance of their enemy with ardent intrepidity; and when they conquer, it is by the manifeſt ſuperiority of bodily vigour over that of their opponent.—It ſhould be obſerved, that theſe traits of character relate only to the largeſt of the boa genus, of which no more than two ſpecies are correctly aſcertained, although there is reaſon to believe the number muſt be greater. Much confuſion prevails among travellers who have deſcribed theſe ſerpents: they have entered largely into the prodigies of their hiſtory, without paying any due regard to the deſcrip-

tion of the animals themselves, a circumstance that has hitherto involved this matter in obscurity, and leaves us in considerable doubt as to the real number of distinct species already discovered, and mentioned by those travellers. See CONSTRICTOR, &c.

BOACRÆ, in *Ancient Geography*, a place of Italy, on the Aurelian way, in the route from Rome to Arelato, through Etruria and the Maritime Alps. Anton. Itin.

BOAD, in *Geography*, a town and fort of Hindoostan, in the country of Orissa, near the Mahanuddy river; 55 miles S. E of Sumpulpour, and 100 west of Cattack. N. lat. 20° 40′. E. long. 84° 10′.

BOADICEA, BOUDICA (Tacitus), or BUNDUICA (as she is called by Dion), in *Ancient British History*, a queen of the Iceni, celebrated for her misfortunes, and for her formidable, though unsuccessful, resistance to the Roman power in Britain.

At the time when the revolt, of which Boadicea was the principal mover, took place, the southern part of the island had tranquilly submitted to the government of the Cæsars. Although scarcely 18 years had elapsed since the invasion of Claudius, Britain was already considered an important acquisition. Several flourishing colonies were founded; numerous settlers flocked from the more distant provinces of the empire, and the only expedition which employed the legions, was that undertaken against the sequestered island of Mona, the principal remaining seat of Druidical superstition. But amidst this seeming security, the oppression exercised by individuals excited indignation among the natives. The procurator, Catus Decianus, who, in the absence of the proprætor, possessed the exclusive administration of government, behaved with the most insufferable tyranny; and, according to the confession of Tacitus himself, the great men of the nation were treated as slaves, and deprived injuriously of their estates by this upstart governor. The fear, however, of incurring the imperial resentment, restrained them from expressing their dissatisfaction otherwise than by murmurs, till the decease of Prasutagus, king of the Iceni, brought matters to a crisis. This monarch, by his attachment to the party of the invaders, had merited the title of friend and ally of the Roman people, and by his last will, had bequeathed his estates as a joint inheritance between the emperor Nero and his two daughters. His policy, if intended as such, failed of the desired effect. The procurator, under pretence of carrying the testament into execution, seized on all the possessions of Prasutagus without exception; and as Boadicea dared to murmur against such flagrant injustice, he actually caused herself to be publicly scourged as a slave, and the chastity of her daughters to be violated by his officers

Such outrages were beyond sufferance. The Iceni to a man rose up in arms, headed by Boadicea in person, who to a masculine spirit joined a gift of natural eloquence calculated to inflame the passions of a barbarous multitude. The Trinobantes, and other neighbouring nations, alike incensed at the extortions of the procurator, followed the example, and an army of 120,000 islanders being rapidly formed, marched directly against Camalodunum, (supposed to have been Maldon,) the nearest Roman colony As Decianus could only spare a few soldiers to assist the inhabitants in its defence, the place was almost instantly stormed, and, with a temple lately erected to the divinity of Claudius Cæsar, reduced to ashes, all within it being previously massacred. The ninth legion, which had ventured to take the field against the insurgents, was next attacked and defeated. The infantry were almost totally destroyed. The commander, Petilius Cerealis, at the head of his cavalry, with difficulty regained his camp, where he carefully intrenched himself; while Catus Decianus, terrified at the consequences of his infamous conduct, made his escape into Gaul, covered with universal odium.

After such a series of ill-fortune, the only hope of the Romans remained vested in the proprætor Suetonius Paulinus, at this time occupied in exterminating the Druids of Mona. On receiving news of the progress made by Boadicea, he immediately marched, though by a dangerous route, and through the midst of an hostile country, to Augusta (London), already a considerable place, though not yet dignified with the name of a colony. As he judged this post untenable, he retired to unite his scattered forces, accompanied by such of the inhabitants as chose to follow his fortunes; but the women and children, the old and infirm, who were left behind, without any other protection than their sex, their age, or their situation afforded, were indiscriminately sacrificed to the fury of the Britons. Verulamium, another colony, shared the same fate. All foreigners were every where put to the sword, and the cruelties, said by Dion to have been exercised upon some of the sufferers, are shocking beyond description.

The rebellion had now attained its utmost height. Three Roman stations laid in ashes, and the blood profusely poured of 70,000 of her persecutors, had amply revenged the wrongs of Boadicea. The whole eastern part of the island was in possession of her partizans, and her forces in arms had increased to the amazing number of 230,000, when Suetonius, having taken every measure prudence could suggest in his circumstances, prepared to check this torrent in its course. The proprætor, although accused, and perhaps with justice, of pride and excessive cruelty, yet possessed the most splendid military talents. During the last reign he had signalised himself, when commander in Africa, by a complete victory over the rebellious Mauritanians. Nero rewarded his bravery by naming him to the government of Britain. The late reduction of Mona had increased his celebrity; and he appears to have been the only general then in the empire, Corbulo probably excepted, equal to the task of reducing the insurrection raised by Boadicea. His situation was, however, extremely critical. It was in vain that he dispatched instructions to Pænius Posthumus, who commanded the second legion, to march to his assistance. Pænius, in consequence of some difference with his general, or actuated by a secret jealousy, refused to move, in direct disobedience to orders. Thus Suetonius saw his whole force reduced to the fourteenth legion, Gemina, and the Vexillarii of the twentieth, which, added to a few auxiliary cohorts, only amounted to about 10,000 men. With this army, small as it was, he determined on hazarding a battle, and therefore waited the approach of the Britons on a narrow spot of ground, opening in his front into an extensive plain, while his rear was protected by a thick wood. According to the usual disposition observed by the Roman armies, the legionaries were stationed in the centre, flanked by the light armed and auxiliary cohorts; the wings being composed of cavalry. Suetonius did not tarry long in expectation of the enemy. The Britons soon appeared, covering the plain in immense numbers. Their wives and children, who had accompanied them to become spectators of a victory already considered as certain, were mounted in heaps on waggons, encircling the field in their rear, like an amphitheatre. Boadicea, with her two daughters, drove in a chariot along the ranks, encouraging her troops in animated language. She renewed the detail of Roman injustice; besought vengeance for the wrongs sustained by herself and her family; magnified the importance of the victory she had already gained, and assured her followers

lowers that their enemies, forſaken by all the gods, would never be able to endure even their ſhouts of onſet. She finiſhed by exhorting them to conquer or die, which, ſhe added, was her own reſolution. Suetonius on his ſide did not neglect to animate his men by a ſuitable oration, and the acclamation and cheerful countenance with which it was received, convinced him that he had every thing to hope from the bravery and diſcipline of his ſoldiers.

The Britons came on, uttering loud ſhouts, menaces, and ſongs of victory, while the Romans, cloſely drawn up, awaited the onſet in perfect ſilence, and at the requiſite diſtance, made a firſt diſcharge of the pilum with terrible effect. Preſerving the advantage of the ground, they received the attack of the barbarians with ſuch firmneſs, as checked its impetuoſity; till, having expended all their javelins, not without dreadful carnage of the enemy, they ruſhed forward from all parts at once, obſerving the form of a wedge, the more eaſily to penetrate ſuch an immenſe multitude. This charge was ſeconded by the allies with equal ardour. The firſt ranks of their oppoſers were inſtantly borne down, and hewn in pieces; but the reſt crowding to ſurround the Romans, a bloody conteſt commenced. The Britiſh war-chariots, wherever they ſucceeded in breaking in among their enemies, occaſioned terrible annoyance, till Suetonius, ordering his men to direct their blows at the naked bodies of the drivers, by degrees diſembarraſſed himſelf of theſe troubleſome invaders. The action was long maintained with fury on both ſides, the Britons, though deſtitute of order or diſcipline, fighting with great obſtinacy and deſperation; but, finally, the ſuperior ſkill, coolneſs, and bravery of the Romans, bore down every oppoſition. Prodigious numbers periſhed beneath the ſwords of the legions, or by the charges of the cavalry, who trampled all before them: while the crowds that endeavoured to ſave themſelves by flight, met with an inſurmountable impediment in their own waggons, which encloſed them in form of a ſemicircle. Here the ſlaughter was terrible, for mercy in the circumſtances of Suetonius, would have been in the higheſt degree imprudent. The Romans, in the heat of their fury, ſpared neither age nor ſex. Even the beaſts of burden, ſtruck through with darts, increaſed the horrors of the ſcene, and the heaps of dead, which covered the plain, the fields, and the ſurrounding foreſts. Upwards of 80,000 Britons are computed to have periſhed on this occaſion; while of the Romans about 400 were killed, and ſcarcely ſo many wounded.

Few victories, even in the moſt flouriſhing ages of the republic, deſerved to be compared with this of Suetonius. Never had any been more deciſive. The remaining rebels, terrified at the dreadful chaſtiſement they had received, diſperſed into their reſpective diſtricts, and Boadicea herſelf periſhed ſoon after the battle, either through chagrin, or, as is the prevailing opinion, ſhe ended her days by poiſon. Poenius Poſthumus, whoſe diſobedience had prevented the ſecond legion from ſharing in the triumph of their countrymen, fell upon his own ſword, thus avoiding the puniſhment and diſgrace which awaited his conduct. The vigour with which, though accompanied by acts of the moſt terrible ſeverity, Suetonius purſued the revolters, reſtored tranquillity to the whole iſland before the enſuing ſpring. The intrigues of individuals, and the jealouſy of his execrable ſovereign, occaſioned his ſubſequent recal from his government; yet the triumphs obtained under his auſpices, conferred everlaſting honour and renown both on his own name and that of the legion he commanded.

Boadicea is deſcribed by Dion Caſſius as a woman of large ſtature, ſtrong and well proportioned in her limbs, of a manly and ſtern countenance, harſh, authoritative voice, and poſſeſſing beautiful golden hair, which reached down below her waiſt. That ſhe was poſſeſſed of uncommon abilities, or at leaſt had perſons of extraordinary talents to aſſiſt her, is evident from the rapidity with which ſhe cut off the Roman garriſons one after another; the diſpoſition of her forces, ſo as entirely to interrupt the communication between the quarters of the legions; the victory ſhe obtained over Cerealis, famous himſelf for his military knowledge, and the extremities to which ſhe reduced Suetonius, the greateſt general of the age. Dion is loud in praiſe of her eloquence, and puts into her mouth ſeveral elaborate orations. We have preferred the authority of Tacitus, reſerving, however, ſuch paſſages of Dion as are moſt neceſſary to elucidate the narration. The defeat and death of Boadicea are ſaid to have happened A. D 61. Tacit. Annal. xiv. c. 31—37. Dion Caſſius, Hiſt. Rom. l. lxii. cap. 1—12.

BOADJOOS, in *Geography*, called alſo *Oran laut*, or men of the ſea, are a ſort of itinerant fiſhermen in the Eaſt Indies, ſaid to come originally from Johore, at the eaſt entrance of the ſtraits of Malacca, though ſome are of opinion, that they muſt have come either from China or Japan. They live chiefly in ſmall covered boats, on the coaſts of Borneo, Celebes, and the adjacent iſlands. Others dwell near the ſea, on theſe iſlands; their houſes being raiſed on poſts, at a little diſtance in the ſea, and always at the mouths of rivers. They are Mahometans; and have a language of their own, but no written character. Many Boadjoos are ſettled on the north-weſt coaſt of Borneo, who not only fiſh, but make ſalt, and trade in ſmall boats along the coaſt. Some of their boats are from 12 to 18 and 20 tons burden, and carry from 15 to 20 men, and form, in ſome places, a fleet of a hundred ſail. Others of them are about 5 or 6 tons burden, which are managed by women, even in heavy ſeas. Their method of making ſalt is as follows; they gather ſea-weeds, burn them, make a ley of aſhes, filter it, and form a bitter kind of ſalt in ſquare pieces, by boiling it in pans made of the bark of the anccbon, or cabbage-tree; theſe pieces of ſalt are carried to market, and paſs as a currency for money. Thoſe that are ſettled on the north-weſt coaſt of Borneo uſed to ſupply the Engliſh at Balambangan with rice, fowl, and other proviſions. Many of them are ſettled at the mouth of the river of Paſſir, who employ themſelves chiefly in catching ſmall ſhrimps with hand-nets, which they puſh through the mud; the ſhrimps, after being well waſhed with water, are expoſed to a hot ſun. They are then beat in a mortar, and made into a kind of paſte, called *blatchong*, which has a ſtrong ſmell, and is much in requeſt all over India. Theſe laſt Boadjoos may be conſidered as ſtationary or fixed, compared with thoſe who live always in their boats, and who, as the monſoon ſhifts on the iſlands Borneo and Celebes, ſhift their ſituation to leeward, ſo as to be always under the lee of the land, for the ſake of fine weather. Moſt of thoſe who rove round Celebes, though they change their ſituation with the monſoon, conſider Macaſſer as their home. Whilſt the Boadjoos lie at anchor, in boats managed by their women, they are dexterous in fiſhing for *trip ngs*, i. e. ſwallows, or ſea-ſlugs, which they take in ſeven or eight fathoms water. When they ſee the ſwallow in clear water, they ſtrike it with an inſtrument, conſiſting of four-bearded iron prongs, fixed along an almoſt cylindrical ſtone, rather ſmaller at one end than at the other, about 18 inches long; an iron ſhot is fixed at the end of the ſtone, next the point of the prongs. The ſwallow is dried in the ſmoke, and ſent to the China market. They alſo dive for it, the beſt being found in deep water. The black is reputed the beſt; but there is ſome of a lighter colour, found only in deep water, which is more valued

valued in China than the black, and sold even for 40 dollars a picol: some of the pieces weigh half a pound. The white, caught in shoal water and on the dry sand, among coral rocks, is the worst; its value being about four or five dollars a picol. The Boadjoos are very useful to the Dutch East India company, in carrying intelligence speedily from place to place. Stavorinus's Voyages, vol. ii. p. 240.

BOADODA *Bashaw*, in the *Turkish Military Orders*, an officer of the *janizaries*, whose business it is to walk every day about the principal parts of the city, with a number of janizaries to attend him, to keep order and see that all things are regular, even to the dress. This office is for three months, and from this the person is usually advanced to be a *serach*.

BOÆ, in *Ancient Geography*, a town of Peloponnesus in Laconia, at the extremity of the Bœotian gulf. Diana was particularly worshipped in this place; Apollo and Esculapius had their respective chapels here. At some stadia from this city was a temple of Serapis and Isis. Pausanias.

BOAGRIUS, a river, or rather torrent, of Greece, in the country of the Epicnemidian Locrians, according to Ptolemy. Strabo says, that it watered the town of Thronium.—Also, a town of the same country, situate to the west, on the confines of Phocis.

BOANERGES, i. e. *Sons of Thunder*, in *Scripture History*, a name given by our Lord to the two apostles James and John (Mark, iii. 17.) which some have erroneously supposed to be an appellation of reproach, intimating a fierceness and furiousness of temper; whereas it is much more reasonable to consider it, with others, as a title of honour, prophetically representing the resolution and courage with which they would openly and boldly declare the great truths of the gospel, when they were made fully acquainted with them. How well they deserved this title, sufficiently appears in the sequel of their history. See JAMES, and JOHN.

BOANS, in *Zoology*, a species of RANA, or frog, the body of which is smooth, marked with contiguous spots beneath; and the feet palmated. Gmelin. Two varieties of this kind are described; β, having the upper part of the body blueish lead colour, and γ, with the body inclining to orange. Laurent. Amph. &c.

This kind inhabits America, and differs from *rana arborea*, the tree-frog, to which it is nearly allied, according to Gmelin, in having all the feet webbed, and the body spotted with white. Much confusion prevails respecting the Linnæan species, boans. Dr. Shaw suspects it to be the same as the *rana maxima* of that author, probably in a younger state. He mentions likewise another supposed variety, the *rana virginiana altera* of Seba.

BOAR, the *wild boar* or hog from whence the common hog derives its origin See SCROFA SUS. The male of the tame hog is also called the boar.

The wild boar is a native of almost all the temperate parts of Europe and Asia, and is also found in the upper parts of Africa. Formerly it was an inhabitant of this country, as appears from the laws of Howel Dda, who permitted his grand huntsman to chase that animal from the middle of November to the beginning of December. (Leges Wallicæ, 41.) There are also many places in Wales that retain the name Peinarth, or the Boar's Head, to this day. William the Conqueror punished with the loss of their eyes any that were convicted of killing the wild boar, the stag, or the roebuck. (Leges Saxon. 292.) And Fitz-Stephen tells us, that the vast forest, which in his time grew on the north side of London, was the retreat of stags, fallow deer, wild boars, and bulls. Charles I. turned out wild boars in the New Forest, Hampshire; but these were destroyed in the civil wars. (Pennant.) In France, Germany, Poland, and other countries on the European continent, they are still common, and the hunting of them is a principal amusement among parties of the gentry. Boar-hunting is a favourite diversion also in other more distant parts of the world.

These animals are found in the steppes of the Samara and the Volga, in Russia, on the confines of the river Ural in Daouria, and about the Irtysh. Between the Ural and the Yamba they are very numerous, and are hunted in winter by the Cossacks, not without danger, with dogs, and sometimes killed with carabines, and sometimes with lances. Although they feed solely on the roots of sea-weed and sedge, they grow to such an extraordinary size, that they are frequently found weighing upwards of six hundred pounds; their bacon is nearly four inches thick in fat, though their flesh is in general dry and firm and well-flavoured.

Sonnini thinks it probable (see his Travels in Upper and Lower Egypt, p. 348.) that the wild boars of Egypt are not the same with those in Europe. The great difference of climate, and the still greater difference of situation, must have occasioned at least some varieties in the species of these animals. More multiplied in temperate or cold countries, which appear more suitable to their nature, they inhabit the thick recesses of the forests, where they can find abundance of food. They never leave the woods but to pass from one to another, or to ravage the growing crops, and these predatory excursions are undertaken only by night. In general, they retire to the darkest and closest places at the rising of the sun, the brightness and heat of which they seem to dread. The wild boar of Egypt, on the contrary, has no shelter. Continually exposed to the rays of a burning sun, he roams over the hottest sands, where he with difficulty finds a few scattered shrubs, which afford him a scanty subsistence, and scarcely any shade. He is also frequently seen in the deserts of Nitria, which is the resort of a greater number of animals than any other part of the deserts, on account of the sheets of water it contains, and of the plants that grow on their banks. These boars are solitary, though a general want of food sometimes drives them in herds to the environs of the lakes of Natron. As the Mahometans and Copts do not eat the flesh of the wild boar more than that of the hog, and hold both these animals in equal abhorrence, it was impossible, says this writer, to procure a wild boar in Egypt, at least without seeking it in the desert. Upon the whole he concludes, that they are not the same as those of Europe. It is perhaps, he adds, in this sense only that we must understand the passages of Aristotle (Hist. Nat. l. viii. c. 24.), and Pliny (Hist. Nat. l. viii. c. 33.), who have asserted that there are no wild boars in Africa. Wild boars, says Buffon, are as common in Asia and Africa as in Europe. But he has given an account and a drawing of an African wild boar, which is remarkable for several particular characters; and hence there is reason to believe, that the "hanzire" of Egypt is the same animal as the wild boar of Africa.

Among huntsmen, the wild boar has several names according to its different ages: the first year it is called a pig of the saunder; the second, a hog; the third, a hog-steer; and the fourth, a boar. When leaving the saunder, he is called a singler, or sangler. The wild boar inhabits woods, living on roots, masts, acorns, and other vegetable food. Though gluttons, they do not attack other animals to devour them; but they eat flesh when they meet with it. They have been seen to eat horse-flesh; and the skin of the deer,

deer, and the claws of birds have been found ſticking in their ſtomach, but this may be from neceſſity. Yet they are fond of blood, ſince they will eat their own young, or even children in the cradle, according to Buffon. Wild boars (ſays this writer) do not ſeparate from their mothers until the third year, and till that age are called by the hunters ſtock beaſts, or beaſts of company. They never wander alone till they have acquired ſufficient ſtrength to reſiſt the attacks of the wolf. Theſe animals when they have young, form a kind of flocks, and it is upon this alone their ſafety depends. When attacked, the largeſt and ſtrongeſt front the enemy, and by preſſing all round againſt the weaker, force them into the centre. Domeſtic hogs are alſo obſerved to defend themſelves in a ſimilar manner. The wild boar is hunted with dogs, or killed by ſurpriſe during the night when the moon ſhines. As he flies ſlowly, leaves a ſtrong odour behind him, and defends himſelf againſt the dogs, and often wounds them dangerouſly, fine hunting dogs are unneceſſary, and would have their noſe ſpoiled, and acquire a habit of moving ſlowly by hunting him Maſtiffs, with very little training, are ſufficient. The oldeſt boars, which are known by the track of their feet, ſhould alone be hunted: a young boar of three years is difficult to be attacked, becauſe he runs very far without ſtopping; but the old boars do not run far, allow the dogs to come near, and often ſtop to repel them. During the day, the boar commonly keeps in his ſoil, which is the moſt ſequeſtered part of the woods, and comes out by night in queſt of food; and in ſummer, when the grain is ripe, it is eaſy to ſurpriſe him among the cultivated fields, which he frequents every night.

The boar lives to twenty-five or thirty years, if he eſcapes accidents. The time of going to rut is in December, and laſts about three weeks. They feed on all ſorts of fruits, and on the roots of many plants; the root of fern, in particular, ſeems a great favourite with them; and when they frequent places near the ſea-coaſt, they will deſcend to the ſhores, and demoliſh ſhell-fiſh. Their general places of reſt are among the thickeſt buſhes that can be found, and they are not eaſily put out of them, but will ſtand the bay a long time. In April and May they ſleep more ſoundly than at any other time of the year, and this is therefore the ſucceſsful time for taking them in the toils. When a boar is rouſed out of the thicket, he always goes from it, if poſſible, the ſame way by which he came to it; and when he is once up, he will never ſtop till he comes to ſome place of greater ſecurity. If it happens that a *ſaunder* of them are found together, when any one breaks away, the reſt will follow the ſame way. When the boar is hunted in the wood where he was bred, he will ſcarce ever be brought to quit it; he will ſometimes make towards the ſides, to liſten to the noiſe of the dogs, but retires into the middle again, and uſually dies or eſcapes there. When it happens that a boar runs a-head, he will not be ſtopped or put out of his way by man or beaſt, ſo long as he has ſtrength left. He makes no doubles or croſſings, when chaſed; and when killed, makes no noiſe, if an old boar; but the ſows and pigs will ſqueak when wounded.

The ſeaſon for hunting the boar begins in September, and ends in December when they go to rut. If it be a large boar, and one that has lain long at reſt, he muſt be hunted with a great number of dogs, and thoſe ſuch as will keep close to him; and the huntſman, with his ſpear, ſhould always be riding in among them and charging the boar as often as he can to diſcourage him. Such a boar as this, with five or ſix couple of dogs, will run to the firſt convenient place of ſhelter, and there ſtand at bay, and make at them as they attempt to come up with him. There ought always to be relays alſo ſet for the beſt and ſtaunchest hounds in the kennel; for if they are young eager dogs, they will be apt to ſeize him, and be killed or ſpoiled, before the reſt come up. The putting of collars with bells about the dogs' neck is a great ſecurity for them; for the boar will not ſo ſoon ſtrike at them when they have theſe, but will rather run before them. The huntſmen generally kill the boar with their ſwords or ſpears; but great caution is neceſſary in making the blows, for he is very apt to catch them upon his ſnout, or tuſk, and, if wounded and not killed, he will attack the huntſman in the moſt furious manner. The places in which the wound is to be given with the ſpear, are either between the eyes in the middle of the forehead, or in the ſhoulders; both theſe places make the wound mortal. When this creature makes at the hunter, his ſafety conſiſts merely in courage and addreſs; if he [illegible] for it, he is ſurely overtaken and killed; if the boar comes ſtraight up he is to be received at the point of the ſpear; but if he makes doubles and windings, he is to be watched very cautiouſly, for he will attempt getting hold of the ſpear in his mouth, and if he does ſo, nothing can ſave the huntſman but another perſon's attacking him behind. He will, on this, attack the ſecond perſon, and the firſt muſt then attack him again. Two people will thus have enough to do with him; and were it not for the forks of the boar-ſpears that make it impoſſible to preſs forward upon them, the huntſman, who gives the creature his death's wound, would ſeldom eſcape falling a ſacrifice to his revenge for it.

The modern way of boar-hunting is generally to diſpatch the creature by all the huntſmen ſtriking him at once; but the ancient Roman way was for a perſon on foot, armed with a ſpear to keep the creature at bay; and in this caſe the boar would run of himſelf upon the ſpear to come at the huntſman, and puſh forward till the ſpear pierced him through.

The hinder claws of a boar are called *guards*. In the corn he is ſaid to *feed*; in the meadows or fallow-fields, to *root*, *worm*, or *fern*; and in a cloſe to *graze*. The boar is farrowed with as many teeth as he will ever have; his teeth increaſing only in bigneſs, not in number. Among theſe there are four called tuſhes, or tuſks, the two biggeſt of which are of no uſe to him when he ſtrikes, ſerving only to whet the two loweſt, which are his moſt formidable weapons of defence. As the boar advances in age, he becomes leſs dangerous, on account of the growth of thoſe tuſks, which turn up or take ſuch a curvature, as rather to impede than aſſiſt him in wounding his adverſary. The Ethiopian boar, or hog, is a ſtill more fierce and dangerous animal than the kind found in Europe. In habits and manners they are pretty much the ſame, although ſpecifically different; and, like the common boar, is capable of inflicting the moſt tremendous wounds with its tuſks.

The fleſh of the boar was eſteemed a delicacy among the ancient Romans; a boar ſerved up whole was a diſh of ſtate. The boar was ſometimes alſo the military enſign borne by the Roman armies in lieu of the eagle. Certain writers of modern date ſpeak of the fleſh being unwholeſome, except to thoſe with athletic conſtitutions.

A remarkable circumſtance concerning the wild boar is related by Sonnini. In the year 1787, an animal of this kind, of a moſt extraordinary ſize, was killed in the neighbourhood of Cognac, in Angoumois, which had many times eſcaped from the hunters, had received many gun-ſhot wounds, and had coſt the lives of ſeveral dogs and men each time of attacking him. When this animal was at length ſlain, ſeveral bullets are ſaid to have been found be-

tween his ſkin and fleſh. Had not the above account been given by hunters of diſtinguiſhed order, and too well acquainted with theſe animals to have made any miſtake, it might have been imagined, that this formidable creature, which had long continued its ravages in the park of Cognac, belonged to a different ſpecies. It was of an enormous ſize, with a very long head, a very ſharp or pointed ſnout, and its mouth was armed with teeth of a very ſingular form. The hairs of the body were white; thoſe of the head yellowiſh; the neck marked with a black band in form of a cravat; and the ears large and ſtraight; and what appears ſurpriſing, conſidering its ſize, it was of uncommon ſwiftneſs. For a further hiſtory of this animal, ſee SCROFA.

BOAR, in the *Manege*. A horſe is ſaid to *boar* when he ſhoots out his noſe as high as his ears, and toſſes in the wind.

BOARD, a piece of timber ſawed thin, for the purpoſes of building. See TIMBER.

We ſay, a deal-board, an oak-board, &c. Boards thicker than ordinary are called *planks*. Boards formed ready for the coopers' uſe are called *clap-boards*. We have alſo mill-board, and ſcale-board, ſhaved very thin, for caſes, band-boxes, &c. Deal-boards are generally imported into England ready ſawed, becauſe they are prepared cheaper abroad, by means of ſaw mills. Clap-boards are imported from Sweden and Dantzick. Oak-boards chiefly from Sweden and Holland; ſome from Dantzick. Pipe-boards are brought from Dantzick. We alſo import white boards for ſhoe-makers; mill and ſcale-boards, paſte-boards, &c. for divers artificers. Scale-board is a thinner ſort, uſed for the covers of primers, thin boxes, and the like. It is ſawed with mills, and imported from Hamburgh.

BOARD, *feather-edged*, *graining*, *log*, *paſt*, *ſound*, *trail*, *waſte*, *weather*. See the ſeveral adjectives.

BOARD, is alſo uſed for a kind of table or bench, whereon ſeveral artificers perform their work.

In this ſenſe, we ſay a work-board, a ſhop-board, a taylor's-board, &c.

BOARD, is alſo uſed for a flat machine, or frame, uſed in certain games, and the like.

In this ſenſe, we ſay a draught-board, a chefs-board, a ſhovel-board, and the like.

BOARDS, in *Book-binding*. See BOOK-BINDING.

BOARD, *bureau*, is alſo uſed for an office where accounts are taken, payments ordered, and the like.

In this ſenſe, we ſay the board of works, board of ordnance, board of treaſury, and the like.

BOARD *of green cloth*. See GREEN-CLOTH.

BOARD *of Controul*, was firſt inſtituted in 1784, by ſtat. 24 Geo. III. ſeſſ. 2. c. 25. with a view of directing and aiding the Eaſt India company, in the executive government of India, and eſtabliſhing a power of controul in this kingdom. This board was further eſtabliſhed and regulated by the ſtat. 33 Geo. III. c. 52. the operation of which commenced in India on the 1ſt of February 1794. By the former act ſix perſons were to be nominated by the king, as commiſſioners for the affairs of India; but by the latter, the number, inſtead of being limited to ſix privy-counſellors, is indefinite, depending upon the king's pleaſure; of which number the two principal ſecretaries of ſtate, and the chancellor of the exchequer are to be three; and his majeſty, if he pleaſes, may add to the liſt two commiſſioners, not of the privy-council; and the perſon firſt named in the king's commiſſion is to be preſident. The king may give 5000l. a year among ſuch of the commiſſioners as he pleaſes; which, together with the ſalary of the ſecretary and officers, and other expences of the board, are to be paid by the India company; the whole not to exceed 16,000l. per annum. The members of this board and their officers are ſworn to execute the ſeveral powers and truſts repoſed in them, without favour or affection, prejudice or malice. The office of a commiſſioner, or chief ſecretary, is not to be deemed a new office, to diſable them from ſitting in parliament; nor is the appointment of a commiſſioner, not having a ſalary, or of a chief ſecretary, to vacate a ſeat. Three commiſſioners muſt be preſent to form a board. The powers of the board are to ſuperintend, direct, and control all acts, operations, and concerns, which relate to the civil and military government and revenues of the Britiſh territorial poſſeſſions in India, ſubject to certain reſtrictions. They and their officers are to have acceſs to the papers and records of the company, and to be furniſhed with copies or extracts of ſuch of them as ſhall be required. They are alſo to be furniſhed with copies of all proceedings of general courts, and courts of directors, within eight days, and with copies of all diſpatches from abroad, relating to matters of government or revenue, immediately after their arrival. No orders on thoſe ſubjects are to be ſent by the company to India, until approved by the board; and when the commiſſioners vary or expunge any part of the diſpatches propoſed by the directors, they are to give their reaſons; and all diſpatches are to be returned to the court of directors in 14 days. The directors may ſtate their objections to any alterations, and the commiſſioners are to re-conſider them; and if they interfere with what the directors deem matter of commerce, the directors may apply to the king in council to determine betwixt them. But the board is reſtricted from the appointment of any of the company's ſervants. If the directors, on being called upon to propoſe diſpatches on any ſubject relating to government or revenue, ſhall fail to do ſo within 14 days, the board may originate their own diſpatches on that ſubject. The board is not to authorize any increaſe of ſalaries, or any allowance or gratuity to be granted to perſons employed in the company's ſervice, except the ſame ſhall be firſt propoſed by the company; and their intention and reaſons for ſuch grant are to be certified to both houſes of parliament, 30 days before the ſalary can commence. The directors are to appoint three of their members to be a committee of ſecrecy, through whom diſpatches, relating to government, war, peace, or treaties, may be ſent to or received from India This committee, and their clerks, are to be ſworn to ſecrecy. Orders of directors, concerning the government or revenues of India, once approved by the board, are not ſubject to revocation by the general court of proprietors. For the further proviſions of the acts, appointing the board of controul, ſee *Eaſt India* COMPANY.

BOARD *of Ordnance*. See ORDNANCE.

BOARD *of trade and plantation*, was eſtabliſhed by king William, in the year 1696. Commercial matters had before this time been generally referred to a fluctuating committee of the privy-council; the obvious inconveniences attending this mode of management, induced king Charles II. to erect a ſpecial council of trade in the year 1668, which was ſoon after laid aſide; it was renewed again in 1672, but ſoon diſcontinued, and the former method of reference to committees of the privy-council revived. In 1696, a regular and permanent board was eſtabliſhed, for ſettling all diſputes and regulations relating to commerce and colonies. This board, beſide ſuch of our miniſters of ſtate, who only attended on extraordinary occaſions, conſiſted of a firſt lord commiſſioner, and of ſeven other commiſſioners, with an annual ſalary of one thouſand pounds each. This board was aboliſhed in 1780.

BOARD *of trade, bureau de commerce*, an office in the French polity,

polity, eſtabliſhed in 1723, compoſed of eight perſons of experience in commerce and navigation, where all papers and propoſals relating to the improvement of trade are examined, and all difficulties which occur in affairs of navigation and commerce, either within or without the realm, are diſcuſſed.

Board-*wages*, denote a certain annual ſum allowed to houſhold ſervants for maintenance. Board-wages, granted to the menial officers and ſervants of the crown, commenced in 1629, when the neceſſities of king Charles obliged him to retrench the expence of his houſhold, by abolithing the greateſt part of the daily tables in his palace, which were eighty in number, and ſubſtituting this annual allowance in their room.

Board, or Aboard, in the *Sea Language*, is uſed in ſpeaking of things within a ſhip or other veſſel.

Hence, to go *aboard* ſignifies to go into the ſhip; to heave *over-board*, is to throw a thing out of the veſſel into the ſea; to ſlip by the *board*, is to ſlip down by the ſhip's ſide; to fall *a-board* of, is to ſtrike or encounter another ſhip, when one or both are in motion; to keep the land *a-board*, or to keep hold of the land, is to ſteer near to, or in ſight of the land; *board* and *board*, is when two ſhips come ſo near as to touch one another, or when they lie ſide by ſide. *Weather-board*, is that ſide of a ſhip which is to windward. To *board a ſhip*, is to enter an enemy's ſhip in an engagement. See Boarding, *infra*.

Board denotes the diſtance run by a ſhip at one tack; and hence to *make a board*, or as it is otherwiſe expreſſed, to *board it up* to a place, is to turn to windward; and to beat ſometimes upon one tack, and ſometimes upon another; in which it is to be noted, that the farther you ſtand off to one point of the compaſs, the better board you will make; and that it is better making *long boards* than ſhort ones, if you have ſea-room. A *long board* is when you ſtand a great way off before you tack or turn; a *ſhort board* is when you ſtand off a little; a *good board* is when a ſhip does not go to leeward of her courſe, or advances much at one tack, and ſails upon a ſtraight line. To leave a land on *back-board*, is to leave it a-ſtern, or behind; the *back-board*, being that which in boats or ſhips, we lean our backs againſt. *A-board* main-tack, the order to draw the main-tack; i.e. the lower corner of the main-ſail, down to the cheſs-tree. See Chess-*tree*.

Board, *Lar*, and *Starboard*. See Larboard and Starboard.

BOARDED *Floor*. See Floor.

BOARDING, in *Naval Tactics*, denotes the art of approaching the ſhip of an enemy ſo near as to admit of the graplings which are fixed on the lower yard-arms, at the forecaſtle, gang-ways, &c. being thrown into it, for the purpoſe of ſecuring the veſſels together, and of entering her decks, with a detachment of armed men. The method of conducting or of avoiding this kind of attack depends upon the relative ſituation of the contending ſhips; and varies, as it is to be performed to windward, to leeward, with the wind at large, or when the ſhip propoſed to be boarded is at anchor.

In the firſt caſe, when the enemy's ſhip keeps her wind under an eaſy ſail, and is overtaken in a chaſe by thoſe who intend to board her, the veſſel of the latter muſt get on the weather-quarter of the former, within half a piſtol ſhot. She ſhould then begin and continue a briſk action, ſo that the ſmoke of the cannon and muſquetry of both ſhips may conceal her manœuvres; and, under the cover of this cloud, ſhe ſhould increaſe her ſail, if ſhe has not way enough, in order to augment her velocity and the rapidity of her movements, that ſhe may more readily lay on board the enemy, on the weather-ſide, either exactly abreaſt or a little abaft. This may be eaſily done, be edging down ſuddenly upon her, but avoiding being raked by the enemy's fire. By this manœuvre the grapnels will be on board of the adverſe ſhip, before or very ſoon after ſhe ſuſpects the deſign of the boarders. In this ſituation, the veſſel propoſed to be boarded can recur only to one precarious expedient, which, duly obſerved by the boarder, will be of little or no avail. For when ſhe braces ſharp a-back her head ſails, to cauſe the ſhip's falling off, and ſquares thoſe aft, to give her ſtern-way, the boarder, by performing briſkly the ſame manœuvre, will be as well ſituated for boarding as before; provided the boarding ſhip feels the impulſe of her ſails and helm, which ought to be put a-weather, and kept ſo till the ſhip's head-way ceaſes, when it is to be put a-lee, to aſſiſt her in falling off, in order to board the enemy to lee-ward; for the boarder ought to be on the quarter of the other, ſince at the moment the two ſhips were right before the wind, ſhe who was directly to windward and wiſhed to board, had only to continue her movement of rotation, and render her velocity equal to that of her adverſary, by ſhortening ſail in order not to paſs her. If, therefore, the circular motion is kept up by the boarder, which at firſt cauſed him to fall off, and now brings him to the wind on the other tack, he will join the enemy to lee-ward; for it is evident that, if this motion of turning be more rapid than that of the ſhip which wiſhes to avoid boarding, the boarder will cloſe with her before ſhe can range to the wind on the other tack, ſince the boarder comes round with greater celerity. However, if the ſhip which fears boarding was preſſed thus cloſely, ſhe could make no other attempt than to throw once more all her ſails to the maſt, by bracing them only perpendicular to the keel to give her ſtern-way, and putting the helm a-weather, to keep her to the wind, as ſoon as her head-way ceaſes; obſerving that, as ſhe is to windward, ſhe may be thus driven on the boarder, who watches for her under her lee. But neceſſity obliges her to adopt this only expedient; becauſe, if ſhe could go a-ſtern with ſufficient velocity, ſhe might let the boarder paſs a-head, veer under his ſtern, and rake him, if he does not anticipate this manœuvre, and as quickly manœuvre in the ſame manner; the great velocity with which he comes to the wind, and goes a-head, his ſails being ſtill full, reducing him to this ſtate, which may prevent his perſiſting in the deſign of boarding. Nevertheleſs the boarder may attain his purpoſe, if he throws all his ſails a-back at the ſame time as the ſhip to windward; becauſe, the attacked ſhip dropping to leeward, and having ſtern-way firſt, approaches the boarder, who has preſerved his poſition on the quarter, and longer kept his luff, by having gone a-ſtern ſomewhat later than the weather ſhip. It ſhould alſo be obſerved, that when the two ſhips are right before the wind, if the veſſel which fears boarding moves more quickly to the wind than the one which attacks, ſhe will avoid it, as the retreating ſhip will be cloſe to the wind before the other, and able to get a-head of her, by making all ſail to keep her wind, or to heave in ſtays, and get upon the other tack. This laſt movement, however, is diſadvantageous; becauſe it will preſent the ſtern to a ſhip, which will avail itſelf of that ſituation, and rake her, and this may be more deſtructive than a well oppoſed attack by boarding. After all, if the ſhip that is inclined to board ſails better than the other, ſhe will always have it in her power to execute her purpoſe, if ſhe is as well manœuvred as the ſhip which endeavours to eſcape.

In the ſecond caſe of boarding to leeward, when cloſe to the wind, the boarder ſhould arrive within piſtol ſhot, cloſe in the

the wake, or, at moſt, to the weather quarter of the ſhip againſt which the attack is meditated; taking care to continue ſteering, ſo as not to be raked by any of the guns that belong to the quarter on which he ſtands. In order to come up with his adverſary, he muſt edge away a little, and range round aft, ſo cloſe upon the enemy's lee-quarter, that his cat-head may almoſt touch her quarter-gallery. When the ſhip has ſhot ſufficiently a-head, and is parallel to that of the adverſary, the fore-caſtle being a-breaſt of the enemy's main-maſt, the mizen and mizen ſtay-ſail ſheets are to be well hauled aft, the helm put hard a-lee, and the head-ſheets let fly; then the ſhip, coming rapidly to the wind, ſhivers her ſails, and cloſes with the oppoſing veſſel ſide to ſide. In executing this manœuvre, which cannot fail to ſucceed with the advantage of ſailing, great attention is neceſſary; becauſe, if at this moment the weather-ſhip, which wiſhes to avoid being boarded, either ſets her courſes, or lays all thoſe flat a-back which ſhe had ſet, ſhe may chance to break the grapnels, if the ſails of the boarding veſſel have not been trimmed like thoſe of the other; for, by making more ſail if the wind be a little freſh, ſhe will ſhoot a-head through the water, and drag the boarder with ſuch force as to break the chains or hawſers by which the two ſhips are confined together. By laying all flat to the maſt the boarded veſſel is ſtill more likely to ſucceed, ſince the ſails of one ſhip will be full, while thoſe of the other are a-back.

This mode of boarding may be avoided, if the boarder does not pay ſtrict attention to his own manœuvres, as well as to thoſe of his adverſary; and it may be more readily avoided, if the adverſary's veſſel braces her head-ſails ſharp a-back, ſetting only, if neceſſary, the fore-ſail, at the ſame inſtant laying to the maſt or ſhivering, according to the neceſſity for more or leſs ſtern-way, all thoſe which are abaft, and putting the helm hard a-lee. This is to be executed, when the boarder is about a ſhip's length a ſtern of the other veſſel. The quickneſs of this evolution, and the rapid veering of the weather-ſhip, may bring the boarding veſſel, which is a little to leeward or a-ſtern of the other, into the moſt dangerous ſituation, if ſhe does not manœuvre in the ſame manner, and with equal celerity; as the boarder's ſails being full, keep up his velocity, and may, before he can veer, engage his bowſprit in the main ſhrouds of the enemy, who pays ſhort round on her head. Thoſe who wiſh to board a ſhip, and to engage the enemy's bowſprit in their main ſhrouds, need only to get a little to windward of her, and about one or two ſhip's lengths a-head, according to the eſtimated celerity of their movements; then brace ſharp a-back the head ſails, ſhiver the after-ones, or lay them flat to the maſt, with the helm a-lee. This manœuvre, well performed, and covered by a briſk fire, will commonly ſucceed; but care muſt be taken not to come round too ſoon, but to range very cloſe to the adverſary; becauſe if the boarding veſſel be not ſufficiently a-head of him, it might fail in boarding by paying too ſhort round, and its bowſprit get foul of his fore ſhrouds, which would be very diſadvantageous. The deſign will be fruſtrated, if the boarding ſhip being too far a-head, paſſes under the bowſprit of the enemy, who will thus, however, be expoſed to be raked at his head, if he does not manœuvre in the ſame manner and equal quickneſs as the boarding veſſel, which has the great advantage of priority. In order to engage the bowſprit of the enemy's ſhip in the rigging of the boarding veſſel, this ſhould be ranged very cloſe to the other; becauſe, if this were attempted at only a ſhip's length large, and to windward of the enemy, he need merely, upon perceiving the deſign, to put the helm hard a-lee, and heave in ſtays. If this laſt method be properly executed, the two ſhips can only range very near each other, and exchange their broadſides, and the lee-ſhip will immediately gain the wind of her adverſary. Conſequently to execute this manœuvre well, the veſſels muſt be nearly yard-arm and yard-arm.

If the boarder be at a certain diſtance aft on the weather-quarter, the ſhip wiſhing to avoid boarding muſt heave in ſtays, as ſoon as the other veſſel is in the act of veering, in order to cloſe with her to leeward. By this manœuvre they will come head to head, ſo that they may reciprocally fire their broadſides, in paſſing on oppoſite directions, and the lee-ſhip will get to windward.

In the third caſe, when two ſhips engage with the wind large, the boarding veſſel ſhould keep as cloſe as poſſible on the lee-quarter of the ſhip ſhe means to attack by boarding, that ſhe may execute her purpoſe by coming rapidly to the wind, and being careful not to paſs a-head of her opponent. The weather-ſhip, in order to avoid being boarded, muſt act according to circumſtances, in the manner directed in the laſt caſe. A ſhip may be boarded on the weather-ſide, by conforming to the inſtructions relating to boarding to windward. When two veſſels are engaged with the wind right aft, the boarder ought to drop a-ſtern of the enemy, in order to run up cloſe along-ſide of him, if the boarder has the advantage of ſailing; for, as ſhe then advances towards her adverſary, the adverſary can only endeavour to range rapidly to the wind on the other tack, as ſoon as the bowſprit of the boarder is a-breaſt of her ſtern, and thus gain the wind, in order to be in a ſituation to extricate herſelf more eaſily by a good manœuvre. The boarding veſſel ſhould be allowed to come a-breaſt of the ſtern of her adverſary, before ſhe hauls her wind; becauſe, if this were done ſooner, the ſhip a-ſtern, at a ſmall diſtance, would board her perfectly well, even if ſhe ſailed with equal celerity, ſince the boarder would be to windward, would run large longer than the other, would range more ſlowly to the wind, and continue to ſtem a-head of the flying ſhip. This will appear more evident by conſidering, that the boarder coming from windward preſerves his velocity longer, trimming his ſails only as the ſhip comes to the wind, and cuts the courſe of his adverſary with a line leſs curved than that deſcribed by the retreating ſhip. If, by coming too ſoon or too faſt to the wind, the boarder choſe to abandon his deſign, he might do ſo by veering a few points on the other tack, and ſhortening ſail; ſo that the retreating ſhip will ſhew her ſtern, and the boarder can then rake her by paſſing under her ſtern.

In attacking a ſhip cloſely to leeward, the boarder ſhould keep away a little when abreaſt of her, and ſeem to yield under her fire. If the enemy's ſhip ſhould thus be induced to veer, in order to bring the boarder more under her guns, the latter ſhould heave rapidly to the wind, by putting the helm a-lee, trimming all ſharp a-baft, and ſuppreſſing the effect of the head ſails; which ſhould be done at the inſtant when the enemy is perceived to be bearing down. The two ſhips will by the quickneſs of this manœuvre, and the priority of the movement thus gained on the enemy, ſoon cloſe, and, with proper attention, the enemy's bowſprit may be entangled in the fore or main rigging of the boarding veſſel, which would be a favourable circumſtance in the attempt to board. However it may happen that no attempt can be made to board, if the weather-ſhip, inſtead of bearing away, plies more and more to windward; for this faint manœuvre may take the boarder too far off to leeward of the adverſary. If the boarder ſhould chance to be a ſhip's length to leeward, and about the ſame diſtance a-head of the enemy's veſſel, it may, under cover of a heavy fire, heave in ſtays; and thus come right athwart the enemy's hawſe, rake him fore and aft, and board him, his bowſprit being

right

right over the enemy's gang-way; nor can he poſſibly avoid a broadſide; for if he heave all a-back and make a-ſtern board, which is his only reſource, he may avoid being boarded, but his ſituation will be very perilous.

In the laſt caſe of boarding a ſhip, which is at anchor, riding head to wind, it muſt be executed under ſail; for if the boarder cannot approach the enemy except by towing a-head, he will never be able to board the latter againſt his will; becauſe he will be always able to annoy the boats which are laying out the tow-lines. It ſhould not therefore be attempted, unleſs the boarder be under way. In order to perform it with ſucceſs, the boarder muſt be ſufficiently to windward to approach the enemy by a little falling off, without expoſing his ſtern to the fire of the latter, which in this ſituation might be played on with great advantage. If the boarder, then, ſhould be thus to windward, ſo as to be able to approach the enemy at anchor, he ought to ſtop his head-way, by taking a-back his mizen topſail and fore-ſtay-ſail; and when about a ſhip's length from the veſſel propoſed to be boarded, let go an anchor, and then work, ſo that, as ſoon as the mizen top ſail is taken a-back, the mizen cloſe aft, the top-ſails clued up, and the fore-topmaſt ſtay-ſail hauled down, he may come head to wind, and veer away cable, till, by falling off, he comes board and board with his opponent, who is ſtill riding at his moorings, and who at that inſtant ought to be alſo raked by the boarder. This is the only method of manœuvring to which the boarding ſhip can recur; becauſe, as ſoon as the anchor is gone, the ſhip acquires ſtern-way, and when the cable is checked, ſhe runs head to wind, in which ſhe is much aſſiſted by the mizen and mizen top-ſail, which impel her ſtern to leeward, till the wind is right in the direction of the keel; and, as the cable is veered away, till exactly along-ſide the ſhip at anchor, her own anchor being right a-head of the veſſel ſhe means to board, it follows that, as ſoon as the boarding ſhip comes head to wind, ſhe is in a proper ſituation to throw her grapnels, and ſend her crew on board of the other, if they are the ſtrongeſt.

The ſhip at anchor ſhould never wait for the enemy in that ſituation, which is always diſadvantageous, and as there is much greater probability of eſcape when under way. But if it be neceſſary for the enemy to continue at anchor, he ſhould take advantage of the boarder's ſhip letting go her anchor, to cut the cable by which ſhe rides; and by this manœuvre fall athwart, rake the boarder, avoid being boarded, and bring up with the lee anchor. If time allow, two ſprings ſhould be caſt out, one on each ſide of the cable by which the ſhip rides, if there have been no previous opportunity for laying out two anchors, and thus guard againſt ſurpriſe, in caſe the ſhip which attacks has it in her power to paſs on either ſide of the other; and when the ſide for which ſhe is determined is perceived, the aſſailed ſhould heave on the ſpring which is on the ſame ſide ſhe has let go her anchor, if ſhe be a-head, and on the oppoſite, if ſhe be a-ſtern, veering out at the ſame time the other ſpring and cable, till the aſſailant be brought right a-breaſt. Then he may be raked at pleaſure, as he has no way of eſcape. His only courſe to prevent danger would be having alſo a ſpring; and under cover of a briſk fire, veering upon that ſpring and cable to lay his enemy handſomely on board. But if this precaution ſhould have been neglected, he muſt cut his cable, and drop on board of the ſhip to leeward; who on the other hand, has no mode of avoiding being boarded, but by cutting, to get under way, or to run on ſhore.

It is always eaſy to board a ſhip at anchor, when the wind will allow approaching to her under ſail; in which caſe it is moſt adviſeable to run her along ſide, or to bring-to to windward of the ſhip intended to be attacked, keeping her exactly to leeward; then to drift on board of her, by trimming the ſails in ſuch a manner as to keep as nearly as poſſible the broadſide of the attacking veſſel oppoſite to that of the adverſe ſhip. In this ſituation the boarder ſhould annoy the enemy with his guns till he can cloſe with him; and by conſtantly cannonading, his fire may not be ſo well ſerved as it otherwiſe might be. If, whilſt a veſſel is under-way, it be propoſed to board a veſſel that is moored, an anchor ſhould be let go at the time of boarding; for if the attacked ſhip ſhould at this moment cut her cables to drive on ſhore, this would prevent the aſſailant and the aſſailed running a-ground together. Elements and Practice of Rigging and Seamanſhip, vol. ii. Bourdé's Manœuverer, or Skilful Seaman, &c. tranſlated from the French by Sauſeuil, 4to. 1788.

Boarding-*netting*, in *Ship Rigging*. See Netting.

BOARI, in *Geography*, a village of Africa, on the Gold Coaſt, ſituated between Sukonda and Sama, where the Dutch had formerly a ſmall factory, which was afterwards removed to Sama.

BOARI Lappa a name given by the antient Romans to the fruit or rough balls of the common aparine or cleavers. Pliny calls this plant ſometimes *lappa*, ſometimes *lappago*; and the fruit by the names of *lappæ boariæ*, or *lappæ caninæ*, and ſometimes *canariæ*.

BOARINA, Boarola, in *Ornithology*, the name of a ſmall bird, deſcribed by Aldrovandus and others. This is the fig-eater of Albin and Latham; and *Motacilla Nævia* of Gmelin.

BOARULA, a ſpecies of Motacilla, called in England the grey wagtail. The colour of this bird is cinereous above, beneath yellow; tail-feathers dark, and pale at the edges. This is an European bird, about ſeven inches and a half in length, and, like the reſt of the wagtail tribe, frequents watery places. They are lively, active birds, perpetually flirt the tail, and ſeldom perch, but reſt upon the ground. They feed chiefly upon inſects. The neſt of this ſpecies is made on the ground, and is compoſed of dried fibres and moſs, lined with wool or feather, and uſually contains from ſix to eight eggs, which are of a dirty white, marked with yellow ſpots. They breed in the north of England, ſeldom approaching nearer to the ſouthward than Cumberland, till after the month of October. Linn. Donov. Brit. Birds, pl. 40, &c. *Le Bergette*, of Belon; and *la Bergoronette jaune*, of Briſſon, is of this ſpecies.

Obſ. A variety of *Motacilla Boarula* inhabits Java. The colour is an olive brown, beneath yellow; lower part of the neck grey; firſt tail-feather entirely white; innerſide and tip of the ſecond and third white.

BOAS, in *Entomology*, a ſpecies of Scarabæus, that inhabits Sierra Leona. The thorax is retuſe, excavated, bidentated; horn of the head recurved and ſimple. Fabricius.

BOAT, a ſmall veſſel, generally without a deck, managed by ſails or oars, or drawn by horſes upon canals, rivers, or lakes, for the purpoſe of conveying paſſengers, goods, &c. from one place to another. The form, equipment, and names of boats are different according to the purpoſe for which they are intended, or to the country where they are built. Hence, boats are made ſlight or ſtrong, ſharp or flat-bottomed open or decked, plain or ornamented, as they may be deſigned for ſwiftneſs or burden, for deep or ſhallow water, for ſailing in a harbour or at ſea, and for convenience or pleaſure.

As boats make always a neceſſary appendage to ſhips it will,

will, therefore, be proper to give a brief account of those belonging to the different classes of shipping.

Ships of war, particularly of the line, have usually six boats; and the number decreases with the rate of the ship. The largest is called the *long-boat*, and sometimes the *launch*; and its principal employment is to convey heavy stores to the ship. This boat is generally furnished with a mast and sails, and is occasionally decked, armed, and equipped, for cruising short distances against merchant ships of the enemy, or smugglers, or for impressing seamen, &c. The *barge* is the next less boat, and is particularly appropriated to carry the principal sea officers, as the admiral, captain, &c. to or from the ship; and in consequence of its slender construction, combined with its small breadth, is very unfit for sea. This boat never rows less than ten oars. The *pinnace* is similar to the barge, but smaller, never rows above eight oars, and is used by lieutenants in going ashore, or coming off to the ship. *Cutters* are broader, deeper, and shorter than the former; they are employed on almost all occasions, as for going ashore, carrying stores, provisions, boarding ships at sea, &c. *Jolly-boat* is the smallest boat used in any of the ships in his majesty's service. In *Plate* VI of *Ships* are perspective views of a man of war's long-boat, of a barge, and flat-bottomed boat.

In an East Indiaman there are four boats, the *long boat*, *cutter*, *jolly-boat*, and *yawl*. The first of these is for conveying stores and goods to and from the ship; the second for going ashore; and the others are employed occasionally.

Ships in the West India trade use boats in number and size according to the islands at which they intend to take in their cargo. Four boats generally belong to a ship in the Jamaica trade. The largest, called a *shallop*, will carry from eighteen to twenty hogsheads of sugar. The next less in size is usually called a *ten hogshead boat*, from the number of hogsheads it carries; these two are left in the country. The next less boat called a *double moses*, or *pinnace*, carries two hogsheads a short distance; and the smallest boat is called the *jolly-boat*, and is generally suspended from the taffrail.

Ships in the Windward Island trade, loading at Barbadoes, Martinico, Dominica, &c. generally use a flat launch with skeeds, each about thirty-six feet long, one end being upon the boat's stern, and the other upon the beach, upon which the sugar hogsheads are rolled from the beach into the launch. At St. Vincent's, Grenada, and Tobago, a one hogshead moses is used. At Trinidad a launch as flat as can be built is used. At Demerara, Berbice, and Surinam, they generally use sailing craft that will carry from twelve to twenty hogsheads.

Ships employed in the whale fishery have six or more boats. These are very narrow in respect to their length, for the purpose of pulling fast; they are strong built, and sharp at both ends.

Smaller vessels of one hundred tons and under, have in general one boat.

Bachot, a fishing boat on the rivers in France; it is provided with a mast, oars, fishing lines, a staff, a pole to fasten their boat on the river when they are fishing, &c.

Balza or *balsa*, a boat, or rather raft, composed of five, seven, or nine logs or trunks of trees, used in South America. This boat is so called from balza or balsa, the name of the wood of which it is constructed, but which is called puero by the Darien Indians. The balza is a whitish spungy wood, and so very light that a boy can easily carry a log four yards long and a foot in diameter. The following account of this boat is extracted from the Relacion Historica del Viage a la America Meridional, necho de Orden, de S. Mag, &c. Impressa de Orden de Rey en Madrid, 1748.

The balzas are not only adapted to this river (Guayaquil), but venture to sea, and carry on the trade as far as Payta. Their dimensions are proportionate to their use, or the voyage for which they are intended; some being only for fishing, others for the river trade, bringing fruits, and all sorts of merchandize from Bodega to Guayaquil, and from thence exporting them to Puna, Salto de Tumbez, and Payta; others are yet more commodiously contrived for carrying families, with all their furniture and necessaries, to their plantations or country houses. The puero trees, of which they are built, are twelve or thirteen toises long, reckoning five feet to the toise, and two feet, or two and a half diameter, so that the whole breadth of nine logs, of which some of them consist, is between twenty and twenty-four feet; and those of seven or fewer logs are proportionate.

These logs are fastened to each other only by the bejucos or withies, with which the cross logs are also lashed to them, yet so securely as never to give way, if not worn out by long use, though in their voyage to the coast of Tumbez and Payta the sea runs very high; but the negroes neglecting to examine if the bejucos are not too much worn to sustain another voyage, before they put to sea, it too often happens that the lashing breaks, the logs separate, and both cargo and passengers perish: indeed the Indians, being more active, get upon a log and safely work it to the nearest harbour. One of these melancholy instances happened while we were in the jurisdiction of Quito, and are wholly to be imputed to the sordid negligence of the Indians, who seem to have no sensibility of danger.

The thickest log of the balza is placed so as to reach farther than the others; at the stern, another log is lashed to this, on each side, and others to these, till the intended number be completed, which is always odd; the large one in the middle being, as it were, the stay and foundation of the others. The larger sort of these vessels usually carry about twenty-five tons, without damaging the cargo in consequence of its being too near the water's edge, for the sea never breaks over them, nor does the water swell between the logs, or ever rise above them, because the whole body of the vehicle accommodates itself to the motion of the water in all weathers.

These rafts work and ply to windward like a keeled vessel, and keep their course before the wind almost as exactly, which is the effect of another contrivance besides the rudder; some large planks, three or four yards long, and half a yard broad called guares, are set up vertically at the stern, and also forward between the main logs. By pushing some of these under the water, and taking others a little up, the float sails large, bears up, tacks, or lies to, according as the machine is worked; an invention which has hitherto escaped the acuteness of the most ingenious Europeans; and though the Indians have indeed contrived the instrument, yet they are utter strangers to the principles of mechanics, and the causes of its operations.

Had it been known before in Europe, the loss of many lives in shipwreck might have been prevented, as appears by the following, among many other instances: in the year 1730, the Genouesa ship of war, being lost in the Vivora, the mariners made a jangada, or raft, to save their lives, but miscarried by committing themselves to the winds and currents, without any steerage; and the frequency of such melancholy events induces me to give a minute explanation of this instrument, from a memoir of Don Jorge Juan, relating to it.

The direction in which a ship moves, when under sail, is in a line perpendicular to the sail, according to the demonstrations of Renau, in his Theory of Manual Arts, cap. ii. art. 1. Bernouilli, cap. i. art. 4; and Pitot, sect. ii. art. 13. The

re-action being equal, and opposite to the action, the opposition of the water to the motion of the vessel will also be in a direction perpendicular to the sail, from leeward to windward, and the impulse of a longer body exceeding that of a smaller, supposing the motion of both to be equal, it follows that, upon one of the fore guares being thrust under water, the vessel will lie to, and bear up again, if it be taken out; and by a parity of reasoning, an after one being thrust under water will cause the ship to bear up and to lie to, on its being taken out. The way used by the Indians, in managing the balza, is to increase the number of guares to four, five, or six, to keep her to windward; for it is evident that the more there are under water the greater will be the lateral resistance, which is thus increased by the lee-boards used in smaller vessels, and for the same purpose. These guares so effectually answer the end for which they are intended, that, when once the balza is underway, only one need be worked; and by thrusting it down or raising it up a foot or two, the vessel is kept in a right course. *Plate* I. of *boats*, contains a perspective view of a Balza.

Barge, the second boat in a ship of war, as mentioned above; a vessel employed in carrying merchandize in the river Thames, with one mast. See also the article BARGE.

Bum boat, a small boat employed in selling vegetables, &c. to vessels lying at a distance from the shore.

Bunder boat, a boat at Bombay for carrying off pilots to a ship, and taking passengers ashore.

Chalaud, a boat navigated on the river Loire in France; these boats are narrow and low, for the purpose of more easily passing through the locks of canals: they are principally used in carrying wines and other productions, and merchandizes of the provinces, which lie near the Loire and Allier.

Coolie, a boat employed as a wherry at Bombay; it has one mast, with a considerable rake forward, and sails very fast.

Felucca, is a strong passage-boat used in the Mediterranean, having from 10 to 16 banks of oars. The natives of Barbary often employ boats of this sort as cruisers.

Ferry-boats, are used for conveying passengers, goods, horses, cattle, &c. across a river or branch of the sea; and, therefore, are of different dimensions and forms of construction accordingly.

Fishing boats, are of various kinds; those employed in the salmon fishing, which is generally in rivers, or at the sea shore, and commonly called *cobles*, are narrow at one end, and broad at the other, for the purpose of making up the net upon it, and from which the net is let into the river or sea. Boats employed in the white fishery, that is, in taking ling, cod, haddocks, &c. are pretty large; some carrying ten tons and upwards, with two masts, with a square or lug-sails, and strong built so as to endure a rough sea; they are usually and unequally sharp at both ends, the sharpest end being the bow. Decked vessels called *smacks* having one mast, or *luggers* with three masts, are employed in this fishery.

Flat-bottomed boat, is so constructed for taking the beach easily, for the greater convenience of landing troops with their baggage, accoutrements, &c.

Flottes, boats of the master ferryman at Paris. The ordnance of that city, made in the year 1672, enjoins them to keep their boats always provided with slaves and oars; and to have a sufficient number of boats ready at the places and services appointed by the provost of the merchants and echevins

Foncets, boats which navigate on the river Seine; they are large, long, and strong; they come from Roan, and from the river Oise, and are commonly used to carry great loads of wood for fuel, also goods, &c.

Gig, a small light boat, usually suspended from the taff-rail of a ship.

Holland, Boats of. In almost all the Seven United Provinces there are boats which serve for public carriages, which set out from every city at all hours of the day, and carry passengers very conveniently from one place to another, at a very small expence. They are long, narrow, and covered, and contain about sixty persons; each boat is drawn by one horse, and has only two men to manage it, the one attends the helm, and the other takes care of the rope; the horse is generally rode by a boy. In these boats there is a room which can easily contain six persons; this room, which is called a *roef*, has glass windows, whereas the other openings in the boat are shut with oil cloth in bad weather. A passenger may take a place in this room, or the whole room. Those boats which carry goods from Amsterdam to the Hague, and which leave Amsterdam at eight at night, arrive at the Hague next morning. In those boats, however, designed for passengers only, a person is obliged to change boat several times. From Amsterdam to Haerlem he must change boats half way, because the canal there is cut by a dyke. At Haerlem, the passengers must cross the town to get to the boat that is to carry them to Leyden. At Leyden, he must again cross the town to meet the boat in which he is to go to the Hague. All this can be performed in ten hours and a half; for, at eight o'clock precisely, a boat sets out from Amsterdam to Haerlem, where it arrives about half an hour after ten; at eleven a boat sets out from Haerlem for Leyden, and arrives there at three in the morning; half an hour after three a boat sets out from Leyden, and arrives at the Hague half an hour after six. There is such good order kept, that at the ringing of a bell the boat must set out immediately, without waiting for any passenger. There are few countries where people can travel so conveniently as in Holland.

Ivahah, a boat or canoe of the Society Islands, of which captain Cook gives the following description. The ivahah is used for short excursions at sea. These boats are all of the same figure, but of different sizes, and used for different purposes; their length is from ten to seventy-two feet, but the breadth is by no means in proportion; for those of ten feet are about a foot wide, and those of more than seventy are scarcely two feet. They have the fighting ivahah, the fishing ivahah, and the travelling ivahah, for some of these go from one island to another. The fighting ivahah is by far the longest; and the head and stern are considerably raised above the body, in a semicircular form, particularly the stern, which is sometimes seventeen or eighteen feet high, though the boat itself is scarcely three feet. These never go to sea singly, but are fastened together side by side at the distance of about three feet, by strong poles of wood, which are laid across them, and lashed to the gunwales. Upon these in the fore part, a stage or platform is raised about ten or twelve feet high, and somewhat wider than the boats, which is supported by pillars about six feet long; upon this stage stand the fighting men, whose missile weapons are slings and spears; for, among other singularities in the manners of these people, their bows and arrows are used only for diversion as we throw quoits; below these stages sit the rowers, who receive from them those that are wounded, and furnish fresh men to ascend in their room. Some of these have a platform of bamboos, or other light wood, through their whole length, and considerably broader, by means of which they can carry a great number of men. The fishing ivahahs vary in length from about forty feet to the smallest size, which is about ten feet; all that are of the length of twenty-five feet and upwards, of whatever sort, occasionally carry sail. The travelling ivahah is always double, and furnished with a small neat house, about five or

ſix feet broad, and ſix or ſeven feet long, which is faſtened upon the fore part, for the convenience of the principal people, who ſit in them by day, and ſleep in them at night. The fiſhing ivahahs are ſometimes joined together, and have a houſe on board, but this is not common. Thoſe which are ſhorter than twenty-five feet, ſeldom or never carry ſail; and though the ſtern riſes about four or five feet, they have a flat head and a board that projects forward about four feet. The ivahahs are the only boats uſed by the inhabitants of Otaheite.

Life-boat, a boat invented by Mr. Henry Greathead of South Shields, for the purpoſe of preſerving the lives of ſhipwrecked perſons. The following circumſtance gave riſe to this invention:

In September 1789, the ſhip Adventure of Newcaſtle, was ſtranded on the Herd ſand, on the ſouth ſide of Tynemouth haven, in the midſt of tremendous breakers; and all the crew dropped from the rigging one by one, in the preſence of thouſands of ſpectators, not one of whom could be prevailed upon, by any reward, to venture out to her aſſiſtance, in any boat or coble of the common conſtruction.

On this occaſion, the gentlemen of South Shields called a meeting of the Inhabitants, at which a committee was appointed, and premiums were offered for plans of a boat which ſhould be the beſt calculated to brave the dangers of the ſea, particularly of broken water.

Many propoſals were offered; but the preference was unanimouſly given to that of Mr. Greathead, who was immediately directed to build a boat at the expence of the committee.

This boat went off on the 30th of January 1790; and ſo well has it anſwered, and indeed exceeded, every expectation, in the moſt tremendous broken ſea, that ſince that time, not fewer than two hundred lives have been ſaved at the entrance of the Tyne alone, which otherwiſe muſt have been loſt; and in no inſtance has it ever failed.

The principle of this boat appears to have been ſuggeſted to Mr. Greathead by the following ſimple fact.—Take a ſpheroid, and divide it into quarters; each quarter is elliptical, and nearly reſembles the half of a wooden bowl, having a curvature with projecting ends; this, thrown into the ſea or broken water, cannot be upſet, or lie with the bottom upwards.

The length of the boat is thirty feet; the breadth, ten feet; the depth, from the top of the gunwale to the lower part of the keel in midſhips, three feet three inches; from the gunwale to the platform (within), two feet four inches; from the top of the ſtems (both ends being ſimilar) to the horizontal line of the bottom of the keel, five feet nine inches. The keel is a plank of three inches thick, of a proportionate breadth in midſhips, narrowing gradually towards the ends, to the breadth of the ſtems at the bottom, and forming a great convexity downwards. The ſtems are ſegments of a circle, with conſiderable *rakes*. The bottom ſection, to the floor heads, is a curve fore and aft, with the ſweep of the keel. The floor timber has a ſmall riſe curving from the keel to the floor-heads. A bilge plank is wrought in on each ſide next the floor-heads, with a double rabbit or groove, of a ſimilar thickneſs with the keel; and, on the outſide of this, are fixed two bilge-trees, correſponding nearly with the level of the keel. The ends of the bottom ſection form that fine kind of entrance obſervable in the lower part of the bow of the fiſhing boat, called a *coble*, much uſed in the north. From this part to the top of the ſtem it is more elliptical, forming a conſiderable projection. The ſides, from the floor-heads to the top of the gunwale, flaunch off on each ſide, in proportion to above half the breadth of the floor. The breadth is continued far forwards towards the ends, leaving a ſufficient length of ſtraight ſide at the top. The ſheer is regular along the ſtraight ſide, and more elevated towards the ends. The gunwale fixed to the outſide is three inches thick. The ſides, from the underpart of the gunwale, along the whole length of the regular ſheer, extending twenty-one feet ſix inches, are caſed with layers of cork, to the depth of ſixteen inches downwards; and the thickneſs of this caſing of cork being four inches, it projects at the top a little without the gunwale. The cork, on the outſide, is ſecured with thin plates or ſlips of copper, and the boat is faſtened with copper nails. The thwarts, or ſeats, are five in number, *double-banked*; conſequently the boat may be rowed with ten oars. The thwarts are firmly ſtanchioned. The ſide oars are ſhort, with iron tholes and rope grommets, ſo that the rower can pull either way. The boat is ſteered with an oar at each end; and the ſteering oar is one third longer than the rowing oar. The platform placed at the bottom, within the boat, is horizontal, the length of the midſhips, and elevated at the ends, for the convenience of the ſteerſman, to give him a greater power with the oar. The internal part of the boat next the ſides, from the under part of the thwarts down to the platform, is caſed with cork; the whole quantity of which, affixed to the life-boat, is nearly ſeven hundred weight. The cork indiſputably contributes much to the buoyancy of the boat, is a good defence in going along-ſide a veſſel, and is of principal uſe in keeping the boat in an erect poſition in the ſea, or rather for giving her a very lively and quick diſpoſition to recover from any ſudden *cant* or *lurch*, which ſhe may receive from the ſtroke of a heavy wave. But, excluſively of the cork, the admirable conſtruction of this boat gives it a decided pre-eminence. The ends being ſimilar, the boat can be rowed either way; and this peculiarity of form alleviates her in riſing over the waves. The curvature of the keel and bottom facilitates her movement in turning, and contributes to the eaſe of the ſteerage, as a ſingle ſtroke of the ſteering oar has an immediate effect, the boat moving as it were upon a centre. The fine entrance below is of uſe in dividing the waves, when rowing againſt them; and, combined with the convexity of the bottom, and the elliptical form of the ſtem, admits her to riſe with wonderful buoyancy in a high ſea, and to launch forward with rapidity, without ſhipping any water, when a common boat would be in danger of being filled. The flaunching or ſpreading form of the boat, from her floor-heads to the gunwale, gives her a conſiderable bearing; and the continuation of the breadth, well forward, is a great ſupport to her in the ſea; and it has been found by experience, that boats of this conſtruction are the beſt ſea boats for rowing againſt turbulent waves. The internal ſhallowneſs of the boat from the gunwale down to the platform, the convexity of the form, and the bulk of cork within, leave a very diminiſhed ſpace for the water to occupy; ſo that the life boat, when filled with water, contains a conſiderable leſs quantity than the common boat, and is in no danger either of ſinking or overturning. It may be preſumed by ſome, that in caſes of high wind, agitated ſea, and broken waves, a boat of ſuch a bulk could not prevail againſt them by the force of oars; but the life-boat from her peculiar form, may be rowed a-head, when the attempt in other boats would fail. Boats of the common form, adapted for ſpeed, are of courſe put in motion with a ſmall power; but for want of buoyancy and bearing, are over-run by the waves, and ſunk, when impelled againſt them; and boats conſtructed for burthen meet with too much reſiſtance from the wind and ſea, when oppoſed

to them, and cannot in ſuch caſes be rowed from the ſhore to a ſhip in diſtreſs.

Mr. Greathead gives the following inſtructions for the management of the life-boat.

The boats, in general, of this deſcription are painted white on the outſide; this colour more immediately engaging the eye of the ſpectator when riſing from the hollow of the ſea than any other. The bottom of the boat is at firſt varniſhed (which will take paint afterwards) for the more minute inſpection of purchaſers. The oars ſhe is equipped with are made of fir, of the beſt quality; having found by experience, that a rove aſh oar, that will dreſs clean and light, is too pliant among the breakers; and when made ſtrong and heavy, from rowing double-banked, the purchaſe being ſhort, ſooner exhauſts the rower, which makes the fir oar, when made ſtiff, more preferable.

In the management of the boat ſhe requires twelve men to work her; that is, five men on each ſide rowing double-banked, with an oar ſlung over an iron thole, with a grommet (as provided), ſo as to enable the rower to pull either way, and one man at each end to ſteer her, and to be ready at the oppoſite end to take the ſteer-oar, when wanted. As, from the conſtruction of the boat, ſhe is always in a poſition to be rowed either way, without turning the boat; when manned, the perſon who ſteers her ſhould be well acquainted with the courſe of the tides, in order to take every poſſible advantage: the beſt method, if the direction will admit of it, is to head the ſea. The ſteerſman ſhould keep his eye fixed upon the wave or breaker, and encourage the rowers to give way, as the boat riſes to it; being then aided by the force of the oars, ſhe launches over it with vaſt rapidity, without ſhipping any water. It is neceſſary to obſerve that there is often a ſtrong reflux of ſea occaſioned by the ſtranded wrecks, which requires both diſpatch and care in the people employed, that the boat be not damaged. When the wreck is reached, if the wind blows to the land, the boat will come in ſhore without any other effort than ſteering.

The following additional obſervations and inſtructions are given by Mr. Hinderwell of Scarborough.

The life-boat at Scarborough is under the direction of a committee. Twenty-four fiſhermen, compoſing two crews, are alternately employed to navigate her. A reward, in caſes of ſhipwreck, is paid by the committee to each man actually engaged in the aſſiſtance; and it is expected the veſſel receiving aſſiſtance ſhould contribute to defray this expence. None have hitherto refuſed.

It is of importance that the command of the boat ſhould be entrusted to ſome ſteady experienced perſon, who is acquainted with the direction of the tides or currents, as much ſkill may be required in riſing them to the moſt advantage, in going to a ſhip in diſtreſs. It ſhould alſo be recommended, to keep the head of the boat to the ſea, as much as circumſtances will admit; and to give her an accelerated velocity to meet the wave, much exertion is neceſſary in approaching a wreck, on account of the ſtrong reflux of the waves, which is ſometimes attended with great danger. In a general way, it is ſafeſt to go on the lee quarter; but this depends on the poſition of the veſſel; and the maſter of the boat ſhould exerciſe his ſkill in placing her in the moſt convenient ſituation. The boatmen ſhould practiſe themſelves in the uſe of the boat, that they may be the better acquainted with her movements; and they ſhould at all times be ſtrictly obedient to the directions of the perſon who is appointed to the command.

Plate II. of *Boats* contains a perſpective view of the life-boat riſing over a heavy ſurge, and going out to the aſſiſtance of a ſhip, which appears in the horizon in diſtreſs. In the life-boat are ten rowers pulling to get to the ſhip. At the lower end of the boat, a man is ſteering her with a long oar towards the ſhip; and another perſon is ſtationed with an oar at the higher end, to ſteer the boat on her return; both ends of the boat being formed alike, in order to uſe either at pleaſure in going to or coming from the ſhip. The ſheer, or curve of the boat, riſing conſiderably from the middle to the ſtems, or ends, is clearly diſtinguiſhed; alſo the coating of cork ſecured by ſlips of copper along the outſide of the boat, near the part where the rowers are ſeated.

As every thing relating to this important invention muſt be intereſting to the public, it is, therefore, preſumed the following additional information will not be unacceptable, eſpecially as it contains the ſtrongeſt evidence of the great utility of this boat.

The life-boat having been ſubmitted to a teſt of twelve years' experience, during which period Mr. Greathead ſacrificed a very conſiderable portion of his time in furniſhing plans, and otherwiſe rendering the invention as extenſively uſeful as he could; on the 25th of February 1802, he preſented a petition to the houſe of commons, the prayer of which was as follows:

"Your petitioner having been inſtrumental in ſaving the lives of ſo many perſons; the utility of the boat being now eſtabliſhed; and your petitioner having derived little or no pecuniary advantage whatever from the invention, his models having been made public; humbly hopes, that this honourable houſe will take his caſe into their conſideration, and grant your petitioner ſuch reward as to this honourable houſe ſhall ſeem meet, &c."

The petition, having been recommended by his majeſty, was referred to the conſideration of a committee; from whoſe report the following is a brief abſtract.

"It appeared to your committee to be neceſſary to direct their inquiries particularly to the three following ſubjects.

"1ſt. The utility of the life-boat.

"2dly. The originality of the invention claimed by Mr. Greathead.

"3dly. Whether he had received any and what remuneration.

"And in order to aſcertain theſe facts, your committee proceeded to examine,

"Ralph Hillery, a ſeaman, who ſtated, that he had been forty-five years at ſea, in the Greenland and coal trade, and has reſided always at Shields. About three years ago, he was in the Northumberland life boat, which was preſented to North Shields by the duke of Northumberland, the firſt time ſhe went off, which was to the relief of the ſloop Edinburgh. This veſſel was ſeen to go upon the Herd ſands, about a mile and a half from ſhore; ſhe was brought to an anchor before the life-boat got to her, and ſhe continued ſtriking the ground ſo heavily, that ſhe would not have held together ten minutes longer, had they not got to her; they made her cut her cable, and then took ſeven men out of her, and brought them on ſhore. The ſea at that time was monſtrouſly high, ſo high that no other boat whatever could have lived in it.

"He was then aſked, whether he had been out in the life-boat on any other occaſion? to which he replied, that he had been five times out in her to the relief of different ſhips; from one ſhip they ſaved fifteen men; and in every inſtance when he, the witneſs, was in the boat, they ſaved the whole of the crews of the wrecked ſhips. Beſides the times he has been himſelf in the boat, he has ſeen her go off ſcores of times, and never ſaw her fail in bringing off ſuch of the crews as ſtayed by the ſhips. But many times part of the crews of the veſſel wrecked have taken to their own boats, and

and have been drowned by the boats' upſetting; whilſt the remainder of the crews that continued on board have been ſaved by the life-boat. And the witneſs declared his conviction, that no other boat that ever he ſaw could have gone from the ſhore and ſaved the crews, at the times the life-boat went.

"He ſtated that in the event of the life-boat filling with water, ſhe would continue ſtill upright, and would not founder, as boats of a common conſtruction do. That about two months ago, he ſaw her come on ſhore with a ſhip's crew, beſides her own crew, ſo full of water that it ran over each ſide; the ſea had broken ſeveral of her oars; and he believes, that no boat of any other conſtruction could have brought the crew on ſhore ſo filled with water.

"Captain William Carter, of the ſhip Providence of Newcaſtle, ſtated, that he had reſided at South Shields twenty-five years, and been fifteen years in the coal and Baltic trades; that on the 28th of November 1797, he commanded the Velocity of 59 tons, riding at anchor on Tynemouth bar, amongſt the broken water, when the ſhip Planter was driven on ſhore by the violence of the gale, about one hundred yards from the Velocity; the life-boat came off and took fifteen perſons out of the Planter; and they had ſcarcely quitted the ſhip when ſhe went to pieces; they muſt all otherwiſe have inevitably periſhed, as the wreck came on ſhore almoſt as ſoon as the life-boat. He conceived that no boat of a common conſtruction could have given relief at that time. There were ſeveral other veſſels in the ſame ſituation with the Planter, namely, the Gateſhead, the Mary, and the Beaver, beſides a ſloop, whoſe name the witneſs does not know. The crew of the Gateſhead, being nine in number, took to their own boat, which ſunk, and ſeven of them were loſt; the other two ſaved themſelves by ropes thrown from the Mary. After the life-boat had landed the crew of the Planter, ſhe went off ſucceſſively to the other veſſels, and brought the whole of their crews ſafe on ſhore, together with the two perſons who had eſcaped from the boat of the Gateſhead. He has ſeen the life-boat go to the aſſiſtance of other veſſels at different times, and ſhe always ſucceeded in bringing the crews on ſhore.

"The witneſs has ſeveral times obſerved her to come on ſhore full of water and always ſafe.

"Captain Gilfred Lawſon Reed, an elder brother of the Trinity-houſe, ſtated, that he had been bred to the ſea, and had been a member of the Trinity-houſe ſeventeen years. He had the management of the life-boat at Loweſtoffe, particularly laſt year, where he was requeſted by the ſubſcribers to make any improvement he thought neceſſary. She was built exactly upon Mr. Greathead's plan, correſponding with the model before the committee. Having fitted her for ſervice as far as he thought proper, he was requeſted by a number of the ſubſcribers to launch this life-boat; he took an opportunity, when the ſea fell very heavy on the beach, and launched her in the preſence of at leaſt two hundred ſpectators. Twenty-four men jumped into her; and when ſhe firſt mounted the waves, the ſpectators with one voice expreſſed their aſtoniſhment. He had given the men orders to croſs a ſhoal, that lay about a mile and a half from the ſhore upon which the ſea broke very heavily: by ſome miſtake one of the plugs was left out of the bottom, and ſhe filled with water before ſhe got to the ſhoal, which obliged the men to return immediately, and ſhe brought the twenty-four men ſafe to ſhore, though when ſhe gained the ſhore, ſhe was full of water to the gun wale and midſhips; yet by her ſheer one-third of her at each end was out of the water.

"Being aſked, wherein he conſidered the ſuperiority of the life-boat conſiſts over any other boat that has hitherto been invented? he anſwered, the curvature of the keel, and the flaunching ſides, which render it almoſt impoſſible to be upſet. When this boat was afloat and full of water, the men all went to one ſide of the boat, in order to try the poſſibility of upſetting her, which they could not effect.

"Mr. Thomas Henderwell, of Scarborough, ſhip-owner, ſtated, that the peculiar nature of the curvature of the keel of this boat is the foundation and baſis of its excellence. It regulates, in a great meaſure, the ſheer with elevation towards the ends. This conſtruction ſpreads and repels the water in every direction, and enables her to aſcend and deſcend with great facility over the breakers. The ends being reduced regularly from the centre to leſs than one-third proportion of the midſhips, both ends are lighter than the body ſection. By means of the curved keel, and the centre of gravity being placed in the centre of the boat, ſhe preſerves equilibrium in the midſt of the breakers. The internal ſhallowneſs of the boat in the body ſection, occaſioned by the convexity of the keel and the ſheer at the top, leaves ſo ſmall a ſpace for the water to occupy, that the boat, though filled with water, is in no danger of ſinking or upſetting. The buoyancy of the boat, when filled with water, is alſo aſſiſted by the cork being placed above the water-line.

"Mr. Samuel Plumb, of Lower Shadwell, deſcribed himſelf to have been bred to the ſea, and to have acted in the capacity of maſter of a ſhip from 1777 until within theſe eighteen months; that he had been chiefly employed in the coal and Baltic trades, and had reſided at Shields the whole of his life till within the laſt five years. He is acquainted with the Shields' life-boats; and from every information he had received, Mr. Greathead has been univerſally conſidered as the inventor of them.

"He went out in one of them to the relief of a ſhip, which was wrecked on the coaſt near the mouth of the Tyne. The firſt time they reached the wreck, the rope, which they threw from the wreck to the life-boat, broke, and the boat was drifted to the northward by the violence of the wind and ſtrong current of the tide; they then landed, and by two horſes dragged the boat along the ſand to the ſouthward, and then launched her again through the breakers to the veſſel. In the ſecond attempt they ſucceeded in bringing the crew on ſhore. The witneſs never ſaw any other boat in which he would have ventured to the relief of the crew, or which he thinks could have executed the purpoſe of ſaving them.

"Mr. William Maſterman of South Shields, ſhip-owner, was one of the original committee that ordered the life-boat at South Shields in 1789. He corroborated the evidence given by captain William Carter; and ſtated, that from the ſituation of his reſidence, he has ſeen the performance of the life-boat more frequently than probably any other of the committee at South Shields, and has frequently ſeen and aſſiſted in the launching of the life-boat from the beach into the ſea during a ſtorm. That this is done with the aſſiſtance of low wheels, or what may be called rollers, upon which ſhe is dragged to the water's edge, and by means of hands proportioned to the weight of the boat, ſhe can be launched with as much eaſe as any other boat. He remembers the inſtance ſtated by Mr. Samuel Plumb, in which the life boat, being drifted to the northward by a ſtrong tide, was landed, and again launched to the ſouthward oppoſite to the wreck, and in the face of a very heavy ſea. When the Gateſhead, Planter, and other ſhips were wrecked, it was firſt diſcovered that the life-boat could act with perfect ſafety *athwart the ſea*; and ſince that time, the boat has been rowed *athwart ſea*, or otherwiſe, indifferently,

as the object to be relieved required it; and that she goes with the same safety from one object to another, in a broken sea, as an ordinary boat would pass from one ship to another in a smooth sea. He is confident, since the establishment of the life-boat, that there have been at least 300 persons brought on shore from ships in distress, and wrecks off Shields, the greatest part of whom must otherwise have perished. And the witness added, that it was his opinion, founded upon experience and the observations he had been enabled to make, that no sea, however high, could overset or sink the life-boat."

The *originality* of Mr. Greathead's invention is there proved by proper certificates and attestations; and the remuneration that he had received over and above a profit of from ten to fifteen pounds each, upon building a few boats, is stated to be,

From the Literary and Philosophical Society of Newcastle, five guineas.

Royal Humane Society, a medallion.

Corporation of the Trinity House, 100 guineas.

Society of Arts, a gold medallion and 50 guineas.

The vote of parliament, on the 3d of June, in consequence of the foregoing report, was, "That a sum not exceeding 1200 pounds be granted to his majesty, to be paid to Henry Greathead, of South Shields, in the county of Durham, boat builder, as a reward for his invention of the life-boat, whereby many lives have already been saved, and great security is afforded to seamen and property in cases of shipwreck."

The subscribers at Lloyd's, on the 20th of May, voted to Mr. Greathead the sum of 100 guineas, "as an acknowledgement of his talents and exertions in inventing and building a life-boat," and 2000 pounds "for the purpose of encouraging the building of life-boats on different parts of the coasts of these kingdoms."

At the beginning of 1804, Mr. Greathead received a very valuable diamond ring from the emperor of Russia, whose munificence to ingenious men of all countries is well known.

The following extract from the Tyne Mercury of the 29th November 1803, is another proof of the great utility of the life-boat.

The Bee of Shields, John Houlton master, having put to sea (21st Nov.) in an easterly wind, had not proceeded far, when it began to blow strong from the south-east, which obliged him a few hours after to put back. In taking Tynemouth bar at the last quarter ebb, in a very heavy sea, she struck the ground, and unshipped her rudder. Being now completely unmanageable, she drifted towards the north side of the bar, and at length drove on the Black Middens. They who have witnessed the tremendous sea which breaks on the north-east part of this harbour, in a south-easterly wind, may form a conception of the dreadful situation in which the crew of the vessel were situated. In the midst of rocks, where the sea runs mountains high, so as frequently to obscure the ship, and where any vessel might be expected immediately to go to pieces; their only refuge from being swept into the gulf, was to climb up into the shrouds, which the captain, with six men and boys, being the whole crew, instantly effected. The dangerous situation in which they were placed, immediately attracted an immense number of spectators from both North and South Shields. The shores in every direction were lined with people who expressed, by their anxious looks, the most sympathetic apprehensions for their safety. The making use of the life-boat was by most people thought impossible; and at all events, the attempt was attended with extreme danger, owing to the tremendous sea, and the immense rocks which lay where the vessel was stranded. So confident, however, was Mr. Greathead, the inventor, of the life-boat being able to live in any sea, if properly navigated, that he, without hesitation, and with the greatest alertness, volunteered his services to bring off the men from the brig. This intrepid offer operated like electricity among the sailors; and immediately the Northumberland life-boat was launched, and manned with Mr. Greathead and South Shields pilots. In the course of a few minutes they reached the vessel, without much difficulty, and picked off the men from the shrouds shivering with cold, and almost perished by fatigue. One man, in making too much haste to enter the boat, fell into the breakers, but was immediately recovered. When the whole crew was in the boat, they rowed towards the shore, and in less than an hour from the time the boat was launched, did they return in safety to South Shields, without a single accident!

Upon the 1st of August 1777, some trials were made on a boat, or sloop fit for inland navigation, coasting voyages, and short passages by sea, which is not, like ordinary vessels, liable to be overset or sunk by winds, waves, water-spouts, or too heavy a load, contrived and constructed by Monsieur Bernieres, director of the bridges and causeways in France, &c. at the gate of the invalids in Paris, in the presence of the provost of the merchants, of the body of the town, and of a numerous concourse of spectators of all conditions.

These experiments were made in the way of comparison with another common boat of the same place, and of equal size. Both boats had been built ten years, and their exterior forms appeared to be exactly similar. The common boat contained only eight men, who rocked it and made it incline so much to one side, that it presently filled with water, and sunk; so that the men were obliged to save themselves by swimming; a thing common in all vessels of the same kind, either from the imprudence of those who are in them, the strength of the waves or wind, a violent or unexpected shock, their being overloaded, or overpowered any other way.

The same men who had just escaped the boat which sunk, got into the boat of M. Bernieres; rocked and filled it, as they had done the other, with water. But, instead of sinking to the bottom, though brim-full, it bore being rowed about the river, loaded as it was with men and water, without any danger to the people in it.

M. Bernieres carried the trial still farther. He ordered a mast to be erected in this same boat, when filled with water; and to the top of the mast had a rope fastened, and drawn till the end of the mast touched the surface of the river, so that the boat was entirely on one side, a position into which neither winds nor waves could bring her; yet, as soon as the men, who had hauled her into this situation, let go the rope the boat and mast recovered themselves perfectly in less than the quarter of a second; a convincing proof that the boat could neither be sunk nor overturned, and that it afforded the greatest possible security in every way. These experiments appeared to give the greater pleasure to the public, as the advantages of the discovery are not only so sensible, but of the first importance to mankind

Marnois boats, so called from being employed on the river Marne in France. They are flat, and carry wine, corn, timber, &c. from the province of Champaigne.

Norway boat, or yawl, is sharp at both ends, and of various dimensions. This boat, from its construction, is admirably adapted for enduring a high sea, and will often ven-

ture out to a great diſtance from the land, when ſome ſhips can ſcarcely carry any ſail.

Pahie, a boat of the Society iſlands; it is bow-ſided, and ſharp-bottomed. The pahie, according to captain Cook, is of different ſizes, from thirty to ſixty feet long, but like the ivahah, is very narrow. One that was meaſured was fifty-one feet long, and only one foot and an half wide at the top; in the wideſt part it was about three-feet, and this is the general proportion. It does not, however, widen by a gradual ſwell, but the ſides being ſtraight and parallel for a little way below the gunwale, it ſwells abruptly, and draws to a ridge in the bottom; ſo that a tranſverſe ſection of it has ſomewhat the appearance of the mark upon cards, called a ſpade, the whole being much wider in proportion to its length. Theſe, like the largeſt ivahahs, are uſed for fighting, but principally for long voyages. The fighting pahie, which is the largeſt, is fitted with the ſtage or platform, which is proportionably larger than thoſe of the ivahah, as their form enables them to ſuſtain a much greater weight. Thoſe that are uſed for ſailing are double, and thoſe of the middle ſize are ſaid to be the beſt ſea-boats. They are ſometimes out a month together, going from iſland to iſland, and ſometimes as is credibly reported, they are not unfrequently a fortnight or twenty days at ſea, and could keep it longer, if they had more ſtowage for proviſions, and conveniencies to hold freſh water.

When any of theſe boats carry ſail ſingle, they make uſe of a log of wood which is faſtened to the end of two poles that lie acroſs the veſſel, and project from ſix to ten feet, according to the ſize of the veſſel, beyond its ſide; ſomewhat like what is uſed by the flying proa of the Ladrone iſlands, and called, in the account of lord Anſon's voyage, an *Outrigger*; to which the ſhrouds are faſtened.

Some of them have one maſt, and others two; they are made of a ſingle ſtick; and when the length of the canoe is 30 feet, that of the maſt is ſomewhat leſs than 25 feet; it is fixed to the frame that is above the canoe, and receives a ſail of matting about one-third longer than itſelf; the ſail is pointed at the top, ſquare at the bottom, and curved at the ſide, ſomewhat reſembling what is called a ſhoulder of mutton ſail, and uſed for boats belonging to men of war; it is placed in a frame of wood, which ſurrounds it on every ſide, and has no contrivance either for reefing or furling, ſo that if either ſhould become neceſſary, it muſt be cut away, which, however, in theſe climates, can ſeldom happen. To the top of the maſt are faſtened ornaments of feathers, which are placed inclining obliquely forwards, the ſhape and poſition of which will be conceived at once from the figure in the *plate* of *Boats*.

The oars or paddles that are uſed with theſe boats, have a long handle and flat blade, not unlike a baker's peel. Of theſe, every perſon in the boat has one, except thoſe that ſit under the awning, and they puſh her forward with them at a good rate. Theſe boats, however, admit ſo much water at the ſeams, that one perſon at leaſt is continually employed in throwing it out. The only thing in which they excel is landing and putting off from the ſhore in a ſurf; by their great length, and high ſterns, they could land every day, where the Engliſh boats could ſcarcely land at all: they have alſo the ſame advantages in putting off by the height of the head.

The exact dimenſions of a pahie, given from a careful admeaſurement, will ſo very materially contribute to the elucidation of the deſcription ſubſequently given, as to the manner and particular form in which this claſs of canoes is built, that they might perhaps enable an European draughtſman, to conſtruct one ſo nearly reſembling them as to create ſome difficulty in pointing out the true from that which was fictitious:

	Feet.	Inches.
Extreme length from ſtem to ſtern, not reckoning the bending up of either -	51	0
Breadth in the clear of the top forward -	1	2
Breadth in the midſhips - - -	1	6
Breadth aft - - - - -	1	2
—In the bilge forward - - -	2	8
—In the midſhips - - -	2	11
—Aft - - - - -	2	9
Depth in the midſhips - - -	3	4
Height from the ground on which ſhe ſtood	3	6
Height of the head from the ground without, including that of the figure -	4	4
Height of the figure - - -	0	11
Height of the ſtern from the ground -	8	9
Height of the figure - -	2	0

To illuſtrate the deſcription of the manner in which theſe veſſels are built, it will be neceſſary to refer to *fig.* 2. *Plate* II.

The firſt ſtage or keel under *a a*, is formed of a tree hollowed out like a trough, for which the longeſt trees are choſen that can be procured, ſo that there are never more than three in the whole length; the next ſtage under *b b*, is formed of ſtraight planks, about four feet long, fifteen inches broad, and two inches thick; the third ſtage under *c c*, is like the bottom, made of the trunks hollowed into its bilging form; the laſt is alſo cut out of trunks, ſo that the moulding is of one piece with the upright. To form theſe parts ſeparately without ſaw, plane, chiſſel, or any other iron tool, may well be thought no eaſy taſk; but the great difficulty is to join them together.

When all the parts are prepared, the keel is laid upon the blocks; and the planks, being ſupported by ſtanchions, are ſewed or clamped together with ſtrong thongs of plaiting. Theſe are paſſed ſeveral times through holes that are bored with a gauge or auger of bone, which performs its office with tolerable exactneſs; and the nicety with which this is done, may be inferred from their being ſufficiently water-tight for uſe without caulking. As the plaiting ſoon rots in the water, it is renewed at leaſt, once a year, in order to which the veſſel is taken entirely to pieces; the head and ſtern are rude, with reſpect to the deſign, but very neatly finiſhed, and poliſhed to the higheſt degree.

Theſe pahies are kept with great care in a kind of houſe, built on purpoſe for their reception; the houſes are formed of poles ſet upright in the ground, the tops of which are drawn towards each other, and faſtened together with their ſtrongeſt cord, ſo as to form a kind of Gothic arch, which is completely thatched quite to the ground, being open only at the ends: they are ſometimes fifty or ſixty paces long.

Peter-boat, a boat employed in the river Thames in fiſhing. They in general ſail well, and are good ſea-boats.

Pleaſure-boat, a veſſel employed by gentlemen in excurſions upon the water, for their amuſement. Their ſize and manner of equipment are very various, being from a few tons burthen, to upwards of two or three hundred tons, and having one or more maſts.

Poſt-boats, are boats eſtabliſhed on the river Loire in France, for the convenience of the public. They are long in reſpect to their breadth, and go very faſt. There are alſo ſome on the Rhone, which go from Lyons to Avignon in 24 hours.

Proa; ſee that article.

Punt, a ſort of flat-bottomed boat, whoſe floor reſembles the platform of a floating ſtage. It is uſed by the naval artificers,

artificers, either in caulking, breaming, or repairing the bottom of a ship.

Sampan, a Chinese boat without a keel, appearing almost like a trough; they are made of different dimensions, but are mostly covered. There are passenger sampans, to carry people backward and forward, between the town and ships. These boats are as long as sloops, but broader, almost like a baking trough, and have, at the end, one or more decks, made of bamboo-sticks; the cover, or roof, is also made of bamboo sticks, arched over in the shape of a grater, and may be raised or lowered at pleasure; the sides are made of boards, with little holes, and shutters instead of windows; the boards are fastened on both sides to posts, which have notches like steps on the inside, that the roof may be let down, and rest on them: on both ends of the deck are commonly two little doors, at least there is one at the stern. A fine, white smooth carpet, spread up as far as the boards, makes the floor, which, in the middle, consists of loose boards; but this carpet is only made use of to sleep on. As these boats differ from those of Europeans in shape, they are likewise rowed in a different manner; for two rowers posting themselves at the back end of the sampan, work it forwards very readily by the motion of two oars, and can almost turn the vessel just as they please; the oars, which are covered with a little hollow quadrangular iron, are laid on iron swivels, which are fastened in the side of the sampan. At the iron the oars are pieced, which makes them look a little bent. In common, a rower sits before with a short oar, but this he is forced to lay aside when he comes near the city, on account of the great throng of sampans; and this inconvenience has confirmed the Chinese in their old way of rowing.

Sampans of *burden* are the largest boats, by which all porcelain, silks, and other commodities, are conveyed from Canton to the European ships. But these boats do not serve for the above-mentioned purposes only, but are used, besides, as houses for whole families, which are born, marry, and die in them. They commonly have, besides, hogs, some chickens and dogs, and some flower-pots, containing Guinea pepper, or some other plants, in these boats.

Duck sampans, are boats in which they feed four or five hundred ducks. They have on both sides a bridge, which may be let down. In the day-time the ducks feed in the river upon herbs and fish; at night their master calls them into his boat; they immediately obey him, and come on board as soon as he lets down his Bridge.

Fishing sampans, are the smallest of all, narrow, like some European fishing boats, and have either a very small deck of straw, or bamboo, or are even without that poor convenience. Bad as these boats are, yet parents, and their naked children, are seen to get their livelihood in them, both summer and winter, by fishing, and picking up what has been thrown overboard from other vessels. For this purpose they tie several hooks to a cord, and throw them out in different places; almost in the same manner as fishermen lay their eel-hooks. They have better or worse fortune, as it happens. There is nothing so filthy but what these people will use as food; and the hogs, which having died are thrown overboard, when they begin to putrefy, float in a few days, and often become the occasion of quarrels, which end in battles. The reason why the Europeans sink the hogs, which die on board their ships, is, that the inhabitants of this place may not fall upon them; for it is said that the Chinese, when they go on board any ships, will give pepper to the hogs, which they think is poison to them, that they may get them again if they should die. It is certain, that numbers of hogs die in possession of the Europeans whilst they stay in China.

Mandarin's sampans are greater or less red-painted boats, ornamented with dragons, and such like figures, or with little flags.

The *Stage-boats*, called in French, bateaux coches, and more commonly coches-d'eau, water coaches, are large covered vessels, which serve, particularly on the river Seine, for the conveniency of travellers, and for carrying all sorts of merchandizes. The names of them are the passage boat, or water coach of Sens, of Auxerre, of Montereau, and of Fontainbleau, or Valvin.

Tilt-boat, one with a cover, to defend the passengers from rain, &c.

Tract-boat, a boat employed in a canal in conveying passengers, &c. from one place to another. This mode of travelling, though not expeditious, is indeed very pleasant, and certainly much cheaper than by any land carriage. From Grangemouth to Port Dundas, a distance of nearly 30 miles, the fare is only one shilling, or eighteen pence.

Well-boat, a boat having a well in the bottom, to preserve fish alive.

A *Wherry* is a light sharp boat, used in a river or harbour, for carrying passengers from place to place.

The boats, or wherries, allowed to ply on the Thames about London, are either *skullers*, wrought by a single person with two oars; or *oars*, wrought by two or more persons, with each an oar.

The following are some of the terms used in the management of a boat.

Bale the boat, is to throw out the water which remains in her bottom, or the well-room. See BAILE.

Fend the boat, to save her from beating against the ship's sides.

Man the boat, an order to those appointed to manage her to go on board the boat immediately.

Moor the boat, the order to fasten a boat with two ropes, so as that the one shall counteract the other.

Trim the boat, the order to sit in the boat in such a manner as that she shall float upright in the water, without leaning to either side.

Wind the boat, the order to bring her head the other way.

The *boat's gang*, includes those who are employed for rowing in the boat; such as the cockswain and his gang, to whom the charge of the boat immediately belongs.

A *bold boat* is that which will endure a rough sea well.

To preserve boats from foundering at sea when ships founder. Take any mast, yard, boom, &c. that may be found floating from the ship; the longer the better; make fast to each end of the boom a rope about twice its length; and bend one end of another rope, about ten fathoms long, exactly in the middle of the span, and the other end is to be made fast to the forepart of the boat, so that she may drive stem on to the sea. When this misfortune happens far from land, and the storm ceases, in moderate weather the drift boom may be towed end on to the boat's stern, that they may either row or sail towards land.

Mr. Hutchinson, in his treatise on practical seamanship, gives an account of a boat being preserved by this method, as follows. The Basil, in her passage from the West Indies, took up ten men in a small boat, twelve feet long, which was preserved from foundering after the vessel had foundered, by having a rope fast to a log of wood, as they called it, and tied to the boat's bow, which kept her to drive end on with the head to the waves, and broke their violence so much as to preserve her from filling with water, when one half of them was obliged to lie down in the bottom of the boat, to prevent her being top-heavy. By particular inquiry of the master

master and mate of the Basil, Mr. Hutchinson was informed, that those people belonged to a schooner bound from Bermudas to the West Indies; that it was after a hard gale of wind when they met with the boat, which had two oars for masts, and two blankets set upon them for sails, and was steering for Bermudas, when they were fortunately taken up; and that the log of wood, as it was called, they drove by, was their fore square sail yard, spanned with a rope to each yard-arm, and a rope about ten or twelve fathoms long beat to the middle of the span, and made fast to the boat's bow, to drive by. The mate of the schooner told the master of the Basil, that they had been saved in this manner in a boat once before, by driving to leeward of a mast, in a hurricane in the West Indies.

In order to account for this wonderful effect of the drift-boom, in preventing the broken water from swamping the boat, it may be observed, says Mr. Hutchinson, that waves never break till their tops are forced forwards by their great velocity beyond the perpendicular of their base; then that water falls down forward, and incloses and compresses a quantity of air, which, by the power of its elasticity, blows this fore part of the waves to pieces, forwards and upwards, in an oblique direction, and makes it appear like froth. They then have no buoyant power to lift a boat; but when they are high, they fill and sink her. And they break more in shoal water than in deep, in proportion as their bottoms or base are more obstructed in their velocity by the ground than their tops; hence, in very shoal water, they are continually breaking, so that they make nothing but what is called broken water, by which shoals may be seen and known at a great distance in clear weather.

If we endeavour to account for the wonderful effect of so small and simple a machine, to preserve such a small boat, deeply laden as she must be with ten men, from being filled with water in such a storm; in our opinion it is owing to the boat driving end on by the drift boom, that keeps it always swimming on the surface, broadside to the wind; and the waves that are running towards it, within the length of the drift boom, must certainly obstruct the velocity of the upper part of these waves, so as to lessen their increase in height, and prevent the top from running beyond the perpendicular of the base, or bottom of these waves, that occasions their breaking, as has been described, but spend themselves without breaking. These reasons we hope will be thought sufficient to recommend this method to be tried and brought into practice on such dreadful occasions: and we cannot help thinking, that the same method should be tried, when under the dreadful necessity of saving lives by boats landing on a lee shore in a storm, where broken waves run high. The only difference we would recommend in the management, is to proceed with the boat's stern to the drift boom, and her head to the shore, to be ready to row and steer for the best apparent landing-place; and if it is a long flat shore, as soon as the boat strikes the ground, cut or slip the drift boom rope, that it may not haul the boat off the shore again by the back sweep of the waves.

Upon landing a boat in a surf. Before the boat comes near the shore, pour a little oil on the water, which will prevent its breaking, and greatly allay the swell, so that the boat may approach the shore without the dread of being swallowed up in the breakers.

M. Danzel has lately invented an hydraulic machine for making a ship or boat advance during a calm, and even against a current.

The mechanism of this machine is very simple; it consists of a long pole, to the anterior extremity of which an apparatus, shaped like a drawer without back or front, is attached in such a manner, that when pushed forwards it folds itself back under the pole, to which it (as it were) adheres, and presents to the water the thin cutting surface of its three edges, viz. of the bottom and two sides, which can neither oppose to the water a resistance capable of preventing the pole from penetrating farther, or of making the ship recede. When the pole, which is pushed forwards from the vessel, has attained to its full reach, the drawer, as soon as the pole is pushed back, assumes a vertical position, and presents to the water its whole cavity. By these means it embraces a column of water, which, without finding means to escape, presses on a surface much larger than that of a common oar, and keeps the drawer immoveable; so that those who draw the pole towards them, instead of making the vessel to recede, cause it to advance. This machine, which may be multiplied more conveniently than oars, has this visible advantage over the latter, that it opposes to the water a resistance infinitely superior, while the passive re-action of this resistance renders the labour of the mariners less laborious and more effectual.

De Chales proposes the construction of a boat, which, what burden soever it bear, shall not only move against the current, without either sails or oars, but also advance so much the faster, as the rapidity of the water is greater. Its make is the same with that of the others, excepting only a wheel added to its side, with a cord, which winds round a roller as fast as the wheel turns.

Something of the like kind has also been since done by M. Pitot. Vide Mem. Acad. R. Scienc. an. 1729. p. 359, and p. 540.

M. de la Hire has given us an examination of the force necessary to move boats, both in stagnant and running water, either with ropes fastened to them, or with oars, or with any other machine; wherein he shews, that the larger the surface of the oars plunged in the water, and the smaller that of the boat presented to the water, is; and again, the longer that part of the oar between the hand and the places where the oar rests on the boat, and the shorter that between this last point and the water; the freer will the boat move, and the greater effect will the oar have. See Oar.

Hence it is easy to calculate the force of any machine that shall be applied to rowing; v. gr. if we know the absolute force of all the men who row, it must be changed into a relative force, according to the proportion of the two parts of the oar; i.e. if the part out of the vessel be double the other, and all the men together can act with the force of 900 pounds, we compute first, that they will exert 300; which 300, multiplied by the surface which the vessel presents to the water, gives a solid water of a certain weight; which weight may be found, and of consequence the velocity impressed on the vessel by the oars. Or, the velocity of the oars may be found in the same manner, by multiplying the 300 pounds by the surface of all the parts of the oars plunged in the water. Nor would there be any difficulty in finding first the relative forces, then the absolute ones; the velocities either of the oars, or of the vessel being given, or the proportion of the two parts of the oar.

Boats sail more slowly and heavily over shallow than over deep waters. See an account of experiments for explaining this, in Dr. Franklin's Letter to Sir John Pringle. Experiments, &c. 4to. 5th ed. p. 510.

Boats, *Construction of.* In order to illustrate this by an example, let it be required to lay down the several plans of a long boat, the extreme length being 31 feet, and breadth moulded 9 feet.

Draw the ſtraight line PO, *fig.* 1. *Plate* I. (*Ship-building*) equal to 31 feet, the extreme length of the boat, and alſo to repreſent the upper edge of the keel. Let ⊕ be the ſtation of the midſhip frame. From the points P, ⊕, and O, draw the lines PT, ⊕M, and OS, perpendicular to PO. Make ⊕M, ⊕N, equal to the upper and lower heights of breadth reſpectively at the main frame, PT, the height of breadth at the tranſom, and OS, the height at the ſtern. Deſcribe the curve TMS, to repreſent the ſheer, or extreme height of the ſide, which, in a ſhip, would be called either the upper height of breadth line, or the upper edge of the wale. Through the point N draw a curve parallel to TMS, to repreſent the breadth of the upper ſtrake of a boat, or lower edge of the wale if in a ſhip. The dotted line TNS may alſo be drawn to repreſent the lower height of breadth.

Set off the rake of the poſt from P to *p*, and draw the line *pt*, to repreſent the aft ſide of the poſt; then T*t* will repreſent the round up of the tranſom. Set off the breadth of the poſt from *p* to *r*, and from T to *s*, and draw the line *rs* to repreſent the foreſide of the poſt, which may either be a curve or a ſtraight line at pleaſure. Set up the height of the tuck from *p* to *k*. Let *kx* be the thickneſs of the tranſom, and draw the line Z *x* to repreſent the foreſide of the tranſom.

There is given the point S the height of the ſheer on the foreſide of the ſtem; now that ſide of the ſtem is to be formed either by ſweeps, or ſome other contrivance. Set off the breadth of the ſtem, and form the aft ſide of it.

Set up the dead-riſing from ⊕ to *d*, and form the riſing line *ris*. Draw the line KL parallel to PO, to repreſent the lower edge of the keel, and another to repreſent the thickneſs of the plank or the rabbet. The rabbet on the poſt and ſtem may alſo be repreſented; and the ſtations of the timbers aſſigned, as ⊕, (1), 1, 2, 3, 4, 5, 6, 7, 8, 9; and ⊕, (A), A, B, C, D, E, F, G, H; and the ſheer plan will be completed.

The half-breadth plan is to be formed next; for this purpoſe the perpendiculars TP, 9, 8, &c. muſt be produced. Upon M⊕ produced ſet off the half-breadth from the line KL to R (*fig.* 2.); ſet off alſo the half-breadth at the tranſom from K to *b*, and deſcribe the extreme half-breadth line *b*RX, making the fore part of the curve agreeable to the propoſed round of the harpin.

We may next proceed to form the timbers in the body plan. Let AB (*fig.* 3.) be the breadth moulded at ⊕. Erect the perpendicular CD in the middle of the line AB, draw the line *nm* diſtant therefrom the half thickneſs of the poſt, and *xy* the half thickneſs of the ſtem. Then take off the ſeveral portions of the perpendiculars ⊕. 1, 2, &c. intercepted between the upper edge of the keel and the riſing line in the ſheer plan, and ſet them up from C upon the line CD; through theſe points draw lines parallel to AC; take off alſo the ſeveral lower heights of the breadth at ⊕, 1, 2, &c. from the ſheer plan, and ſet them up from C upon the middle line in the body plan; and draw lines parallel to AC through theſe points; then take off the ſeveral half-breadths correſponding to each from the floor plan; and ſet them off on their proper half-breadth lines, from the middle line in the body plan.

Conſtruct the midſhip frame according to the directions mentioned in that article, the form of which will in ſome meaſure determine the form of the reſt. For if a mould be made on any ſide of the middle line to fit the curve part of it, and the riſing line, or that marked *bend mould*, (*fig.* 4.) and laid in ſuch a manner that the lower part of it, which is ſtraight, may be upon the ſeveral riſing lines, and the upper part juſt touch the point of the half-breadth in the breadth line correſponding to that riſing upon which the mould is placed, a curve may then be drawn by the mould to the riſing line. In this manner we may proceed ſo far as the riſing line is parallel to the lower height of the breadth line. Then a hollow mould muſt be made, the upper end of which is left ſtraight, as that marked *hollow mould* (*fig.* 4). This is applied in ſuch a manner, that ſome part of the hollow may touch the ſide of the keel, and the ſtraight part touch the back of the curve before deſcribed by the bend mould; and beginning abaft, the ſtraight part will always come lower on every timber, till we arrive at the midſhip timber, when it comes to the ſide of the keel. Having thus formed the timbers, as far as the whole mouldings will ſerve, the timbers abaft them are next formed. Their half-breadths are determined by the ſheer and floor plans, which are the only fixed points through which the curves of theſe timbers muſt paſs. Some form theſe after timbers before the whole is moulded, and then make the hollow mould, which will be ſtraighter than the hollow of either of theſe timbers. It is indifferent which are firſt formed, or what methods are uſed: for after the timbers are all formed, though every timber may appear very fair when conſidered by itſelf, it is uncertain what the form of the ſide will be. In order to find which, we muſt form ſeveral ribband and water lines; and if theſe do not make fair curves, they muſt be rectified, and the timbers formed from theſe ribband and water lines. In uſing the hollow mould when it is applied to the curve of each timber, if the ſtraight part is produced to the middle line, we ſhall have as many points of interſection as there are timbers; and if the heights above the baſe be transferred to the correſponding timbers in the ſheer plan, a curve paſſing through theſe points is called a *riſing ſtrait*. This may be formed by fixing a point for the aftermoſt timber that is whole moulded, and transferring that height to the ſheer plan. The curve muſt paſs through this point, and fall in with the riſing line ſomewhere abaft dead-flat; and if the ſeveral heights of this line be transferred from the ſheer to the middle line in the body plan, theſe points will regulate what is called the *hauling down* of the hollow mould.

The timbers in the after-body being all formed, thoſe in the fore-body are formed in the ſame manner, by transferring the ſeveral heights of the riſing and breadth lines from the ſheer to the body plan; the half-breadth correſponding to each height muſt alſo be transferred from the floor to the body plan. The ſame hollow mould will ſerve both for the fore and after-body; and the level lines, by which the water lines to prove the after-body were formed, may be produced into the fore-body, and by theſe the water lines to prove the fore-body may be deſcribed.

Another method of proving the body is by ribband lines, which are formed by ſections of planes inclined to the ſheer plan, and interſecting the body plan diagonally, as before obſerved, of which there may be as many as may be judged neceſſary. In this, four ribband lines are laid down, marked *diag.* which are drawn in ſuch a manner as to be perpendicular to as many timbers as conveniently may be. After they are drawn in the body plan, the ſeveral portions of the diagonal, intercepted between the middle line and each timber, muſt be transferred to the floor plan. Thus, fix one foot of the compaſs in the point where the diagonal interſects the middle line in the body plan, extend the other foot to the point where the diagonal interſects the timber, for example, timber 9. Set off the ſame extent upon the perpendicular repreſenting the plane of timber 9, from the point where it interſects the line KL, on the floor plan; in like manner proceed

with

with all the other timbers, both in the fore and after-body, and we ſhall have the points through which the curve muſt paſs. If this ſhould not prove a fair curve, it muſt be altered, obſerving to conform to the points, as nearly as the nature of the curve will admit; and, therefore, it may be carried within one point and without another, according as the timbers will allow. For after all the ribband lines are formed, the timbers muſt, if neceſſary, be altered by the ribband lines; this is only the reverſe of forming theſe lines; for taking the portions of the ſeveral perpendiculars intercepted between the line KL, and the curve of the ribband line in the floor plan, and ſetting them off upon the diagonal, from the point where it interſects the middle line, we ſhall have the points in the diagonal through which the curves of the timbers muſt paſs. Thus, the diſtance between the line KL, and the ribband at timber 3, on the floor plan, when transferred to the body plan, will extend on the diagonal from the middle line to the point where the curve of timber 3 interſects that diagonal. The like may be ſaid of all the other timbers; and if ſeveral ribband lines be formed, they may be ſo contrived that their diagonals in the body plan ſhall be at ſuch diſtances, that a point for every timber being given in each diagonal, will be ſufficient to determine the form of all the timbers.

In ſtationing the timbers upon the keel, for a boat, there muſt be room for two futtocks in the ſpace before, or abaft ⊕; for which reaſon the diſtance between theſe two timbers will be as much more than that between the other, as the timber is broad. Here it is between ⊕ and (A), which contains the diſtances between ⊕ and (1), and the breadth of the timber beſides.

The timbers being now formed, and proved by ribband and water lines, proceed then to form the tranſom, faſhion-pieces, &c.; ſee theſe articles.

This method of whole moulding will not anſwer for the long timbers afore and abaft. They are generally canted in the ſame manner as thoſe for a ſhip. In order to render this method more complete, we ſhall here deſcribe the manner of moulding the timbers after they are laid down in the mould loft, by a *riſing ſquare*, *bend*, and *hollow mould*.

It was ſhewn before how to form the timbers by the bend and hollow moulds in the draught. The ſame method muſt be uſed in the loft; but the moulds muſt be made to their proper ſcantlings in real feet and inches. Now, when they are ſet, as before directed, for moulding each timber, let the middle line in the body plan be drawn acroſs the bend mould, and draw a line acroſs the hollow mould at the point where it touches the upper edge of the keel; and let them be marked with the proper name of the timber, as in *fig.* 4. The graduations of the bend mould will therefore be exactly the ſame as the narrowing of the breadth: Thus, the diſtance between ⊕ and 7 on the bend mould is equal to the difference between the half breadth of timber 7 and that of ⊕. The height of the head of each timber is likewiſe marked on the bend mould, and alſo the floor and breadth firmarks. The floor firmark is in that point where a ſtraight edged batten touches the back of the bend mould, the batten being ſo placed as to touch the lower edge of the keel at the ſame time. The ſeveral riſings of the floor, and heights of the cutting-down line are marked on the riſing ſquare; and the half-breadth of the keel ſet off from the ſide of it.

The moulds being thus prepared, we ſhall apply them to mould timber 7. The timber being firſt properly ſided to its breadth, lay the bend mould upon it, ſo as may beſt anſwer the round according to the grain of the wood; then lay the riſing ſquare to the bottom of the bend mould, ſo that the line drawn acroſs the bend mould at timber 7 may coincide with the line repreſenting the middle of the keel upon the riſing ſquare; and draw a line upon the timber by the ſide of the ſquare; or let the line be ſcored or cut by a tool made for that purpoſe, called a *raſeing knife*; this line ſo raſed will be the ſide of the keel. Then the ſquare muſt be moved till the ſide of it comes to 7 on the bend mould, and another line muſt be raſed in by the ſide of it, to repreſent the middle of the keel. The other ſide of the keel muſt likewiſe be raſed after the ſame manner, and the point 7 on the riſing ſquare be worked on each ſide of the keel, and a line raſed acroſs at theſe points to repreſent the upper edge of the keel. From this line the height of the cutting down line at 7 muſt be ſet up, and then the riſing ſquare may be taken away, and the timber may be raſed by the bend mould, both inſide and outſide, from the head to the floor firmark; or it may be carried lower if neceſſary. After the firmarks and heads of the timbers are marked, the bend mould may likewiſe be taken away; and then the hollow mould applied to the back of the ſweep in ſuch a manner, that the point 7 upon it may interſect the upper ſide of the keel, before ſet off by the riſing ſquare; and, when in this poſition, the timber may be raſed by it, which will complete the outſide of the timbers. The inſide of the timbers may likewiſe be formed by the hollow mould. The ſcantling at the keel is given by the cutting down before ſet off. The mould muſt be ſo placed as to touch the ſweep of the inſide of the timber formed before by the bend mould, and paſs through the cutting down point.

The uſe of the firmarks is to find the true places of the futtocks; for, as they are cut off three or four inches ſhort of the keel, they muſt be ſo placed that the futtock and floor firmarks may be compared and coincide. Notwithſtanding which, if the timbers are not very carefully trimmed, the head of the futtock may be either within or without its proper half breadth, to prevent which a half breadth ſtaff is made uſe of.

The half breadth ſtaff may be one inch ſquare, and of any convenient length. Upon one ſide of it are ſet off, from one-end, the ſeveral half breadths of all the timbers in the after-body; and thoſe of the fore-body, upon the oppoſite ſide. On the other two ſides are ſet off the ſeveral heights of the ſheer; the after-body on one ſide, and the fore-body on its oppoſite. Two ſides of the ſtaff are marked *half-breadths*, and the other two ſides *heights of the ſheer*.

The ſtaff being thus prepared, and the floor timbers faſtned on the keel and levelled acroſs, the futtocks muſt next be faſtened to the floor timbers; but they muſt be ſet firſt to their proper half breadth and height. The half breadth ſtaff, with the aſſiſtance of the ram-line, ſerves to ſet them to the half breadth; for as the keel of a boat is generally perpendicular to the horizon, therefore the line, at which the plummet is ſuſpended, and which is moveable on the ram-line, will be perpendicular to the keel, whence we may by it ſet the timbers perpendicular to the keel, and then ſet them to their proper half breadths by the ſtaff; and when the two firmarks coincide, the futtock will be at its proper height, and may be nailed to the floor timbers, and alſo to the breadth ribband; which may be ſet to the height of the ſheer, by a level laid acroſs, taking the height of the ſheer by the ſtaff, from the upper ſide of the keel; by which means we ſhall diſcover if the ribband is exactly the height of the ſheer; and if not, the true height may be ſet off by a pair of compaſſes from the level, and marked on the timbers.

Juvenal (ſat. xv. v. 126—128,) deſcribes the boats of the ancient Egyptians, as if they were earthen-ware; and it is alleged, that ſuch earthen-ware ſhips were uſed on the Nile, and that they were called "pictæ," painted, becauſe theſe boats

boats of baked earth were marked with various colours. However, it is much more probable, that the Egyptians formerly, as they have done in more modern times, made use of rafts, which were made to float by empty vessels of earthen-ware fastened under them. The word "pictæ," it is suggested, does not denote their being beautified with a variety of colours, but means their being rubbed with some substance that might fill up the pores, so as to prevent the water's penetrating into the cavity of the pitchers, and causing them to sink, for the Egyptian earthen-ware is said to be very porous. These floats, however, were not constructed to pass up and down the Nile like boats, or properly designed for carrying goods upon them, but it is an easy mode of conveying their earthen-ware from Upper Egypt, where it is manufactured, to the lower parts of that country, where, when they reach the destined place, the float is taken to pieces, and sold to the inhabitants. Harmer's Observations, vol. iii. p. 56.

Boat-*hook*, an iron hook with a sharp point, having a socket in which a long pole is stuck. This is a very necessary appendage to a boat, as by means of it, any thing floating past may be hooked; the boat may be held on to the ship, or pushed along, &c.

Boat-*steerer*. In the whale fishery a person is appointed to each boat, whose express duty is to steer the boat towards the fish, &c.

Boats, *bridge of*. See the article Bridge.

Boat, *removed with steam*. An experiment was lately tried on the canal between Grangemouth and Glasgow, to make a large boat or lighter move by the power of steam. As, it is presumed, the series of experiments is not yet completed, the reader is, therefore, referred to the article Steam.

Boat *swain*, the officer who has the care of the boats, sails, rigging, colours, anchors, and cables committed to him, which he receives by indenture from the surveyor of the navy, and is enjoined to use great care in the disposition of them.

It is the duty of the boatswain particularly to direct whatever relates to the rigging of a ship, after she is equipped from a royal dock-yard. Thus, he is to observe that the masts are properly supported by their shrouds, stays, and backstays, so that each of those ropes may sustain a proportional effort when the mast is strained by the violence of the wind, or the agitation of the ship. He ought also to take care that the blocks and running-ropes are regularly placed, so as to answer the purposes for which they are intended; and that the sails are properly fitted to their yards and stays, and well furled or reefed when occasion requires. It is likewise his office to summon the crew to their duty, to assist with his mates in the necessary business of the ship; and to relieve the watch when it expires. He ought frequently to examine the condition of the masts, sails, and rigging, and remove whatever may be judged unfit for service, or supply what is deficient; and he is ordered by his instructions to perform this duty with as little noise as possible.

The boatswain is not to cut up any cordage or canvas without an order in writing from the captain, and under the inspection of the master; and always to have by him a sufficient quantity of small plats for security of the cables.

He is not to sign any accounts, books, lists, or tickets, before he has thoroughly informed himself of the truth of every particular therein contained. His accounts are to be audited and vouched by the captain and master, and presented to the surveyor of the navy; and until such accounts are passed, he is not to receive any wages. If he has cause of complaint against any of the officers of the ship, with relation to the disposition of the stores under his charge, he is to represent the same to the Navy-board before they pay off the ship. Fifteen years servitude intitles a boatswain to superannuation.

The *Boatswain's Mate* has the charge of the long boat, anchors, cables, &c.; he must give an account of his store; and he is appointed to execute the sentence of a captain or court martial.

Boats, *train of*, a number of small vessels fastened to each other, ascending up the Loir in France, by sails when the wind serves, otherwise towed by men, sometimes to the number of seventy or eighty to a single rope.

Boat-*bill*, in *Ornithology*, the English name of a species of Cancroma, *cochlearia*. Brown's Illustrations. Or, more properly, at this time the English name of the *Cancroma* genus, *C. Cochlearia* being called by the modern writers the *crested boat bill*, and C. *Canciphorga*, the *white bellied boat-bill*. These are the two only species known. See Cancroma.

Boat, *scapha*, in *Surgery*, a species of bandage, used when the crown of the head and the part between that and the forehead are to be bound. It is likewise called *thelus diocleus*.

Boat-*fly*, in *Entomology*: See Notonecta.

Boat *island*, in *Geography*, a small island in the gulf of St. Lawrence, near the south coast of Labrador. N. lat. 50° 2′. W. long. 60° 55′.

Boat *Passage*, a channel into Facile harbour, in Dusky bay, New Zealand.

BOATING, a kind of punishment in use among the ancient Persians for capital offenders.

The manner of boating was thus: the person condemned to it being laid on his back in a boat, and having his hands stretched out, and tied fast on each side of it, had another boat put over him, his head being let out through a place fit for it. In this posture they fed him, forcing him to eat by thrusting sharp iron instruments into his eyes, till the worms, which were bred in the excrements he voided as he thus lay, eat out his bowels, and so caused his death, which was usually twenty days in effecting; the criminal lying all this while in most exquisite torments. On his face, placed full in the sun, they poured honey, enticing the flies and wasps to torment him. Plutarch tells us, that Mithridates, whom Artaxerxes condemned to this kind of punishment, for pretending to have killed his brother Cyrus, lived seventeen days in the utmost agony; and that, when the uppermost boat was taken off at his death, they found his flesh wholly consumed, and swarms of worms gnawing his bowels. Herodot. l. i. c. 133, 140. Plut. in vit. Artaxerxes.

BOATIUM Civitas, in *Antient Geography*, a town of Gaul, and one of the twelve cities of Novempopulania.

BOATSKIDS, in *Naval Architecture*, are long square pieces of fir, extending across the ship from the gang-boards, on which the boats, spare masts, &c. are stowed.

BOB, or Ball, in *Horology*, is the metallic weight which is attached to the lower extremity of a pendulum rod, by means of a tapped adjusting nut, at such a distance from the point of suspension as the time of a given vibration requires. (See the articles Centre of Oscillation and Pendulum.) In fixing upon a proper bob for any pendulum, two things are particularly to be attended to: the shape which is best calculated for meeting with the least resistance from the air; and the weight which is best adapted for preserving the isochronism of the vibrations with a given maintaining power. Each of these considerations has been the subject of much investigation. A sphere is a solid, the surface of which bears the least proportion to its solidity of any other, and a cube is one with great extent of surface compared to its solid contents; consequently, the former shape has

has obtained in cannon balls, intended to pafs through the air with as little obftruction as poffible, and has fometimes, for the fame reafon, been applied as a bob for a pendulum. Such a fhape is better adapted for a large bob than a fmall one; for the increafe of the furface is in proportion to the fquare of the diameter, whereas the increafe of weight or quantity of matter is as the cube. Mr. B. Martin (Mathematical Inftitutions, vol. ii. p. 417.) propofed two equal frufta of fimilar cones, to be joined together at the bafes, as a figure approximating nearly to a folid of leaft refiftance, and recommended it as that out of which the middle one of three fegments, cut longitudinally, will conftitute the beft fhape for an appended weight, to anfwer the purpofe of avoiding refiftance. Such a fection, he conceived, would difplace but a fmall quantity of air in one vibration, and the impulfes of that quantity, being made obliquely on the floping furfaces of the ends, would produce but a fmall effect. The lenticular fhape, however, compofed of two fegments of a large globe joined to the line of fection, has been generally adopted by clock-makers, probably becaufe two plates of brafs of that fhape can be eafily foldered together, and left hollow, fo as to be filled with lead, or other heavy metal, in order to obtain a due degree of weight without adding to the thicknefs, which is an advantage that brafs or copper cannot have of itfelf in any fhape. M. Ferdinand Berthoud (Effai fur l'Horlorgerie, tome ii. chap. xiii.) made fome experiments with bobs of both a fpherical and lenticular fhape, of equal weight, attached fucceffively to the fame free pendulum, from which it appeared, that, in the fame temperature, the latter continued to vibrate feconds much longer than the former before they arrived at the quiefcent ftate, which experiment was confidered as a proof that the lenticular fhape has the advantage in efcaping the effect of refiftance; it was difcovered, however, on a repetition of the experiment, with feconds and half-feconds pendulums, that the friction at the point of fufpenfion occafioned by heavy weights, particularly when vibrating in long arcs, made confiderable alterations in the refults, and proved itfelf a fecond fource of refiftance to the free motion of the pendulum.

The fecond confideration to be attended to in making the bob, as has been faid, is the weight which a given pendulum requires, with a given maintaining power. No theory is adequate to determine this defideratum of itfelf, becaufe the diminution of the maintaining power by the friction of the pivots and the ftate of the oil, the duration of the impulfe on the pallets, the nature of the efcapements in other refpects, the refiftance of the air, and at the point of fufpenfion, and particularly the nature and quantity of momentum of the pendulum, muft all enter into the calculation; and thefe are data, many of which are conftantly varying. The momentum, or whole quantity of motion of any pendulum, is the weight multiplied into the fquare of its velocity, fo that a large arc with a fmall weight, and a fmall arc with a correfponding large weight, cæteris paribus, ought to have an equal effect upon the ifochronifm of the fame pendulum; but the theory is not perfect; for firft, large circular arcs deviate confiderably from cycloidal ones, which, it has been demonftrated by Huygens and others fince, are thofe which have the ifochronal property in an uniformly denfe medium; and fecondly, they require a greater maintaining power than calculation gives: for inftance, where the arc is 10° from the point of reft, the addition to be made to the maintaining power beyond calculation is 57 parts in 100, according to Berthoud's experiments, which confideration induces him to conclude, that irregularities in the maintaining power will affect the momentum principally compofed of velocity, more than the momentum principally compofed of weight; each kind of momentum, however, has its peculiar difadvantage; for great velocity is fubject to great refiftance from the air, and great weight to much friction at the point of fufpenfion. Mr. Alexander Cummings was an advocate for a large arc with a fmall bob; but modern practice is in favour of a large ball or bob with a fhort arc of vibration. It feems to be generally allowed, that the momentum of a pendulum ought to be as great as poffible for a given maintaining power, provided the latter be fufficient to overcome all obftacles to conftant motion; but as the momentum is obtained in two different ways, it may be proper to fubjoin here an illuftration of them.

If a pendulum, moving in an arc of one degree from the quiefcent point, with a bob or ball of fix pounds, have its momentum denominated by unity, then the fquare of any given momentum will give its correfponding weight for another bob, moving in the fame arc; or the fquare root of the given momentum will give the arc of femivibration with the fame weight; for inftance, a momentum 4 will require $6 \times 4 = 24$ for the weight where the arc remains unaltered; but the root of $4 = 2$ will be the arc from the point of reft with the fame weight; again, if the momentum be required to be 9 for a given maintaining power, the weight muft be 54, or the arc 3° from the point of reft, and in the fame proportion for any other momentum; but, in fact, both the weight and arc may be varied according to circumftances, which latitude affords great variety in the adjuftment of the bob, and matter for multiplied experiments to determine what weight and arc fhall be moft defirable, taken conjointly under different circumftances.

The moft practicable method of adjuftment of the momentum of a pendulum, where a weight is ufed as a maintaining power, feems to be, to vary this power inftead of the weight of the bob or ball, which, when once finifhed of the requifite fhape, is not fo eafily altered. In pendulum clocks, actuated by a fpring as a maintaining power, fuch adjuftment cannot indeed be made in the power properly without changing the fpring, or altering the fufee after they are adjufted to each other; but as thefe inftruments are not intended to meafure time with great nicety, the adjuftment of the bob to the maintaining power is exactly done by guefs. In Huygens's beft clock, the maintaining power was equal to three pounds, falling about 90 inches in 24 hours, and the ball of its feconds pendulum, together with the pendulum itfelf, was alfo three pounds; but the nature of his efcapement required the vibrations to be performed in long arcs. Cummings tried different weights for his pendulums from 6 to 16 pounds, and various arcs from 3° to 6° from the point of reft; but it does not appear that any other ftandard has been adopted by clock-makers than what accords with the individual opinion of each. See MAINTAINING POWER.

BOB, in *Ringing*, denotes a peal confifting of feveral courfes, or fets of changes.

BOB-*ftay*, in *Sea-Language*, a rope ufed to confine the bowfprit of a fhip downward to the ftem, or cut-water, and to counteract the force of the ftays of the fore-maft, which draw it upwards.

It is fixed by thrufting one of its ends through a hole bored in the fore-part of the cut-water and then fplicing both ends together, fo as to make it two-fold, or like the link of a chain; a dead-eye is then feized into it, and a lanyard paffing through this, and communicating with another dead-eye upon the bowfprit, is drawn extremely tight by help of mechanical powers. The bob-ftay is the firft part of a fhip's rigging, which is drawn tight to fupport the mafts. With this view, it is ufual to fufpend a boat anchor, or other weighty body, at the bowfprit end, to prefs it downwards during the operation.

BOB-*ftay-holes*, are thofe holes in the ftem, or fore-part of the knee of the head, to which the bob-ftay is faftened.

BOBAC,

BOBAC, in *Zoology*. The bobac of the French and English writers is a sort of MARMOT with small, and somewhat oval ears; tail hairy; a claw upon the fore thumb; and the body grey above, and yellowish beneath. Gmelin calls this animal *arctomys bobac*.

There appear to be two varieties of this species, if not more. The bobac of Rzaczinski (Nat. Hist. Pol. p. 235.) described by Brisson, in his History of Quadrupeds, under the name of *marmotta polonica*, is of yellowish colour, inclining to reddish upon the head; but the bobac described by Pallas is of a greyish brown colour, with only the under parts yellow. In every respect, except the colour of the hair, these two varieties agree.

This creature is rather larger than the rabbit, measuring about sixteen inches from the nose to the base of the tail, the latter of which is four inches and an half in length; so that the whole animal measures above twenty inches. Dr. Pallas, to whom we are chiefly indebted for an account of the bobac, tells us, that it is a native of the high, but milder and sunny sides of mountainous countries, which abound with fissile, or free-stone rocks, where it is found in dry situations, and such as are full of springs, woods, or sand. It abounds in Poland and Russia, among the Carpathian hills: it swarms in the Ukraine, about the Boristhenes, especially between the Sula and Supoy; and then again between the Boristhenes and the Don, and along the range of hills which extend to the Volga. It is found about the Yaik and the neighbouring rivers; and inhabits the southern desert in Great Tartary, and the Altaic mountains, east of the Irtis. It ceases to appear in Siberia, on account of its northern situation, but is found again beyond the lake Baikal, and about the river Argun and the lake Dalay, in the sunny mountains about the Lena, and very frequently in Kamtschatka, but rarely reaches as high as latitude 55°.

The bobac is not considered as an article of food by the Mahometan Tartars. The Cossacks and the Calmucks, on the contrary, hunt and kill them for eating; the flesh, however, is very fat, and not in much esteem for the goodness of its flavour. In its manners of life the bobac resembles those of the Alpine marmot, with which it has been apparently sometimes confounded. It inhabits deep burrows, in societies of from twenty to twenty-four in each receptacle. Their habitation is lined with the finest hay; and it is said, the quantity found in every such receptacle is sufficient for a night's provender for a horse. In the morning, or the middle of the day, when the sun shines, they go abroad in search of food, always taking the precaution to station one of the party at the entrance of their cell as a centinel, who announces the least approach of danger with a whistle; and all, if within hearing, are thus enabled to provide for themselves in the best manner circumstances may require, either by returning for shelter to their cell, or remaining at a distance till the danger is over. The marmot, when attacked, rears itself upon the haunches, and defends itself with the fore paws. It eats with the fore paws, in the same posture. The bobac is an animal of a mild and gentle disposition, and may be easily domesticated. They are torpid throughout the winter, unless kept in a warm room. They breed early in the spring, and are said to produce six or eight young. The fat of this creature is used for dressing furs and leather.

BOBAN, in *Geography*, a town of Arabia, 32 miles S. of Saade.

BOBART, ROBERT, in *Biography*, curator of the botanical garden at Oxford, which had been lately instituted by lord Danby, published, in 1648, "Catalogus plantarum horti medici Oxoniensis," 8vo. The catalogue gives the names of about 1600 plants, many of them from Canada, first the Latin, then the English names, in alphabetical order. This was re-published in 1658, considerably improved and enlarged to more than double its bulk; Bobart being assisted in the work, as he acknowledges, by Dr. Philip Stevens and Wm. Brown, M. A. Besides the trivial names of the plants, there were now added those from Gerard, Parkinson, and Bauhine, which were not in the first edition. Bobart died in 1679, at the age of 81 years.

BOBART, JACOB, who succeeded his father, as curator of the garden, published, in 1699, the third volume of Morrison's "Plantarum historia universalis Oxoniensis, seu herbarum distributio nova, per tabulas cognitionis, ex naturæ libro detecta," fol.; making up by his own industry and sagacity what was deficient in the loose and imperfect sketches left by the author at his decease. There is an ingenious paper by this writer in the Philosophical Transactions for the year 1683, on the effects of the great frost, which happened the preceding winter, on trees and other plants. Many oak, elm, ash, walnut, and other trees, were found, he says, with large rents or clefts in different parts of their trunks, in the large branches, and in such parts of their roots as were not sunk deep into the earth. Parts, he adds, that were so knotted, that they could not have been split but with great difficulty with beetles and wedges, were rent asunder by the force of the ice contained within them, making, at the time of bursting, a noise like the explosion of gunpowder. It was supposed, that the trees which suffered were diseased, that some of the vessels were distended or burst, and that the effect was produced by the freezing of the sap or other juices contained in these cavities. Philos. Trans. abr. vol. iii. p. 89. Haller. Bib. Botan.

BOBARTIA, in *Botany*, (named in honour of James Bobart, formerly professor of botany at Oxford), a genus formed by Linnæus for a plant said to grow in the East Indies, with the following essential character:—*Glumes of the calyx* numerous; the exterior one short, univalved; the interior longer, bivalved; *glume of the corol.* single, shorter than those of the calyx, sitting on the germ, shrivelling. This generic character was first published in the Amœnitates Academicæ, vol. i. p. 113. (Lugd. Bat. Ed.); and in the Species Plantarum a reference is given to Scheucher, Gram. 369. Reichard added another supposed synonym from Plukenet tab. 30. fig. 7. Schreber, Jussieu, La Mark, and Bosc, have all taken it up from Linnæus; and La Mark, in his Illustrations, has copied Plukenet's figure. Willdenow, in his new edition of the Species Plantarum, has abolished the genus; asserting on the authority of Schumacher (Act. Soc. Nat. Hafn), that Linnæus drew up the character of his bobartia from a mutilated specimen of moræa spathacea, first completely described by Thunberg, and adopted by Linnæus the younger in the Supplementum Plantarum, p. 99.

The mistaken synonyms of Scheucher and Plukenet are referred by Willdenow to cyperus arenaria of Retz, of which Plukenet's figure, copied by La Mark, is said to be a good representation. A figure of moræa spadicea is also given by La Mark under its proper genus.

BOBARTIA. See also RUDBECKIA *Purpurea*.

BOBBIN, in *Commerce*, a term denoting about ¾ of a hundred of undressed flax.

BOBBING, or BOBBIN, a little piece of wood turned into a cylindric form, whereon thread is wound, to be used in the weaving of bone-lace.

The French also give the denomination *bobine* to what among us is more properly called a *spool* or *quill*. In which they are also followed by several English.

In this general sense, bobbins are used to wind thread, worsted, hair, cotton, silk, gold, and silver; and they are

of different lengths and sizes, according to the materials which are spun or wound.

Bobbing *for Eels*, among *Fishermen*, is an amusing method of catching eels, generally practised from the side of a boat, the piers of bridges, wharfs, or other situations where deep water can be at once reached. The bait made use of may be either scoured lob-worms, or garbage of any kind; which bait of whatever kind is strung lengthways on worsted, so as to completely cover it: some yards are prepared in this way, which are then tied up in links, making something like a bundle of fringe. So prepared, the bait is suspended from a strong rod or pole by two or three yards of packthread, leaded within a foot of the worms with more or less weight according to the strength of the current. The bait and lead must be sunk to the bottom, and suffered to remain, when the fish will soon be felt to nibble; but time must be allowed for them to make their hold secure, after which they may be gently pulled up to within a small distance, when a slight jerk will secure them. The mouths of rivers, muddy and deep places, where the tide reaches, are particularly favourable for this sport.

BOBBIO, or Bobio, *Bobium*, in *Geography*, a small town of Italy, and capital of a district of the same name, formerly belonging to the duchy of Milan, seated on the river Trebia, the see of a bishop, suffragan of Genoa, 30 miles N.E. of Genoa. It is now a canton of the district of Alexandria, in the department of Marengo.

Bobbio. See Biobio.

BOBENHAUSEN, a town of Germany, in the circle of the Upper Rhine, and principality of Upper Hesse; 17 miles east of Giesen.

BOBENNEUKIRCHEN, a town of Germany, in the circle of Upper Saxony, and the Vogtland; 6 miles S.W. of Oelsnitz.

BOBER, a river which runs into the Oder, at a small distance to the west of Crossen in Silesia.—Also, a town of Lithuania. N. lat. 55° 46′. E. long. 25° 46′.

BOBERG, a high promontory in the prefecture of Bosling, and diocese of Ripen, in Denmark, near which the coast is very dangerous, and has proved fatal to many ships.

BOBERSBERG, a town of Silesia, 9 miles S. S.W. of Crossen, and 28 S. of Franckfort on the Oder.—Also, a town of Germany, in the circle of Upper Saxony, and duchy of Crossen, 6 miles S. of Crossen.

BOBI, in *Conchology*. Adanson gives this name to the variety ε of *voluta perficula*.

BOBISATIO, or Bocedisatio, in *Music*, denotes the using of the seven syllables, *bo, ce, di, ga, lo, ma, ni*, to express the seven musical notes in lieu of the six usual ones introduced by Aretine, *ut, re, mi, fa, sol, la*, as has been sometimes done by the Netherland and German musicians since the beginning of the seventeenth century, to avoid the mutation necessary in the use of these latter.

BOBLINGEN, in *Geography*, a small town and district of the same name, of Germany, in the duchy of Wurtemberg, situate in a fertile country, and in the forest of Schonbuch, which abounds with game, having a castle seated on an eminence lying above the town. The district contains 12 parishes; and the vicinity produces some wine.

BOBR, a river of Lithuania, which runs into the Dnieper; 5 miles S.S E. of Rohaczow.

Bobr, in *Zoology*, a kind of marine otter, so called by the Russians, who reside at Kamtschatka, the precise species of which is doubtful. Some have imagined it to be allied to the castor.

BOBRITZSCH, in *Geography*, a town of Germany, in the circle of Upper Saxony, and country of Erzgeberg, 4 miles S. E. of Freyberg.

BOBROF, a district of the government of Voronetz, in Russia, seated on the Biliuk, falling into the Don.

BOBROWNIK, a town of Poland, in the palatinate of Lublin, 24 miles W.N.W. of Lublin.

BOBRYSLE, a town of Lithuania, in the palatinate of Minsk, seated near the river Berezyna. N. lat. 53°. E. long. 29° 12′.

BOBTI, a town of Lithuania, in the palatinate of Troki. N. lat. 55°. E. long. 24° 15′.

BOCA. See Bocca.

Boca *Escondida*, in *Geography*, a bay of North America, in the bay of Campechy, on the coast of Yucatan. N. lat. 18° 50′. W. long. 91° 46′.

Boca *Grand*, a bay of North America, at the mouth of the river Zucar, on the S. E. coast of Costa Rica. N lat. 10° 50′. W. long. 83° 26′

Boca *Tora*, a bay of North America, in the Caribbean sea, on the coast of Veragua. N. lat. 8° 58′. W. long. 82° 1′.

BOCABRITO, a town of North America, in the country of New Navarre, 65 miles east of Cinaloa.

BOCA-CHICA, the strait or entrance into the harbour of Carthagena, in South America; which was filled up since the attack of the English in 1741, who, having made themselves masters of the forts which defended it, entered the bay with an intent of taking the city; but their attempt miscarried, and they were obliged to retire with considerable loss. This event produced orders for opening the old entrance, by which all ships now enter the bay.

BOCA-DEL-DRAGO, a strait between the island of Trinidad and Andalusia, in the province of Terra Firma, South America.

BOCAGE, a small territory of France, in Normandy, of which the principal place was Vire.

BOCALIEAU, a small island, near the east coast of Newfoundland. N. lat. 48° 15′. W. long. 52° 26′.

BOCAMELE, in *Zoology*, the provincial name of an animal of the Mustella tribe found in the island of Sardinia. This is believed to be the creature described by Aristotle by the name of *Iktis*

BOCANA, in *Ancient Geography*, a town situate in the eastern part of the isle of Taprobana. Ptolemy.

BOCARDO, in *Logic*, the fifth mode of the first figure of syllogisms, wherein the first proposition is particular and negative; the second, universal and affirmative; and the third, or conclusion, particular and negative. Thus:

BOC	Some animal is not man
AR	Every animal has a principle of sensation.
DO	Therefore something has a principle of sensation, that is not man.

BOCAS, Las, in *Geography*, a town of North America, in New Biscay, 120 miles E. of Parmal.

BOCAT, the name of a valley in Syria, in which are the ruins of Balbec, of which Mr. Wood says, it might by a little care be made one of the richest and most beautiful spots in Syria; for it is more fertile, he adds, than the celebrated vale of Damascus, and better watered than the rich plains of Esdraelon and Rama. In its present neglected state, it produces corn, some good grapes, but very little wood. Here, it is supposed, was situated "Baal-hamon," which was the marriage portion of the bride of Solomon. Sol. Song. viii. 12. This estate was leased out to a variety of tenants, each of whom paid her a clear rental of a thousand shekels of silver, amounting to about 120 l. 16 s 8 d. sterling. Harmer's Outlines of a New Commentary on Solomon's Song, p. 35. Good's Song of Songs, Pref. p. 13. Bocat was also called "Bekaa," which see. See also Balbec.

BOCAUD, John, in *Biography*, born at Montpellier, where he received his education. In 1540, he was made doctor; and in 1544, on the death of Denis Fontenon, professor of medicine in the university there; an office he is said to have filled with distinguished honour to the time of his death, which happened in 1558. We have only one work published by this writer; "Tabulæ curationum et indicationum ex prolixo Galeni methodo, in summa rerum capita contractæ," fol. Lyons. Haller. Bib. Med. Pract. Eloy. Dict. Hist. Med.

BOCCA, a term used both in the Levant and on the N.W. coast of South America, or the Spanish main, for a mouth or channel into any port or harbour, or the entrance into a sound which has a passage out of it by a contrary way. See Boca.

Bocca, in *Geography*, a town of Italy in the duchy of Mantua, in the Comesfezza, 5 miles N.N.E. of Sabioneta.

Bocca *Tigris*, a name given by foreigners to the river Pe-kiang of China, near its discharge into the southern sea of China. See Pe-kiang.

Bocca, in *Glass making*, the round hole in the working furnace, by which the metal is taken out of the great pots, and by which the pots are put into the furnace. This is to be stopped with a cover made of earth and brick, and removeable at pleasure, to preserve the eyes of the workmen from the violence of the heat.

BOCCACCI, or Boccaccino, Camillo, in *Biography*, a painter of history and portrait, was born at Cremona in 1511; and, having received instructions in the art of painting from his father, removed to Rome, and assumed the Roman taste. His application was indefatigable, and his improvement so observable, that he was immediately employed in several noble works for the churches and convents He died young in 1546, when he was making rapid progress towards very high perfection. Pilkington

BOCCACCINI, Anthony, a surgeon of Comachio, a town in Ferrara, flourished in the early part of the last century. Reviving the practice of Magatus, in the cure of wounds and ulcers, which had fallen into disuse, he admitted no oily or greasy applications in the treatment of them, nor made use of tents or injections in the cure of abscesses, which, by irritating the parts, prevented, he said, their union, and frequently occasioned the orifices to become callous. His works, illustrating his practice, are "Cinque disinganni Chirurgici, per la cura delle ferite," Venice 1713, 8vo. treating of the cure of gun-shot wounds; "Cinque disinganni Chirurgici, per la cura delle ulcere," Ven. 1714, 8vo. with observations explaining and defending the doctrine of Magatus. Haller. Bib. Chirurg. Eloy. Dict. Hist. Med.

BOCCACIO, or Boccace, John, an eminent Italian writer, and one of the restorers of literature in Europe, was born of parents in low condition at Certaldo in Tuscany, in 1313. Declining that mercantile occupation for which he was originally designed, and in which he spent some of his earlier years, he devoted some time to the study of the canon law; but as soon as he had an opportunity of choosing for himself, he pursued a course of literature; and with this view sought instruction from the best masters, and at Florence put himself under the tuition of Leonzio Pilato for the Greek language. Besides the advantage he derived in furnishing his mind with stores of literature, and in cultivating a good taste, from conversation with the most learned men of his age, and from collecting and copying the most approved Greek and Latin writers of antiquity, he was particularly indebted for his progress in learning, and for his future reputation to the instruction and patronage of Petrarch, who was eminently useful to him both by his advice and by supplying him with money for aiding the prosecution of his studies, when his own patrimony was exhausted. By a diligent improvement of these advantages, he acquired such reputation, that the republic of Florence conferred upon him the honour of citizenship, and employed him in a variety of public transactions. Among other important commission with which he was entrusted, that of negociating the return of his friend Petrarch to Florence was particularly agreeable to him. But though his message to this purpose did not succeed, it afforded him an opportunity of establishing a more intimate and confidential correspondence with this patron of his youth. In 1353, two years after his visit to Petrarch, he was sent to pope Innocent VI. at Avignon. At this time he lived freely, and devoted himself chiefly to poetry and compositions of a lighter kind. During his rambles in Italy, he visited Naples, as some have said, in the year 1341, where he was favourably received by king Robert, and where he resided for some time. Here he fell in love with a young person whom he calls Fiametta, and who is commonly supposed to have been the natural daughter of Robert. In 1359, he had a conference with Petrarch at Milan, the result of which was his indulging more serious reflections than he had hitherto done; and having received an admonition in 1361, that his life would not be of long continuance, and that he would soon abandon poetry, his mind was so impressed that he immediately determined to relinquish his poetical lucubrations, and even the perusal of profane authors, and, against the counsel and remonstrance of Petrarch, to part with his library. About this time he assumed the clerical habit, and adopted a plan of conduct more guarded and regular than that of his past life. In 1362 or 1363, he again visited Naples; and without making any long stay there, went to Venice, and passed three months with his friend Petrarch. He was again deputed by his countrymen as ambassador to pope Urban V. at Avignon; and in 1367 he attended the pontiff under the same character at Rome. A public lecture on the "Comedia" of Dante, having been instituted at Florence, he commenced his expositions of that author in October, 1373; but, preferring the retirement of Certaldo, his native place, towards the close of his life, he died there in December, 1375. Boccacio was a voluminous writer both in prose and verse. His works in Latin were, a mythological treatise in 15 books, "De Genealogiâ Deorum," Basil, 1532, fol. esteemed excellent at the time when it was written, but long since superseded by more valuable publications of a similar kind; to this was annexed a "Treatise on Mountains, Rivers, Seas, Lakes, &c.;" with respect to both these he has been charged with plagiarism; "An Abridgement of the Roman History," from Romulus to the year of Rome 724, with a parallel of the seven kings of Rome and of the emperors to Nero, inclusively, Cologn. 1534, 8vo.; an historical treatise, in nine books, entitled "De Casibus virorum et fœminarum illustrium," beginning with Adam, and terminating with John king of France taken prisoner by the English at the battle of Poictiers, 1356, which work was translated into Italian, Spanish, French, and English, printed at Augsburgh, in 1544, and in French at Lyons, in 1483, and at Paris in 1578, by Claudius Vitart, under the title of "Traité des Mesaventures des Personnages signalez," 8vo.; and another book "De claris mulieribus." He also wrote in Latin a number of eclogues. In Italian poetry, his compositions were the "Theseide," in 12 books; the "Filostrato;" the "Ninfale Fiosolano," &c. &c. But though he was reckoned one of the three princes of the poets of that age, he is ranked only as the third of the triumvirate, precedency being assigned to Dante and Petrarch. It is said

ſaid, that he was duly ſenſible of his inferiority; and that, after having ſeen the ſonnets and ſongs of Petrarch, he determined to throw his own into the fire. His proſe works, which are more valuable, are his "Commentary on Dante," printed at Rome in 1544, 16to.; and at Florence, in 1576, 8vo. ſome romances of an amorous kind, intermixed with verſe, as "Il Filocopo," "La Fiametta," "L'Ameto," "Il Laberinto d'Amore," &c. &c. But his moſt celebrated production of this kind is his "Decamerone," or collection of one hundred ſtories, or novels, feigned to have been recited in ten days by a company of ladies and gentlemen, who had retired into the country from the plague of Florence in 1348. Theſe ſtories are partly founded on fact, and partly the productions of the author's own imagination; and they preſent a curious exhibition of characters and manners in all the ranks of ſociety. They abound with ſatirical ſtrokes levelled againſt the vices and frauds of the prieſts, and even the myſteries of religion; and the language, in ſome parts, is ſo free and licentious, that we may well wonder at their being recited before females of character and condition. However trite and vulgar many of the reflections may now appear, the ſtyle in which they are delivered is conſidered as a model of elegance and purity for the age in which they were written, and places the Italian language far beyond that of any modern nation at ſo early a period. No work was ever more popular, or more generally tranſlated, than the Decamerone. The ſtories that occur in this work have furniſhed materials for ſome of the moſt popular pieces of La Fontaine and other ſimilar writers. Boccace aſſumes the credit of having firſt brought the writings of Homer and of ſeveral other Greek authors from Greece to Tuſcany; and he was, without doubt, a moſt induſtrious and indefatigable copyiſt of the remains of antiquity. His poetry is pronounced by his countrymen to be as feeble and languid in its character, as his proſe is exquiſite and admirable. His valuable library was bequeathed to a convent in Florence, where it was long preſerved. For a further account of his life and writings, ſee Fabricius's Bibl. Lat. medii ævi. tom. 1. p. 248. &c.; and Tiraboſchi, tom. v. p. 83. 439—451. Gen Dict. Burney's Gen. Hiſt. Muſic, Vol. II. p. 338, &c.

BOCCALE, or Bocal, a liquid meaſure uſed at Rome, anſwering to what among us is called a bottle, being equivalent to about an Engliſh quart. Seven *boccales* and an half make the *rubbia*.

BOCCALINI, Trajan, in *Biography*, a ſatirical writer of the 16th century, was the ſon of an architect at Carpi, and born at Loretto in 1556. At Rome, where he principally reſided, he had acceſs, by the vivacity of his genius, to ſeveral perſons of rank, and among others to cardinal Bentivoglio, whom he inſtructed in geography. Protected from the danger to which his ſatirical turn expoſed him, by the influence of the cardinals Borgheſe and Gaetani, he alſo, by their recommendation, obtained ſeveral offices of truſt and honour in the eccleſiaſtical ſtate, and was appointed to the government of Benevento. But his public conduct occaſioned complaints, and he became obnoxious to the Spaniards, by expoſing with freedom and ſeverity their deſigns againſt the liberty of Italy, ſo that he was under a neceſſity of retiring to Venice in 1612. In the following year, it is ſaid that he was aſſaſſinated by four ruffians, who broke into his chamber at an early hour in the morning, and beat him ſo ſeverely with ſand-bags as to occaſion his death. Of his works, the moſt celebrated is his "Ragguagli di Parnaſo," or news from Parnaſſus, in which, under the fiction of a court in which Apollo preſides, he takes occaſion to ſatirize the actions and works of ſeveral perſons who paſs under review; but his reflections frequently betray the want of critical judgement and of a regard to truth. A ſecond part of this work written with the ſame views, is entitled "The Secretary of Apollo." His "Political Touchſtone," levelled againſt the Spaniards, is of a ſimilar kind. He alſo wrote the "Political Balance," "Commentaries on Tacitus," and ſome other works. Tiraboſchi. Gen. Dict.

BOCCARELLA, in the *Glaſs-Manufacture*, a ſmall hole or aperture of the furnace, one of which is placed on each ſide of the bocca, almoſt horizontally with it. Out of them the ſervitors take coloured or finer metal from the piling pot.

BOCCAS, in *Ichthyology*, the Arabian name of a fiſh belonging to the Scomber genus, obſerved by Forſkal in the Red Sea. Vide Scomber sansun.

BOCCHERINI, Luigi, in *Biography*, was born at Lucca in 1736, where he reſided till 1768, when he went to Paris, and where he continued till 1780. He then removed to Madrid, where, if living, he ſtill remains. His inſtrument is the violoncello, and though he writes but little at preſent, he has perhaps ſupplied the performers on bowed-inſtruments and lovers of muſic with more excellent compoſitions than any maſter of the preſent age, except Haydn. His ſtyle is at once bold, maſterly, and elegant. There are movements in his works, of every ſtyle, and in the true genius of the inſtruments for which he writes, that place him high in rank among the greateſt maſters who have ever written for the violin or violoncello. There is perhaps no inſtrumental muſic more ingenious, elegant, and pleaſing, than his quintets; in which invention, grace, modulation, and good taſte, conſpire to render them, when well executed, a treat for the moſt refined hearers and critical judges of muſical compoſition. A complete liſt of the works of this excellent compoſer would be of uſe to judicious collectors, as his genius, taſte, and judgment were too fertile and refined, to ſuffer him to commit to paper frivolous or indigeſted thoughts. His productions of 40 years ago have loſt nothing of their worth, nor will 40 years more wholly deprive them of their bloom.

BOCCHETTA, in *Geography*, a chain of mountains, over which is the high road between Lombardy and Genoa; on the ſummit of the higheſt, which is very ſteep, is a way ſo narrow that three perſons can hardly go a-breaſt, called "The Paſs of Bocchetta," defended by forts, and conſidered as the key to the city of Genoa. In 1746 the imperialiſts, having made themſelves maſters of this paſs, found little difficulty in proceeding to that capital. In 1778, a magnificent road was made from the Bocchetta to the north of Genoa, through the Polzevera, which, for the ſpace of three years, employed from 5 to 800 men, by the patriotic munificence of one noble family, the Cambiaſi. The Polzevera in the Bocchetta yields a beautiful ſtone which is ſerpentine, of various colours veined with marble.

BOCCHIANICO, a town of Italy, in the kingdom of Naples, and province of Abruzzo citra, 3 miles S.E. of Civita di Chieta.

BOCCIARDI, Clementi, called *Clementone*, in *Biography*, a painter of hiſtory and portrait, was born at Genoa in 1620, and after having been the diſciple of Bernardo Strozzi, went to Rome for improvement, by a judicious obſervation of the ancient ſculptures, and the works of the celebrated modern artiſts. By the efforts of his own excellent genius, and a diligent application to deſign, he diſcovered the art of blending the antique and modern guſts in a ſtyle both of gracefulneſs and ſtrength. Moſt of his works (his portraits excepted, which were lively, natural, and graceful,) are in the chapels of Genoa, Piſa, and other cities of Italy, where they are much eſteemed. Pilkington.

BOCCOLD, Bockholdt, or Beukels, John, commonly called *John of Leyden*, a journeyman-taylor, of Leyden, who, in the earlier part of the 16th century,

connected himself with John Matthias, a baker of Haerlem, and with his assistance displayed the astonishing effects of fanaticism and enthusiasm. These two anabaptist prophets, for this was the appellation which they assumed, fixed their residence at Munster, in Westphalia, and at length gained such a number of proselytes, that they became masters of the city, and established in it a new form of government, directed by Matthias, who issued his commands, with the style, and with the authority of a prophet. Matthias, having pillaged the city, amassed large hoards of wealth, and reduced all ranks to an equality, provided for its defence, by repairing and extending its fortifications, by forming all his followers, who were capable of bearing arms, into regular bodies, and by endeavouring to add the vigour of discipline to the impetuosity of enthusiasm. After these preparations, he sent out emissaries to the anabaptists in the Low Countries, inviting them to assemble at Munster, which he dignified with the title of Mount Sion, and from thence he proposed that they should set out to reduce all the nations of the earth under their dominion. The bishop of Munster, justly alarmed by these hostile appearances, assembled an army, laid siege to the town, and slew Matthias, with 30 of his attendants, in their first frantic sally. Matthias in the same year 1534, was succeeded by Boccold, who, more cautious than his predecessor, satisfied himself with carrying on a defensive war, whilst he waited for the succours from the Low Countries, which he encouraged his deluded followers to expect. But though less daring in action than Matthias, he was a wilder enthusiast, and of more unbounded ambition. Accordingly he marched naked through the streets, and proclaimed with a loud voice, "That the kingdom of Sion was at hand; that whatever was highest on earth should be brought low, and whatever was lowest should be exalted." In order to verify his declaration, he commanded the churches, and the most lofty buildings in the city to be levelled with the ground; and depriving Cnipperdorling one of the most considerable of their proselytes of the consulship, the highest rank in the commonwealth, he degraded him to the humiliating office of common executioner. In place of the deposed senators, he named 12 judges, according to the number of tribes in Israel, and reserved to himself the authority possessed by Moses as legislator of the people. He further declared to the assembled multitude, that it was the will of God, that John Boccold should be king of Sion, and sit on the throne of David. Accepting this heavenly calling, which he pretended to have received by a special revelation, he was immediately acknowledged as monarch by the deluded multitude, and assumed all the state and pomp of royalty. He wore a crown of gold, and was clad in the most sumptuous garments. A Bible was carried by him in one hand, and a sword in the other; he appeared in public attended by a body of guards, coined money with his own image, and appointed the great officers of his houshold and kingdom, among whom Cnipperdolling was nominated governor of the city, as a recompence for his former submission. As the excesses of enthusiasm have usually led to sensual gratifications, Boccold instructed his prophets and teachers to inculcate the lawfulness of a plurality of wives, as one of the privileges granted by God to his saints; and he himself set the example of this Christian liberty, as he called it, by marrying at once three wives, one of whom was the beautiful widow of Matthias. He proceeded with augmenting the number of his wives to fourteen, restricting, however the title of queen to Matthias's widow, and allowing no other to share with him the splendour and ornaments of royalty. The multitude availing themselves of his example indulged their desires to the most licentious and extravagant excess; and polygamy and freedom of divorce universally prevailed. The bishop of Munster, in the mean while, aided by the German princes, pressed closer the blockade of the town into which the siege had been converted; but its fortifications were so strong and so diligently guarded, that they durst not attempt an assault. But no succours arrived to the besieged; and after a close blockade of about fifteen months, they began to feel and lament the effects of scarcity. However, such was the fascinating influence of Boccold's promises and predictions, that no one seemed inclined, or at least possessed resolution enough to propose a surrender. One of his wives intimating a small doubt of his divine mission, was summoned before him as a blasphemer, and commanding her to kneel, he cut off her head with his own hands; his frantic followers at the same time dancing with joy round the bleeding body of their companion. Notwithstanding all the horrors of famine, the people of Munster still refused to capitulate. At length, however, a deserter made his escape to the enemy; and offered to head a party of the besiegers, under cover of the night, to a weak part of the fortifications, and less vigilantly guarded than any other. The proposal was accepted; and the party scaled the walls, seized one of the gates, and admitted the rest of the army. A dreadful carnage ensued; the king and Cnipperdorling were taken prisoners. The former, loaded with chains, was carried about from city to city, as a spectacle to the people; but notwithstanding all their insults, he maintained a firm and unbroken spirit; and adhered inflexibly to the tenets of his sect. He was afterwards brought back to Munster, and suffered the most exquisite as well as lingering tortures of death with astonishing fortitude; thus finishing an extraordinary course of delusion, at the age of 26 years. Bayle, Art. *Anabaptists*. Robertson's Hist. of Ch. V. vol. iii. p. 99. &c. Mosheim's Eccl. Hist. vol. iv. p. 452, &c.

BOCCONE, Paolo, or Paul, an ingenious naturalist, was born at Palermo, in Sicily, April 24th 1633. He was of a wealthy and respectable family, originally from Savona in Genoa. To improve himself in natural history, particularly in botany, to which he was early attached, he travelled over Sicily, Corsica, Malta, many parts of Germany, Holland, and England, conversing with the most eminent literary characters in the places he visited, with whom he afterwards kept up a correspondence. In the course of his travels, he was admitted doctor in medicine at Padua, was elected member of the Academ. Naturæ Curiof. and made botanist to the grand duke of Tuscany. In 1682, he entered among the Cistertian monks at Florence, and with the habit of the order took the name of Sylvio, which he affixed to his latter works, but he was still permitted to continue his researches in natural history. Returning at length to Sicily, he retired to one of the houses of the Cistertians near Palermo, where he died, Dec. 22, 1704. As he had been indefatigable in his researches, his collection of plants and other natural productions was very considerable. Sherrard, who saw his hortus siccus or specimens of dried plants, in 1697, was so struck with their number and beauty, that he engaged him to give a catalogue of them to the public, which he did in his "Musæo plante rare," published at Venice in 4to. the same year. The catalogue was also published by itself. Several of his works appear to have been printed while he was on his travels. The first of them, "De abrotano mare monitum," in 1668; and in the same year, "Manifestum botanicum, de plantis Siculis," Catanæ, 4to. By an advertisement at the beginning of the work he offers to botanists the seeds of many of the curious and rare plants he had collected at moderate prices. Morrison published an edition of this work at Oxford in 1674, 4to. under the title of "Icones et descriptiones rariarum plantarum Siciliæ, Melitæ, Galliæ, et Italiæ." Many of the plants, Haller says, were new. The figures are small, and in general not well delineated or engraved. His next production was "Recherches et observations naturelles," published at Paris in 1671,

1671, 12mo. again at Amsterdam in 1674, and again in 1744, in 8vo. It consists of letters to his correspondents in France, Italy, England, &c. In 1684, in 16mo. "Opervazioni naturali ove si contengono materie medico fisiche e di botanica," Bologna. The observations are 26 in number, and dedicated, or addressed to so many of the author's friends and patrons, among whom are many persons of high rank. He is very profuse in his elogia on the medical virtue of many of the plants, which he praises far beyond their real value. "Tenere oportet," Haller says, "credulum esse virum et in viribus medicis plantarum liberalem." "Musæo di fisica e di esperienze decorato di opervazioni naturali," Venet. 1697, 4to. The author here assumes the name of Sylvio. The observations are, as in the former work, dedicated to his noble patrons, and contain ample accounts of the medical virtues of various plants, much beyond what, from experience, they have been found to possess. Some smaller dissertations were printed in Miscel. Naturæ Curiof. and in the Journal des Savans. On the whole, Boccone appears to have been an industrious and intelligent writer, and to be deservedly reckoned one of the promoters and improvers of botany. Haller Bib. Botan. Eloy. Dict. Hist. Med.

BOCCONIA, in *Botany*, (named from Paolo Boccone, M.D.) a genus of the class *Dodecandria Monogynia*. Nat. Ord. *Rhoeadeæ*. *Papaveraceæ*, Jussieu. Lin. gen. 591. Reich. 643. Willden. 927. Schreb. 803. La Mark, p. 394. Gært. 44. Juss. 236.

Ess. Char. *Cal.* two-leaved. *Car.* none. *Style* bifid. *Pericarp*, two-valved. *Seed* one.

Gen. Char. *Perianth* two-leaved, ovate, obtuse, concave, caducous. *Cor.* none. *Stamens*, before the opening of the flower, from 12 to 24, afterwards seldom more than 10; very short. *Anthers* linear, very large, as long as the calyx. *Pist.* germ roundish, contracted both ways, large, pedicelled. *Style* one, bifid. *Stigmas* simple, reflex. *Pericarp.* capsule subovate, attenuated to each end, compressed, one celled, two-valved. *Valves* coriaceous, opening at the base; the annular suture crowned with the permanent style. *Seed* one, globular, involved in pulp at its base, fixed to the bottom of the capsule. *Observ.* The capsule resembles a silicule in its general shape, and in the permanent suture terminated by the style.

Species, 1. *Bocconia frutescens*, shrubby bocconia tree, celandine, or parrot-weed. "Leaves oblong, sinuated. Willd." An ornamental shrub, 10 or 12 feet high, with a straight, hollow trunk filled with pith, covered with a smooth, white bark, and divided near its summit into several cylindric branches. It abounds in all its parts with a thick, yellowish juice, similar to that of celandine. *Leaves* six or seven inches long, and about three broad; alternate, oblong, semipinnatifid; a little sinuated, with oval, unequally toothed segments; green and smooth above, glaucous, and a little tomentose beneath; on short petioles; flowers small, greenish, numerous, in large pyramidal, terminating panicles; bractes lanceolate.

It is a native of Mexico and the West Indies, where its acid juice is used to take off tetters and warts, and is also said to be employed in dyeing yellow. It has an evident affinity with the celandines in its sensible qualities and two-leaved caducous calyx, but differs remarkably from them in its incomplete flowers and monospermous fruit. La Mark conjectures that its want of a corolla is owing to the change of its natural petals into stamens: for, he observes, after the fall of the true stamens, four are constantly left, which continue as long as the calyx. See La Mark. Encyc.

The shrubby *bocconia* was first cultivated in England by Mr. Miller in 1739, and has flowered and ripened its seeds, in the physic garden at Chelsea. It is propagated by seeds, which should be sown in a pot filled with light fresh earth, early in the spring, and then plunged into a bed of tanner's bark, and occasionally watered. When the plants are come up, they should be transplanted into separate pots filled with light sandy earth, plunged again in the hot bed, and shaded from the sun in the heat of the day, till they have taken root: at first they should be sparingly watered, but when their stems are become woody, they will require a larger supply. In about two months, they should be transplanted into larger pots, and plunged again into the bark. In warm weather they should have a good share of fresh air, but should never be taken out of the stove.

2. B. *cordata*. "Leaves cordate, a little lobed." A native of China. *Panicle* elongated, with single, not divided, branches. *Calyx* white, as in the preceding species, but larger. *Stamens* about 24. *Style* none. *Stigma* bilamellated, sessile. Willdenow, by whom it was first described, as it should seem, from a dried specimen.

BOCCORE, in *Natural History*, בכורה, q. d. first and early fruit, a name given in the kingdoms of Algiers and Tunis, and also in Palestine, to the early fig, which was produced in June, in Palestine, though the kermez, or kermouse, the fig properly so called, which they preserved and made up into cakes, was rarely ripe before August, and sometimes hung upon the trees all the winter. These latter figs continued a long time upon the tree before they fell off; whereas the boccores dropped as soon as they were ripe, and, according to the appropriate and beautiful allusion of the prophet Nahum. (iii. 12.) fell into the mouth of the eater, upon being shaken. We learn from Pliny (N. H. l. xvi. c. 26.) that the fig-tree was bifera, or bore two crops of figs, viz. the boccore, as we may imagine, and kermouse: and it is well known that the fruit of these prolific trees always precedes the leaves; consequently, when our Saviour saw one of them, in full vigour, having leaves (Mark xi. 13.) he might, according to the common course of nature, very justly look for fruit, and haply find some boccores, if not some winter-figs likewise upon it. The time of the year in which the event referred to in this passage occurred, was undoubtedly three or four days before the passover, at which our Saviour was crucified, and the passover in that year fell in the beginning of April. But it has been inquired, how Christ could expect to find ripe figs on the tree at the latter end of March? to which it is replied, because figs were ripe so soon in Judæa. It has been satisfactorily proved, that the harvest in Judæa began at the passover, and ended at pentecost; and as the barley in Judæa was ripe in March, and the wheat in April, we need not wonder, if there were ripe figs in the beginning of April too, or before the time of the passover. This, indeed, was the usual time for the first ripe figs; and therefore it was natural to expect that there should be figs at this season, more especially as the tree had leaves, before which the fruit came forth; and as the "time of figs" as bishop Kidder has shewn, the time of gathering in ripe figs, was not yet come. When St. Mark says, "for the time of figs was not yet," he does not design to give a reason of what he said in the immediately foregoing clause, viz. "he found nothing but leaves," but he gives a reason of what he said in the clause before that, viz. "he came, if haply he might find any thing thereon." And it was a good reason for our Saviour's coming and seeking figs on the tree, because the time of gathering them was not yet come. The transposition above supposed, is not uncommon. See Mark, xvi. 3, 4. Gen xiii. 10. Josh. xxii. 22. See Hallett's Notes on Texts of Scripture, vol. ii. p. 115, &c. Harmer's Observ. vol i.

BOCH, John, in *Biography*, a modern Latin poet and classical scholar, was born at Brussels in 1555; and having

entered into the service of cardinal Radzevil, accompanied him to Rome, and there studied theology under Bellarmin. He afterwards travelled into Poland, Livonia, and Russia, and was in danger of losing his feet by the frost in his journey to Moscow. Upon his return to the Low Countries, the duke of Parma appointed him secretary to the town-house of Antwerp. He died in 1609. His poetical works, consisting of epigrams, elegies, heroic poems, &c. were collected, and printed at Cologne in 1615. He has been highly esteemed as a Latin poet by the critics of his country, and called the "Belgic Virgil." Gen. Dict.

Boch, in *Geography*, a river of the Netherlands which runs into the Meuse, 5 miles below Dinant.

BOCHARIA. See Bucharia.

BOCHART, Samuel, in *Biography*, a learned orientalist, was the son of a minister of the reformed church at Rouen, where he was born in 1599. Having studied polite literature at Paris, philosophy at Sedan, and divinity, with the oriental languages, at Saumur, and made a surprising progress at a very early age, he completed his course of oriental literature under Erpenius and Ludolf at Leyden. On his return to France, he settled as minister at Caen. In 1646, he published his "Phaleg" and "Canaan," the two parts of his "Geographia Sacra," a work of very extraordinary erudition and research, in which he investigates the history of the human race as recorded in the Bible, the dispersion of mankind, and the origin of nations and languages, together with a variety of collateral subjects. Notwithstanding the charge of fanciful interpretations and chimerical conjectures, which has been alleged against some parts of this work, it has long maintained a high degree of reputation, and furnished an ample supply of materials for modern writers. In the progress of this work, the author was led to pursue a variety of inquiries concerning the animals, vegetables, and minerals mentioned in the sacred writings, on which he intended to have composed distinct treatises; but he only completed that relating to animals, which was printed at London in 1663, under the title of "Hierozoicon." In this work the errors are such as must unavoidably occur at a period when the knowledge of natural history was very imperfect, compared with that of more modern times. In compliance with the invitation of queen Christina, Bochart visited Sweden in 1652, accompanied by the learned Huet, who wrote an humourous and elegant Latin poem on their journey. But finding that the capricious levity of the Swedish queen was not suited to his own grave character, he returned to France in 1653, and resumed his former studies. He was a member of the Academy at Caen, and, by his moderation and candour, maintained the distinguished reputation which he acquired by his profound erudition, together with the esteem and respect of persons of all parties, till the time of his death, which happened in consequence of an apoplectic stroke, during a disputation with Huet in the academy, May 16, 1667. Besides the learned works already mentioned, Bochart left several dissertations, particularly one, in which he attempts to prove that Æneas never was in Italy. His works were collected and printed by M. de Villemandy at Leyden in 1712, in 3 vols. folio. Gen. Dict.

BOCHO, in *Geography*, a town of Germany, in the circle of Upper Saxony, and principality of Querfurt, 3 miles S.E. of Juterbock.

BOCHOLNICZE, a town of Poland, in the palatinate of Sandomirz, 20 miles E. S. E. of Radom.

BOCHOLT, or Bockolt, a town of Germany, in a prefecturate of the same name, in the bishopric of Munster, and circle of Westphalia; seated on the Aa, and having iron mines in its vicinity; 36 miles W. S.W. of Munster.

BOCHOULT, or Bochout, a town of Flanders, situate on a canal cut from the Scheldt; 4 miles N.W. of Sas-de-Gent.

BOCK, Blauer Bock, in *Zoology*, a synonymous name of the *blue antelope, antilope leucophæa*. Kolbe.—Bock also signifies the male of the common goat. Gesn. Thierb.

BOCKA, or Buckau, in *Geography*, a mine town of Germany, in the circle of Upper Saxony, and country of Erzgeberg, 3 miles W. of Schwartzenberg.

BOCKENBURG, a town of Germany, in the circle of Westphalia, and bishopric of Minden, one mile from Minden.

BOCKENHEIM, a town of Germany, in the circle of the Upper Rhine, and county of Hanau-Munzenberg; 2 miles W. N.W. of Frankfort on the Mayne.

BOCK HORD, or Book-Hoard, in *Antiquity*, a place where books, evidences, or writings were kept.

BOCKHORST, John Van, in *Biography*, a painter of history and portrait of the Flemish school, was born at Munster, about the year 1610; and removing to Flanders, acquired the art of design and colouring in the school of Jacques Jordaens. He designed well; the heads of his women are generally graceful, and those of his men distinguished by character: his tone of colouring sometimes resembled that of Rubens, but more frequently that of Vandyck. His pictures have great force and harmony, and his skilful management of the chiaro-scuro produces an agreeable effect. An altar piece at the church of St. James in Ghent, representing the martyrdom of this saint, and a picture of the Annunciation in another church, painted in 1664, are distinguished performances of this master. Descamps. Pilkington.

BOCKI, in *Geography*, a small town of Poland, in Podalachia, in the palatinate of Bielsk.

BOCKING. See Braintree.

Bocking *herring*, in the *Dutch Trade*, signifies the same with bloated herring among us.

BOCK-KOGO, in *Geography*, a vast peak of the Brenner mountains in the Tyrol, rising little inferior to Gefrorn, and in the same latitude, but towards the west.

BOCK-LAND, or Book-land, formerly denoted that which we now call freehold-*land*, or charter-*land*; and it was by that name distinguished from folk-*land*, which was copyhold-*land*. In *Ancient Law-Writers*, it denotes a possession or inheritance held by evidence in writing. The word was doubtless written *book-land*, quasi *book-land*, answering to free-land, or land held by book or charter, which was regarded as free property, and descended to the heirs of the possessor. It stood opposed to folk-*land*, which was that held without writing.

BOCKUM, Bochum, or Bocheim, in *Geography*, a town and prefecturate of Germany, in the circle of Westphalia, and county of Mark; seated in a very fertile district, 24 miles N. E. of Dusseldorp, and 35 N. of Cologn.

BOCNIA, a town of Poland, in the palatinate of Cracow, famous for its salt-mines, first discovered in 1251. The small river called Raab, that falls into the Vistula, runs near this town, which is surrounded with hills and eminences. The salt-mine of Bocnia is in a narrow slip of land, about 750 feet in breadth from north to south, and about 10,000 feet in length from east to west, and its greatest depth below the surface is about 1200 feet. The salt lies in veins, and is somewhat finer, especially at a certain depth, than that of Wieliczka. It is cut in small pieces, and put up in casks. Large pieces of black wood have been found in this mine, which are incrusted with salt; and likewise ala-

baſter. The mines, which are very dry, are under the direction of the magiſtrates of Wieliczka. The town is 20 miles E. of Cracow.

BOCZEYKOWO, a ſmall town of Lithuanian Ruſſia, in the palatine of Polock.

BODÆUS A. STAPEL, JOHN, in *Biography*, was born at Amſterdam the beginning of the 17th century, where, at a proper age, he was admitted doctor in medicine, but attached himſelf particularly to botany, in which he acquired conſiderable celebrity. He died in 1636, at an early age, leaving a work, on which he appeared to have beſtowed much labour, prepared for the preſs, which was publiſhed ſome years after, viz. Joannes Bodæus, a Stapel, in Theophraſti Hiſtoriam Plantarum, fol. Amſt. 1644. Eloy's Dict. Hiſt. Med.

BODAISKA, in *Geography*, a town of Hungary, 7 miles W. of Patak.

BODDAERTI, in *Ichthyology*, a name given to a ſpecies of CHÆTODON. This has the body variegated with brown and blue bands, and the ventral fins armed with two ſpines. Schr. der. berl. naturf. Gmel. The habitat of this fiſh is unknown.

BODDAERTI, a ſpecies of GOBIUS, found in the Indian ocean. Pallas deſcribes it ſpecifically as having the rays of the anterior dorſal fin cirriform, and the third ray very long. This fiſh is ſix inches in length; the body bluiſh brown, pale and yellowiſh beneath, of a convex ſhape, tapering in a ſlight degree towards the tail, and covered with ſmall ſoft ſcales. The head is thick, blunt, ſomewhat convex, and ſpotted with brown and white. Jaws nearly equal. Lips thick and fleſhy: eyes vertical. Lateral line with ſcarcely perceptible papillæ, and a few ſnowy white ſpots. Each ſide of the back marked with ſeven black ſpots, and on the ſides below theſe as many dots of white. Vent nearer the head than the tail; ſurrounded by a black circle, with a conic peduncle behind. Dorſal fins, bluiſh-black, the anterior ones ſpotted with white, the other with ſetaceous rays, and ſix tranſverſe white lines between each ray. Pectoral fin rounded. Tail bluiſh white. In the firſt dorſal fin five rays, in the ſecond twenty-five; pectoral twenty-one; ventral thirty-four; anal twenty-five; caudal eighteen. Pallas. Gmel. &c.

BODECKEN, in *Geography*, a town of Germany, in the circle of Weſtphalia, and biſhoprick of Paderborn, 4 miles N. N. E of Buren.

BODEGAS, a town of North America, in the province of Verapaz, on the north-eaſt coaſt of Dolce-bay. N. lat. 15° 40′. W. long. 75° 35′.

BODEGNE'E, a town of France, the principal place of a canton, in the diſtrict of Huy, and department of Ourte; the place contains 320, and the canton 7422 perſons; the territory comprehends 107½ kiliometres, and 17 communes.

BODEGON, a town of Spain, in Andaluſia, 4 leagues from Seville.

BODEKKER, in *Biography*, a painter of portraits, was born in the country of Cleves, in 1660, and abandoning the profeſſion of muſic for which his father intended him, he was placed as a diſciple, in the art of painting, under John De Baan at the Hague. He commenced the exerciſe of his profeſſion at Bois-le-Duc and Breda with great reputation; and having reſided ſome time at the Hague, he cloſed his life in 1727, at Amſterdam, where his performances were much eſteemed. Pilkington.

BODENBURG, in *Geography*, a town of Germany, in the circle of Lower Saxony, and biſhopric of Hildeſheim; 8 miles N. E. of Alfeld.

BODENETZ, a town of Bohemia, in the circle of Chrudim; 10 miles N. of Chrudim.

BODENFELDE, a town of Germany, in the circle of Lower Saxony, and principality of Calenberg, ſeated on the Weſer in the quarter of Gottingen.

BODENHAUSEN, a town of Germany, in the circle of the Upper Rhine, and principality of Heſſe, 18 miles E. N. E. of Caſſel.

BODENI, in *Antient Geography*, a people of European Sarmatia, according to Ptolemy.

BODENLEICH, in *Geography*, a town of Germany in the circle of Lower Saxony, and principality of Luneburgh-Zell; 32 miles N. E. of Zell.

BODEN SEA, a name ſometimes given to the gulph of Bothnia, which ſee.

BODENSTEIN, ADAM, in *Biography*, a celebrated German phyſician, ſon of a famous theologian, called from the place of his reſidence, Carloſtadt, was born there in 1528. He was a pupil, and ſtrenuous defender of the doctrines of Paracelſus, in which he appears to have placed an entire confidence. For a malignant fever raging at Baſle, in 1577, he went there, armed with a Theriaca, compoſed on the principles of his maſter, with which he boaſted he ſhould be able to ſubdue the fever; but taking the infection, he fell a ſacrifice to his credulity and temerity. Beſides editing ſeveral of the works of Paracelſus, he left the following, which were collected and publiſhed in one volume folio, at Baſle, in 1581.

"Epiſtola ad Fuggeros, in qua Argumenta Alchymiam infirmantia, et confirmantia adducuntur; quibus et eam artem eſſe veriſſimam demonſtratur; lapiſque vere inventus oſtenditur." "De Podagra preſervatione, tractatus." "De herbis duodecim zodiaci ſignis, dicatis, &c." Adamus records his epitaph, placed on his monument, he ſays, at his own deſire, in which he is ſaid to have died, anno ſalutis, 1577, ætatis hebdomada ſeptima, for ſeven times ſeven, or 49 years. Alſo the following lines, in which Bodenſtein is ſuppoſed to ſay:

"Nec omnia, nec omnes mihi
Placuere: quinam ego omnibus?
Non omnibus cous ſenex,
Non eremita ſpagirus.
Nam tu viator omnibus?
Deo placere cura. Abi."

Adami Melch. Vitæ Germ. Med. Haller Bib. Med. Eloy Dict. Hiſt

BODENWERDER, in *Geography*, a town of Germany, in the circle of Lower Saxony, and principality of Calenberg, ſeated on the Weſer; 16 miles S. of Hamelen. It has ſome trade with Bremen and Hamburgh in coarſe linen.

BODEN-ZEE, a name given by the Germans to the ſuperior lake of Conſtance, which ſee.

BODERIA, or BODOTRIA, in *Antient Geography*, an æſtuary mentioned by Ptolemy in his deſcription of Great Britain, which is the preſent Firth of Forth in Scotland.

BODET *point*, in *Geography*, lies on the north ſhore of Lake St. Francis, near the boundary line between Upper and Lower Canada. *Bodet River* runs into lake St. Francis, E. of Bodet point.

BODGURVA, a town of Aſiatic Turkey, in the province of Natolia, 28 miles N. N. W. of Kaſtamoni.

BODIANUS, or BOBIANUS, in *Antient Geography*, a borough of Italy, which was repeopled by a decree of Julius Cæſar.

BODIANUS, *Bodian*, in *Ichthyology*, a genus of *Thoracic* fiſhes, firſt eſtabliſhed by Dr. Bloch, for the reception of ſuch ſpecies of the two Linnæan genera SPARUS and PERCA, as have certain characters common to both, and are not therefore ſufficiently diſtinct to be divided into two genera. The character of this new genus, as laid down in the firſt inſtance, conſiſts in having the gill covers ſcaly, armed, and ſmooth,

ſmooth, or even at the edges. Under this head Dr. Bloch deſcribes ten ſpecies only, namely, *Bodianus bodianus*, *bodianus guttatus*, *bodianus pentacanthus*, *bodianus bœnac*, *bodianus aya*, *bodianus maculatus*, *bodianus apua*, *bodianus macrolépidotus*, *bodianus ſtellifer*, and *bodianus argenteus*. Lacepede, in adopting the genus *Bodianus*, conſiderably augments the number of its ſpecies by the addition of others not previouſly deſcribed under either of the Linnæan genera. In his "Hiſtoire Naturelle des Poiſſons," there are altogether no leſs than four and twenty ſpecies. The generic character is modified, and two ſections formed to admit them. Its eſſential character is thus expreſſed: one or more ſpines to the gill covers, the margins of which are neither denticulated, nor jagged; only a little beard, or ſometimes none to the jaws; and a ſingle dorſal fin.

The firſt ſection of the Bodians include thoſe which have the caudal fin furcated in the form of a creſcent, of which there are fourteen kinds; le bodian œilére (*bodianus palpebratus*), le bodian louti, le bodian jaguar (*bodianus pentacanthus*) le bodian macrolépidote, le bodian argenté, le bodian Bloch (*bodianus bodianus*), le bodian aya, le bodian tacheté, le bodian vivanet, le bodian Fiſcher, le bodian décacanthe, le bodian lutjan, le bodian groſſe tête, and le bodian cycloſtome.

In the ſecond diviſion, the ſpecies of which have the tail fin entire, Lacepede deſcribes only ten, le bodian rogaa, le bodian lunaire, le bodian mélanoleuque, le bodian Jacob Evertſen, le bodian bœnac, le bodian hiatule, le bodian apua, le bodian etoilé, le bodian tétracanthe, and le bodian ſix raies.

The genus *Bodianus* is recogniſed, and admitted by Dr. Shaw into the general zoology. He includes in this tribe preciſely the ſame ſpecies as thoſe deſcribed by Dr. Bloch, with five additional ſpecies deſcribed by Lacepede as *Bodians*, namely, perca louti, Gmel. ſparus palpebratus, Gmel. perca rogaa, Gmel. perca lunaria, Gmel. and bodianus melanoleucus of Lacepede. But the generical definition of the *Bodianus*, as given by this author, is evidently at variance with that aſſigned to it by others. The great object of the Ichthyologiſt, in eſtabliſhing the new genus *bodianus*, muſt have been to ſeparate from the two genera *perca* and *ſparus*, ſuch ſpecies as do not ſtrictly belong to either; and unleſs this could be accompliſhed in a ſatisfactory manner, it were better to permit them to remain where Linnæus placed them. By ſome unuſual overſight Dr. Shaw appears to have failed in this reſpect; his bodiani are not ſufficiently diſtinguiſhed from the Linnæan percæ, as the following generic character will ſhew: "*Habit* of the genus perca. *Gill covers* ſcaly, ſerrated and aculeated. Scales (in moſt ſpecies) ſmooth. The *gill-covers* of the perca, according to this writer, are ſcaly and ſerrated, and the ſcales of the body (in moſt ſpecies) hard and rough. According to this definition; a perch with ſmooth ſcales, and the denticulations of the gill covers conſpicuouſly large, may be miſtaken for a bodian; and a hard ſcaled bodian, on the contrary, for a perch. If we are to allow an innovation on the Linnæan arrangement by the inſertion of the genus *bodianus*, its true character ſeems to be that the plates which conſtitute the gill-covers are ſmooth at the edges, and only armed with one or more diſtinct ſpines; while the ſerrated edges of thoſe plates as plainly point out the percæ: and if the plates be both ſerrated and aculeated, we conceive it highly proper to retain them under the old Linnæan genus *perca*.

BODIN, JOHN, in *Biography*, a famous lawyer of France, was born at Angers in 1530, he ſtudied the law at Toulouſe, and preferring the common to the civil law, quitted Toulouſe and entered at the bar in Paris; but not ſucceeding to his expectations, he devoted himſelf to literature. He commenced his career as a writer, with a tranſlation into elegant Latin verſe of "Oppian's Cynegeticon," or books of hunting, accompanied with learned notes, claimed as his own by Turnebus. His "Method of Hiſtory," was publiſhed in 1566, and his "Diſcourſe on Coins," with an anſwer to the paradoxes of Maleſtroit in 1568; but theſe were introductory to his great work in French, "Concerning a Republic," printed in 1576, in folio, and frequently reprinted in 8vo. To this work the preſident Thuanus bears very honourable teſtimony; it was alſo much commended by other perſons of learning; and obtained for the author a high degree of reputation throughout Europe It became the text-book of private lectures both at London and Cambridge. His tables of law, entitled "Juris Univerſi Diſtributio," were printed in 1578, and in the following year his "Demonomanie des Sorciers," to which was annexed "A Refutation of the book, de Lamiis," of John Wier, phyſician to the duke of Cleves, who had undertaken to prove that the ſtories of witchcraft and ſorcery have chiefly ariſen from impoſture or deluſions of fancy. The literary character of Bodin, who defended this kind of ſuperſtition, incurred reproach, and he himſelf was ſuſpected of being a magician. Before this time he had been invited by Henry III. to his court, who was much delighted with his converſation and treated him with attention and reſpect. But the royal favour was of no long continuance; for Bodin, who held an office in the preſidial court of Laon, was ſent, in 1576, as a deputy of the third eſtate of Vermandois, to the Aſſembly of the ſtates-general at Blois; where he remonſtrated againſt the project of alienating the royal demeſnes belonging to that province; and this he did with ſuch effect, that Thuanus principally aſcribed the defeat of the injurious ſcheme of alienation to his conduct on this occaſion. Bodin alſo reſolutely oppoſed the party of the Guiſes, who were endeavouring to procure a decree for compelling all the king's ſubjects to profeſs the catholic religion. By ſuch meaſures he became obnoxious at court; and he, therefore, accepted a propoſal made to him by the king's brother, the duke of Alençon and Anjou, to accompany him to his government of the United Provinces. He afterwards attended him to England, and, it is ſaid, that he adviſed the ſeizure of Antwerp, in conſequence of which the duke loſt both credit and influence. After the death of his patron, Bodin returned to Laon, and diſcharged the office of chief magiſtrate with great integrity. In this city he died of the plague in 1596. A work, written by him but never printed, and entitled "Heptaplomeron, ſive de abditis rerum ſublimium arcanis," is ſaid to have been an attack upon religion, and deſigned to invalidate the authority of revelation. By the ſeeming advantages which he gave in this work to the Jewiſh religion, he was ſuſpected of being a convert to it; but it is more probable, that he was a ſceptic with regard to religion, and alike indifferent to all modes of faith. A little while before his death he publiſhed a Latin treatiſe, entitled "Theatrum Univerſæ Naturæ," in which he purſues the cauſes and effects of things to their principles. Bodin was of an ardent and inquiſitive temper: and his erudition was ſuperior to his judgment. Gen. Dict.

BODLEY, SIR THOMAS, was born at Exeter in 1544, and at 12 years of age removed with his father to Geneva, who took his family thither to avoid the perſecution of queen Mary's reign. In the univerſity of that city he commenced his ſtudies; and when his father returned to England, on the acceſſion of queen Elizabeth, he was ſent to Magdalen college, Oxford, where he remained for ſome years, and became fellow of Merton college. Here he read lectures in Greek and philoſophy, and officiated as proctor and public orator. In 1576 he went abroad for improvement, and

ſpent four years in his travels. In 1583 he was made gentleman-uſher to the queen; and having married, he entered into public life, and was employed in various foreign embaſſies. At the Hague, where he reſided ſeveral years, his chief buſineſs was the negotiation of money-concerns between the States and queen Elizabeth. After his final return to England, in 1597, he found that his further advancement was obſtructed by the intrigues and jealouſies of perſons in power, and he therefore formed a fixed purpoſe of retiring from all public affairs, devoting the remainder of his life to the laudable employment of refounding the univerſity library at Oxford, furniſhing it with books, and enlarging the building. See LIBRARY. At the acceſſion of king James, Mr. Bodley received the honour of knighthood. He died in 1612, and was buried in Merton college choir. An annual oration is ſtill ſpoken in his praiſe. Biog Brit.

BODLEY, JOHN, who practiſed phyſic in London, in the beginning of the laſt century, publiſhed, in 1741, a critical eſſay on the works of various authors, particularly on thoſe treating on medicine, with the view of ſhewing that neither thoſe phyſicians who wrote the moſt correct and valuable treatiſes on medicine, nor thoſe who were the moſt intelligent practitioners, were uſually the moſt encouraged: fame and ſucceſs being more commonly the appendages of craft and policy, than of ſkill and judgment. A ſimilar opinion was held by the late Dr. Samuel Johnſon, who thought a judicious hiſtory of the fate of phyſicians might prove both an entertaining and uſeful work. Something of this kind was done by Pierius, in his book "De Literatorum Infelicitate," but on a larger ſcale, embracing the whole community of letters. Eloy. Dict. Hiſt.

BODINCOMACUM, in *Ancient Geography*, the name of a borough of Italy in Liguria, where, according to Pliny, the river Eridanus was at its greateſt depth; called in his time "Induſtria."

BODIONTICI, a people whom, according to Pliny, Galba annexed to Gallia Narbonnenſis; but before this time they formed a part of the Ligurians. M. D'Anville has placed them in the maritime Alps. Their capital was Dinia.

BODKIL, in *Geography*, one of the channels between Flanders and Walcheren iſland, in Zealand, by which great ſhips may ſail in.

BODMER, in *Biography*, a celebrated profeſſor and writer of Swiſſerland, was born at Zurich in 1698; and became profeſſor of Helvetic hiſtory and politics in his native place. In this office he taught his pupils to think for themſelves, and to make ſuch obſervations on hiſtorical facts as might render them intimately acquainted with the human heart. He wrote the hiſtory of his own country in the form of dramatic dialogues. Although he became one of the moſt voluminous of the German poets, and contributed in a great degree to reform the taſte of his contemporaries, and to familiarize them to the ſublime beauties of Homer and Milton, he had ſcarcely written a verſe in the German language before he was 50 years of age, when the firſt canto of Klopſtock's Meſſiah fell into his hands, and excited his emulation. His firſt eſſays were in epic poetry, the ſubjects of which he took from the Scriptures, but he afterwards devoted his muſe to other topics; and it is obſervable, that old age, which generally increaſes auſterity of manners, had the contrary effect on Bodmer; inſomuch that his laſt pieces were the moſt gay, and that when he was 80 years old, he frequently amuſed himſelf with Tibullus and Petronius, and alſo with Boccace and la Fontaine. At the age of 77, he began a tranſlation of Homer's Iliad and Odyſſey, which he finiſhed; he was 80, alſo, when he publiſhed his verſion of the Argonautics of Apollonius Rhodius. He died in 1783, at the age of 85 years. Bodmer has been deſervedly ſtyled by the unanimous voice of his contemporaries, "the father of German literature;" whoſe juſt criticiſms and correct judgment animated the poetical genius of Klopſtock, Haller, and Geſner. Bildniſſe, &c. or Portraits of celebrated German Literati, &c. Rome, 1793.

BODMIN, in *Geography*, an ancient borough and market town of Cornwall, England, is ſeated near the eaſtern borders of the county, on the confines of Devonſhire. This town appears to have been formerly the principal ſeat of religion in the weſtern diſtrict, and contained a priory, a collegiate church, and, according to Hals, thirteen other churches, or free chapels. The remains and foundations of ſome of their religious ſtructures ſtill exiſt; and the ſites of others are remembered by the old inhabitants. Among theſe were the priory with its chapel, &c. St. Peter's church, St. Paul's church, on the northern ſide of the town, of which a ſolitary ſquare tower remains; St. Nicholas, or the friary. The preſent town-hall and ſeſſion houſe occupy the ſite, and are conſtructed with parts of the latter building. The firſt religious foundation of Bodmin was removed to it from Padſtow, a town on the northern coaſt of the county, which being much infeſted by the Saxons and Danes, was the reſort of the monks for greater protection and ſafety. Here they eſtabliſhed the priory, and its various dependent buildings; all of which gradually decayed after the removal of the ſee. The town occupies the northern face of a hill, and conſiſts principally of one long ſtreet ſtretching eaſt and weſt. Near the eaſtern end of it is the pariſh church, a large ancient ſtructure, conſiſting of three ailes, and a tower which is attached to the north ſide. The chancel part is certainly the moſt ancient, and was formerly connected with the priory-building. An old chapel, now appropriated to a ſchool-room, ſtill remains near the eaſt end of the church, and a little farther eaſt is a neat modern manſion, occupying the ſite of the domeſtic part of the priory. A monument richly and curiouſly ſculptured, of one of the priors of this houſe, is carefully preſerved in the chancel. This was made to commemorate the name and official character of Thomas Vivian, who was biſhop of Megara, and died in 1533.

Bodmin is diſtinguiſhed among the numerous boroughs of Cornwall, as being the only one free from the controul of a patron. It was firſt made a borough in the time of Henry II. and its privileges were afterwards confirmed by king James I. who incorporated it in the 15th year of his reign. In 1799, a new charter was obtained, which veſted the government in a town clerk, twelve aldermen, and twenty-four common council-men, who hold the ſole privilege of electing two members for parliament. About half a mile N. W. of the town is a regular, commodious county gaol, which was begun building in 1779, from deſigns by Sir John Call, who planned it according to the ſyſtem recommended by the philanthropic Howard.

Bodmin gave birth to Dr. Richard Lower, an ingenious phyſician and anatomiſt, who made various experiments on the transfuſion of blood from one animal into another. This town has a market on Saturday, is 235 miles ſouth weſt from London, and contains 278 houſes, and 1951 inhabitants.

BODOBRICA, in *Ancient Geography*. See BAUDOBRICUM.

BODODO, in *Geography*, a town of Africa, in the kingdom of Benin, containing about 50 houſes, or little cabins, built of reeds and covered with leaves. Here a viceroy has his reſidence, attended by a council, whoſe juriſdiction extends over this canton in all civil affairs, levying taxes, and rating duties and impoſts on merchandize. In criminal caſes of

of great importance, the viceroy and council are obliged to send to Benin the capital, for the orders of the court.

BODOK, a district of Lower Hungary, in the province of Nitra, containing 101 large villages.

BODON. See WIDIN.

BODROG, a district of Hungary, near the Danube, 30 miles S. E. of Colocza, inhabited by Russians and a few Hungarians.—Also a River of Upper Hungary, which has its source in the Carpathian mountains, and discharges itself into the Theis near Tokay.

BODTY, in *Zoology*, the name of a certain kind of American snake, supposed to be of the *amphisbæna* tribe, but of which this species is apparently doubtful. The same snake is likewise called Ibijara.

BODUNGEN, *Great*, in *Geography*, a market town in Germany in the circle of Upper Saxony, and county of Klettenberg, 5 miles north of Bleicherode. *Little Bodungen* lies in the bailiwick of Lora, 4 miles north of Bleicherode.

BODWELL's FALLS, lie in Merrimack river, between Andover and Methuen, in North America, about 5 miles below Patucket falls.

BODY, in *Physics*, a solid, extended, palpable substance; of itself merely passive, and indifferent either to motion or rest: but capable of any sort of motion, and of all figures and forms.

The word alludes to the Saxon *bodige*, *stature*; and to the Belgic *boode*, *a cover*, q. d. *the tabernacle of the soul*. Body is composed, according to the Peripatetics, of *matter*, *form*, and *privation*; according to the Epicureans and Corpuscularians, of an assemblage of hooked, heavy *atoms*; according to the Cartesians, of a certain quantity of *extension*; according to the Newtonians, of a system or association of solid, massy, hard, impenetrable, moveable *particles*, ranged or disposed in this or that manner; whence result bodies of this or that form, distinguished by this or that name. These elementary or component particles of bodies must be infinitely hard; vastly harder than the bodies compounded of them; nay, so hard as never to wear, or break in pieces. "This" sir Isaac Newton observes, "is necessary in order to the world's persisting in the same state, and bodies continuing of the same nature and texture in several ages."

BODY, *affections of*. See AFFECTION.

BODY, *colours of*. See COLOUR.

BODY, *elements of*. See ELEMENT.

BODY, *essence of*. See ESSENCE.

BODY, *existence of*. See EXISTENCE.

BODY, *extension of*. See EXTENSION.

BODY, *modes of*. See MODE.

BODY, *motion of*. See MOTION.

BODY, *qualities of*. See QUALITY.

BODY, *solidity of*. See SOLIDITY.

BODY, *solid*, that whose particles cohere, or are some way connected with each other. See SOLID.

BODY, *fluid*, that whose particles easily slide over each other, and are of a fit size to be agitated by heat; or that whose particles do not cohere, but are easily put in motion by the smallest force. See FLUID.

BODY, *rough*, that whose surface is beset alternately with eminences and cavities, in contradistinction from a smooth body.

BODIES, *ductile*, those which being stretched do not break, but extend one way as much as they shrink another. Of these some are hard and malleable, as metals; others soft or viscid, as glues, gums, &c. Mem. Acad. Scien. an. 1713. p. 268.

BODIES, *flexible*, those which admit of being bent without breaking: such are thread, wire, fibres, and even glass, when spun very fine. These are contradistinguished from brittle bodies.

BODIES, *specific gravity of*. See GRAVITY, and WEIGHT.

BODY, *dense*. See DENSITY.

BODY, *rare*. See RARE.

BODY, *luminous*, or *lucid*, that which emits its own rays, or shines by its own light.

BODY, *illuminated*, that which diffuses the light of another by reflection, or which shines by borrowed light.

BODY, *opake*, that which intercepts the rays of light, or prevents their passage through it.

BODY, *transparent*, *diaphanous*, or *pellucid*, that which transmits the rays of light. See TRANSPARENCY.

BODY, *the inertia of*. See VIS *inertiæ*.

BODIES, *homogeneous*. See HOMOGENEOUS.

BODIES, *congruous*, those whose particles have the same magnitude and velocity, or at least harmonical proportions of magnitude and velocity.

BODIES, *incongruous*, those which have neither the same magnitude, nor the same degree of velocity, nor an harmonical proportion of magnitude and velocity.

BODY, *hard*. See HARD.

BODY, *volatile*, that which rises by the force of heat. See VOLATILE.

BODIES are divided into *animate* and *inanimate*; i. e. into those informed by a soul, and those which are not; or those that have life and those that have none.

Some consider bodies, either as *natural* and *sensible*; viz. as formed by physical causes, and clothed by physical qualities (in which sense, body makes the object of physics); or, as *intellectual* or *quantitative*, in the general or abstract; and according to three dimensions: in which sense, body makes the subject of geometry.

BODIES *alkaline*, *consistent*, *elastic*, *fixt*, *heterogeneous*, *atmosphere of*, *descent of*, *mercury of*. See the several articles.

BODY, with regard to animals, is used in opposition to *soul*; viz. for that part of an animal, composed of bones, muscles, canals, juices, nerves, &c. concerned in digestion, circulation, &c.

In which sense, body makes the subject of comparative anatomy. See ANATOMY.

BODY, *faculties of the*. See FACULTY.

BODY is also applied by anatomists to several particular parts of the animal fabric.—As the callous body of the brain, the cavernous or spongeous bodies of the penis, &c.

BODY, *reticular*. See RETICULAR.

BODY, in speaking of a horse, denotes the chest, but chiefly the flanks.

A horse is said to have a good body, when he is full in the flank; a light body, when he is thin or slender in the flank. If the last of the short ribs be at a considerable distance from the haunch-bone, though such a horse may have a tolerable body for a time, if he be much laboured, he will lose it. It is a general rule never to buy a horse that is light bodied and fiery, because he will presently destroy himself.

BODY *of a plant*, in *Botany*. See BOTANY.

BODY *of a piece of ordnance*, in *Gunnery*, that part comprehended between the centre of the trunnions and the cascabel. It ought always to be more fortified than the rest. See CANNON.

BODY *of a pump*, in *Hydraulics*, the thickest part of the barrel or pipe of a pump, within which the piston moves. See PUMP.

BODY, in *Geometry*, denotes the same with solid, which see.

BODIES, *regular*, or *Platonic*, are those which have all their sides, angles, and planes, similar and equal.

Of

Of these there are only five; viz. the *tetrahedron*, consisting of four angles; the *octahedron*, of eight; the *icosahedron*, of twenty; the *dodecahedron*, of twelve pentagons; and the *cube* of six squares. See REGULAR *bodies*; see also TETRAHEDRON, &c.

BODY, in *Law*.—A man is said to be bound or held in *body and goods*; that is, he is liable to remain in prison in default of payment.

A woman, though in other respects she cannot engage her person but to her husband, may *be taken by the body*, when she carries on a separate trade.

BODY *of the place*, in *Fortification*, denotes either the buildings inclosed, or more generally the inclosure itself. Thus, to construct the body of the place, is to fortify or inclose the place with bastions and curtains.

BODY is also used for an assemblage of several different things collected into one; more particularly a number of persons united into a company or college.

A state or nation, under the administration, of one sovereign, is called a *body politic*. All large empires are unnatural, because the relation between the head and limbs is here too remote. No body, either natural or politic, can long remain sound without exercise. See CORPORATION.

BODY, *corps*, in *War*, is an aggregate or assemblage of forces, horse and foot, united and marching under some chief.

An army, ranged in form of battle, is divided into three bodies: the van-guard, the rear-guard, and the main body; which last is ordinarily the general's post.

BODY *of reserve*, in the *Military Art*, a draught or detachment of a number of forces out of an army, who are only to engage in case of necessity.

BODY, in matters of *Literature*, a name given to a collection of whatever relates to any particular science; thus we say, the body of the canon law; the body of the Saxon law. King James I. had a design to compile a body of the English law.

The body of the civil law consists chiefly of the Institutes, Pandects, Code, and Novels. A *glossated* body, is that to which glosses are added in the margin, composed by several lawyers.

BODY is also used figuratively, for consistence, solidity, and strength. In this sense, we say the body of a cloth, wine, &c.

Vintners have divers arts of increasing or diminishing the body of wine.

BODY, among *Painters*.—A colour is said to *bear a body*, when it is capable of being ground so fine, and mixing with the oil so entirely, as to seem only a thick oil of that colour; as white-lead, lamp-black, vermillion, lake, indigo, &c. But verditers, smalts, &c. will not embody with the oil, but are still apt to separate from it in working.

BODY *plan*, or plane of projection, in *Ship-building*, is a section of the ship at the midship frame, or broadest place, perpendicular to the sheer and half-breadth plans. The several breadths, and the particular form of every frame of timbers, are described on this plane. As the two sides of a ship are similar to each other, it is therefore unnecessary to lay down both, hence the frames contained between the main frame and the stem are described on one side of the middle line, commonly on the right-hand side; and the after frames are described on the other side of that line.

BODZELIN, in *Geography*, a town of Poland, in the palatinate of Sandomirz, 24 miles south of Radom.

BOE, in *Ancient Geography*. See BOÆ.

BOE, a small island of Norway, 25 leagues north of Bergen.—Also, a town of Norway, 18 miles north of Bergen.—Also, a town of Norway, 12 leagues north of Romsdale.

BOEBE, in *Ancient Geography*, the name of a lake or marsh in the island of Crete. Steph. Byz.

BOEBIS, or BOEBIAS, a lake which some place in Bœotia, was situated near the confines of Magnesia, not far from mount Ossa. It has been since called the lake of Esero. North of this lake was a town called *Boebe*, whence the lake derived its name.

BOECE, or BOEIS, HECTOR, Lat. *Boethius*, in *Biography*, a celebrated Scottish historian, was born of an ancient family at Dundee, about the year 1470. After having studied in his native place, and also at Aberdeen, where he was professor in 1497, he went for further improvement to Paris, where he became a professor of philosophy, and where he had an opportunity of cultivating an acquaintance with several literary persons of eminence, and particularly with Erasmus. Upon the establishment of the king's college at Aberdeen, by Dr. Elphinston, the bishop, about the year 1500, Boethius was sent for by the founder, and appointed principal of that university, and contributed, in concurrence with his colleague Mr Hay, to furnish the kingdom with several excellent scholars. After the death of Elphinston, his patron, in 1515, he wrote his life, together with an account of his predecessors, under the title of "Vitæ Episcoporum Murthlacensium et Aberdonensium," Paris, 1522, 4to. He then engaged in his great undertaking of writing the history of Scotland, to which he prefixed a large geographical description of the country. This history was published under the title of "Scotorum Historia ab illius gentis origine," Paris, 1526, fol.; and he continued to improve it till his death, which happened about the year 1550. The first edition of this work consisted of 17 books, and ended with the death of king James I. The next edition printed at Lausanne and Paris, in 1574, fol. was much enlarged by the addition of the 18th and part of the 19th books. It was afterwards carried down to the end of the reign of James III. by J. Ferrerius, a native of Piedmont. The whole history was translated into the Scottish dialect by John Bellenden, archdeacon of Murray, by command of James V. and published in 1536. R. Holinshed published it in English, with considerable additions, in the first volume of his Chronicles. This work has been differently appreciated by national partiality on the one hand, and national prejudice on the other. Whilst it is allowed the merit of elegance and purity of style, it is charged with detailing marvellous tales and legends, and with introducing imaginary and fictitious circumstances, in order to ornament and dignify the antiquity of the Scots nation. As to his general character, Boethius was a great master of classical and polite learning, well skilled in divinity, philosophy, and history; but too credulous, and much addicted to the belief of legendary stories. With regard to his other accomplishments, he was discreet, genteel, well-bred, attentive, generous, affable and courteous. Biog. Brit.

BOECKEL, JOHN, born at Antwerp in November 1535, was admitted doctor in medicine at Bourges in 1564. At Hamburgh, where he went to reside, he was soon distinguished for his superior skill, and appointed teacher of anatomy and medicine, an office he filled with sufficient reputation several years. He died there March 21st, 1605. His works are "De peste quæ Hamburgum civitatem, anno 1565, gravissimé afflixit," Henricopoli, 1577, 8vo.; "Synopsis novi morbi, quem plerique catarrhum febrilem vocant, qui non solum Germaniam, sed pene universam Europam gravissimé

vissimé afflixit." Helmf. 1580, 8vo. This may be considered as the earliest record of the contagious catarrhal fever, which has many times since visited the world, and which has, in this country, been familiarly denominated the influenza. "Anatomia vel descriptio partium corporis humani," Helmf. 1585, 8vo. The text book from which the author gave his lectures, "De philtris. Utrum animi hominum his commoveantur, necne?" a question much agitated at that period of the world, but long since laid asleep. Haller. Bib. Anat. Eloy Bib. Hist. Med.

BOECLER, John-Henry, an eminent German philologist, was born at Cronheim in Franconia, in 1610, and preferred, at the age of 21, on account of his great learning, to the office of professor of eloquence at Strasburg. In 1648 he was invited to Sweden by queen Christina, and appointed to the chair of eloquence at Upsal, and to the office of royal historiographer; but being obliged by ill health to quit the country, he became professor of history at Strasburg. He was counsellor both to the elector of Mentz and to the emperor, and received a pension from Louis XIV. He died in 1692. His principal works are "Commentationes Plinianæ;" "Timur, vulgo Tamerlanus," 4to. 1657; "Notitia Sti. Romani Imperii," 1681, 8vo; "Historia, schola principum;" "Bibliographia critica," 1715, 8vo.; "Dissertationes Academicæ," 3 vols. 4to. 1710; "Animadversiones in Polybium," 4to. 1681; "Commentatio in Grotii librum de jure belli et pacis," 4to. 1712. He wrote, besides, Latin commentaries on various ancient authors, and several tracts on German history. Nouv. Dict. Hist.

BOEDROMIA, in *Antiquity*, from βοηθεμος, *helper*, derived from βοαω, *I cry*, and δρεμω, *I run*, solemn feasts held at Athens, in memory of the succour brought by Ion, son of Xuthus, to the Athenians, when invaded by Eumolpus, son of Neptune, in the reign of Erectheus. Plutarch gives another account of the boedromia, which, according to him, were celebrated in memory of the victory obtained by Theseus over the Amazons, in the month Boedromion, called by the Corinthians "Panemos;" which was, in the ancient chronology, the third month of the Athenian year. It consisted of thirty days, and answered to the latter part of our August and beginning of September.

BOEHM, in *Biography*. See Behmen.

BOEHMER, Philip Adolphus, son of Justus B. professor of anatomy at Hall in Saxony, under whom he received his education; was admitted doctor in medicine in 1736. As he applied his mind particularly to the study of midwifery, he gave for his inaugural thesis, "De precavenda polyporum generatione." His next dissertation, which was published in 1741, in 4to. was "Situs uteri gravidi, ac fœtus, ac sede placentæ in utero." In this he has given a critical examination of the midwifery forceps used in England, which he compares with, and prefers to Leuret's. These pieces were added by the author to his edition of sir Richard Manningham's "Compendium artis obstetricæ," published in 1746, 4to. Having acquired celebrity by these and other works, he was adopted member of the Acad. Nat. Curios. and foreign associate of the Royal Academy of Surgery at Paris. He was also appointed to succeed his father as professor of anatomy and medicine in the university at Hall. In 1749 he published "Institutiones osteologicæ, in usum prelectionum," 8vo. Haller particularly commends in this work the engravings of the embryos, and some fœtal skeletons. His "Observationum anatomicarum, fasciculus primus," folio, was published in 1752. Among many rare and curious objects are, an engraving of a pregnant uterus, to shew the membrana decidua, and a fœtus in one of the Fallopian tubes, with the placenta. The second collection, also in folio, published in 1756, contains a smaller fœtus in one of the tubes, and a child with two bodies and only one head. For the titles of the remainder of his dissertations, see Haller. Bib. Anat. and his collection of medical theses, in which the greater part of them is inserted.

BOEHMERIA, in *Botany* (named by Jacquin in honour of George Randolph Boehmer, professor of anatomy and botany at Wittenburgh), a genus of the class *Monoecia Tetrandria*, formed by Swartz for three plants, not described by Linnæus, natives of the West Indies, to which he added two others, the urtica cylindrica and the caturus ramiflorus of Linnæus. It constitutes a connecting link between urtica, and parietaria. Nat. Ord. *Scabridæ Urticæ* Jussieu. Schreb. 1421. Jacq. Americ. 246. Swartz. prod. 34. Jussieu. 403. Gen. Char. Male flowers on the same plant with the female, either distinct or mixed. *Cal.* perianth one-leafed, four parted to the base; segments lanceolate, acute, somewhat erect, coloured. Schreb. (tubular, Jussieu and Bosc.). *Cor.* none. *Nect.* none. *Stam.* filaments four, longer than the calyx, awl-shaped, erect; anthers roundish, ovate. Female flowers, *Cor.* none. *Pist.* germ ovate, compressed; style filiform, erect, permanent; stigma simple, pubescent. *Pericarp*, none. *Seed*, roundish, compressed, margined. Schreb. (single, very small, enclosed in the permanent calyx. Juss. Bosc.). The flowers are separated from each other by numerous, dense, ovate-acuminate, bractes or scales.

Species, 1. B. *caudata*. Brown Jam. 238. "Leaves opposite, ovate, acute, serrate; racemes very long, pendulous; flowers diœcous; stem suffruticose." A shrub ten or twelve feet high. Brown calls it the nettle-tree. 2. B. *littoralis*. "Leaves opposite, ovate-lanceolate, serrate; flowers conglomerate, axillary, monœcous, mixed; stem herbaceous, four-cornered." Native of Hispaniola. 3. B. *cylindrica*: "Leaves opposite, ovate, acuminate, serrate; racemes spiked, axillary, erect, simple." An annual plant, with a lucid, herbaceous stalk, dividing into several branches; leaves with three longitudinal veins; on pretty long petioles. A native of North America and Jamaica. 4. B. *ramiflora*. "Leaves alternate, broad-lanceolate, acuminate, serrate, wrinkled; flowers aggregate, axillary and lateral, monœcous, distinct. Males three-stamened." A shrub, eight feet high, with long branches; leaves sickle-shaped, rugged on very short petioles, placed towards the end of the twigs; very different in size, some being two inches, and others a foot in length on the same twig. Male flowers small, yellowish, numerous, aggregate, on the leafless old branches. Female flowers whitish on the younger twigs to the very end. Native of Jamaica and other Islands of the West Indies. 5. B. *hirta*. "Leaves alternate, ovate, acute, serrate, hirsute; flowers monœcous, heaped, axillary, mixed." A native of Jamaica.

La Marck has not inserted this genus either in the alphabetic part of the Encyclopedie, or in the subsequent systematic series of figures. He follows Linnæus in referring the cylindrica to urtica, and the ramiflora to caturus.

BOEL, Peter, in *Biography*, an excellent painter of fruit, flowers, and animals, was born at Antwerp in 1625, and having been a disciple of Snyders, whose widow he married, he went to Italy, where his uncle Cornelius de Waal resided, and in his return through France, was much employed, particularly at Paris, where he continued for some time. He died in 1680. As an artist he copied after nature, with a free and bold pencil, and a tint of colour that was natural and beautiful. There are some few slight, but spirited, etchings by Boel, from his own compositions, representing various animals, &c. Cornelius Boel, who flourished in 1611, and Coryn, or Quirin Boel, who flourished in 1660, both engravers, were of the same family. Pilkington. Strutt

BOELE-

BOELE-BOELE, in *Geography*, a diſtrict of the iſland of Celebes, ſituated in the bay of Boni, at and near a river of the ſame name. To the weſt it has Wauwo Woele; to the ſouth, the river Caſſa; to the north, the river Tanka; and to the eaſt, the ſhores of the bay. It is ſometimes called *Tellolimpoe*, and has three chief townſhips, viz. Boele-boele, Lamant, and Radja, which are all independent of each other. The kings of Boni conſider it as an appendage of their crown.

BOELE-COMBA, a territory of Celebes, which was anciently a ſeparate kingdom, but in later times it was ſubjugated by the Macaſſers; and is become one of the provinces belonging to the Dutch Eaſt India company. It ſtretches from the river Kalenkongang, which divides it from Bontain, to Bera, or rather to the river Bampang, which runs between them; to the north of it lie the mountains of Kyndang, which ſeparate it from Boni, or rather from the highlanders of Touraayo; and to the ſouth, it is waſhed by the ſea. The land is fertile in rice, and abounds in game and extenſive foreſts; but the timber is not adapted to the conſtruction of houſes. When the weſt monſoon renders it dangerous for ſhips to lie in the road before Boele-Comba, they run into the river Kalekongang, near the mouth of which ſtands the paliſadoed fort Carolina, in which the reſident of the Dutch Eaſt India company, who is a junior merchant, has his abode. The province of Bera reaches from the river Bampang eaſtward, along the ſea-coaſt to the point of Laſſem or Laſſoa, and thence northward to the point of Cadjang; and on the land ſide, it borders upon Boele-Comba, Tourang, and Kadjang, belonging to Boele-boele. This country belongs to the Dutch company. It is barren and rocky, but has ſome woods which furniſh timber fit for building proas. The men are good warriors both by ſea and land; the richeſt are merchants; and others employ themſelves in building proas, and in manufacturing a ſort of coarſe white cloth from the cotton which the place ſupplies.

BOELON. See Bælon.

BOEN, in *Geography*, a town of France in the department of the Loire, and chief place of a canton in the diſtrict of Montbriſon, ſeated on an eminence near the river Lignon; 6 leagues ſouth of Roanne, and $3\frac{1}{2}$ north of Montbriſon. The place contains 1220, and the canton 10,929 perſons; the territory comprehends 305 kiliometres, and 22 communes.

BOENAC, in *Ichthyology*, a ſpecies of Bodianus, deſcribed by Dr. Bloch. The body is of a clear olivaceous colour, marked with ſeven oblique brown bands; and the caudal fin is rounded. This fiſh is mentioned as a native of the ſeas about Japan, where it is called ycan boenac.

There are ſeven rays in the gill membrane of this ſpecies, fifteen in the pectoral fin, ſix in the ventral fin, eleven in the anal fin, ſixteen in the caudal fin, and twenty-five in that on the back.

BOENASA, in *Ancient Geography*, a town of Cappadocia, in the interior of the Galatic Pontus. Ptolemy.

BOEON, a town placed by Ptolemy in the interior of the Tauric Cherſoneſus.

Boeon, or Boelo, a town of Greece, in the Doric region, according to Thucydides, near mount Parnaſſus. This was one of the four cities which, according to Pliny, Strabo, and Steph. Byz. gave the name of "Tetrapolis" to the country poſſeſſed by the Dorians, near mount Oeta.

BOEONUS, *Diu*, an iſland of India, according to the Periplus of the Erythræan ſea, placed by M. d'Anville at the ſouth-weſt entrance of the "Barygazenus ſinus."

BŒOTIA, a name given to two ancient kingdoms of Greece; one founded, or rather reſtored by Cadmus, and called by him Bœotia, from the ox (*bos*), which is ſaid to have directed him to the place where he built the capital of his kingdom, afterwards known by the name of Thebes; the other in Theſſaly, ſaid to have been founded by Bœotus, the ſon of Neptune, and brother of Œolus, by Arne, the daughter of Œolus king of Œlis. This Bœotus, according to Bryant (Anal. Anc. Myth. vol. ii. p. 326.), from whom the Bœotians are ſuppoſed to be deſcended, and from whom this country is ſaid, by ſome, to have derived its name, was an imaginary perſonage, and merely a variation of Boutus and Butus, the ark; which in ancient times was indifferently ſtyled Theba, Argus, Aren, Butus, and Bœotus. This Bœotus of Greece, according to the mythology of this writer, is the ſame with Boutus of Egypt, Battus of Cyrene, and Buto or Budde of the Indians. The hiſtory of the origin of this kingdom is intermixed with fables; but it is more certainly known, that the poſſeſſors of this ſettlement held it for more than 200 years; and that when they were expelled from it by the Theſſalians, they ſought a new eſtabliſhment in that country, which till that time had been called Cadmeis, and which was then named Bœotia. We are informed by Diodorus and Homer, that theſe Bœotians ſignalized themſelves at the Trojan war; and the latter adds, that five of Bœotus's grandſons were the five chiefs who led their Bœotian troops thither. Whatever be the true etymology of the name Bœotia, given to this country, it was diſtinguiſhed by ſeveral other appellations, according to its ſuppoſed founders: thoſe, who aſcribed it to Ogyges, called it Ogygia; others called it Cadmeis, from Cadmus; and by others it was denominated Aonia, from Aon, the ſon of Neptune; and Hyanthis, from Hyas, the ſon of Atlas. It is now called Stramulippa; and Thebes its ancient capital, Thive, and corruptly by the Greeks, Stibes or Stives.

It bordered on the eaſt with Attica, and was in time joined to it, being parted from it by the mountain Cithæron; on the north, it was bounded by the ſtreight Euripus, now called the Negropont; on the weſt it had the kingdom of Phocis; and on the ſouth, the gulf of Corinth. Its utmoſt extent from eaſt to weſt was 1° 10′, and it was nearly of the ſame length from north to ſouth, but approaching to a point eaſtward. Ephorus, from Strabo, calls it μοιν τριθαλαττος, *ſola trimaris*, becauſe it was contiguous to three ſeas; and by means of its commodious havens it could carry on a commerce on one ſide with Italy, Sicily, and Africa; and on the other, with Egypt, the iſle of Cyprus, Mauritania, and the Helleſpont. It had alſo the large lake Copais, and the two large rivers, the Aſopus and Iſmenus, beſides other ſtreams, by which it was watered and rendered fertile. This country is partly hilly, eſpecially Aonia, properly ſo called; the reſt is low and flat, and abounding with excellent paſturage and corn; but the air was ſo denſe and foggy, that Horace thought it influenced the genius of the inhabitants. The Bœotians, in general, were reckoned not to poſſeſs that penetration and vivacity, which characterized the Athenians, whoſe air was remarkably pure, though ſeparated from them only by mount Cithæron; but this, perhaps, might have been attributed more to education than to nature. As they employed their time more in bodily than in mental exerciſes, they were deficient with reſpect to that facility of expreſſion, thoſe graces of elocution, the knowledge derived from ſtudy, and thoſe pleaſing manners, which are more the work of art than nature. But it ſhould not be ſuppoſed, that Bœotia produced no men of genius. Several Thebans have done honour to the ſchool of Socrates. Epaminondas was not leſs diſtinguiſhed for his knowledge than

for his military talents. It ſhould alſo be remembered, that Bœotia was the birth-place of Heſiod, Corinna, and Pindar. Its moſt remarkable places were the Trophonian cave, Theſpia, Aulis, the ſtraits of Thermopylæ and Thebes, which ſee reſpectively.

The government of Bœotia was altogether monarchical, and peculiarly deſpotic, the will of the kings being the law; and of theſe ſome governed more like tyrants than moderate ſovereigns. Plutarch, in his "Morals," mentions an ancient cuſtom that prevailed among them; which was the manner of introducing their new-married women into their new habitations. They were brought home in a kind of chariot, or cart, the axle-tree of which was immediately burnt, thus intimating to the bride, that ſhe was fixed with her huſband for life, and muſt not expect to return to her parents.

The Bœotians, as to their general character, were courageous, inſolent, and vain; and with them the tranſition was very ſhort from paſſion to inſult, and from a contempt of law to a total diſregard of the dictates of humanity. The ſmalleſt expectation of advantage gave occaſion to the groſſeſt acts of injuſtice; and murders were frequently the conſequence of the moſt frivolous quarrels. The women were tall, well-formed, and generally of a fair complexion; and their voice was remarkably ſweet and tender; whereas that of the men was harſh and diſagreeable, and in ſome meaſure ſuited to their character. Of this character for inſolence and ferocity, which generally diſtinguiſhed the Bœotians, no traces were to be found in a body of young warriors, called the "Sacred Battalion," conſiſting of 300, who were brought up together, and maintained at the public expence in the citadel. Their exerciſes, and even their amuſements, were regulated by the melodious ſounds of the flute. To prevent their courage from degenerating into blind fury, care was taken to inſpire them with the nobleſt and the moſt animated ſentiments. From this band each warrior choſe a friend, to whom he remained inſeparably united, whom it was his ambition to pleaſe, and to ſhare his pleaſures and ſufferings in life, and his labours and dangers in battle. Theſe 300 warriors were at one time diſtributed in troops at the head of the different diviſions of the army. Pelopidas, who had frequently the honour of commanding them, having made them fight in a body, the Thebans were indebted to them for almoſt all the advantages they gained over the Lacedæmonians. Philip deſtroyed this cohort, that had been invincible, at Cheronæa; and the prince when he ſaw theſe young Thebans ſtretched on the field of battle, covered with honourable wounds, and lying ſide by ſide on the ground on which they had been ſtationed, could not refrain from tears, but bore a noble teſtimony to their virtue as well as to their valour. Plut. in Pelop. t. 1. p. 287.

For the ſucceſſion of the kings of Bœotia, after Cadmus, and the hiſtory of the kingdom as a monarchy, ſee THEBES. The Bœotians, after having expelled their kings, who had reigned in ſucceſſion from Cadmus to Xanthus, for about 300 years, formed themſelves into a republic, of which the chief magiſtrates were the prætor, or ſtrategos, the Bœotarchi, and the Polemarchi. The authority of the prætor, who was choſen from among the Bœotarchi, laſted only a year, and reſembled that which was veſted in the prætors of Achaia and Ætolia. The Bœotarchi aſſiſted him with their advice, principally in time of war, and commanded under him; and they conſtituted the ſupreme court in military affairs; ſo that the prætor could not act in a manner contrary to their determinations. They alſo bore a great ſway in the civil adminiſtration, and hence derived their title. Their number was uncertain, being 7, 9, or 11; they were choſen yearly, and obliged by law, as well as the prætor, to reſign their office on pain of death, before the firſt month of the new year was expired. The Polemarchi were altogether civil magiſtrates; it being their province to maintain peace and concord at home, while the Bœotarchi were employed in the wars of the republic. Beſides theſe officers, there were four councils in which the whole authority of the ſtate conſiſted. Theſe were compoſed of the deputies that were ſent by all the cities of Bœotia; and without their approbation, the Bœotarchi could not declare war, make peace, conclude alliances, or tranſact any buſineſs of importance. The Bœotians, and eſpecially the Thebans, were continually haraſſed by the princes of Macedon; nevertheleſs they took part with Philip againſt the Romans, and could not be prevailed upon by the Athenians and Achæans to deſert him, and to join the other ſtates of Greece, till he was entirely defeated in the famous battle of Cynocephalæ. They then, foreſeeing their danger, ſent deputies to Flaminius, imploring his protection. He received them with great humanity, and put them upon the ſame footing with the other allies of the republic in Greece. Flaminius, at their requeſt, obtained the releaſe of the Bœotians who ſerved in the Macedonian army; but notwithſtanding this favour granted them by the interpoſition of the proconſul, they neglected to make the neceſſary acknowledgments, and filled up all vacant offices with perſons who were enemies to Rome, and attached to the intereſts of Macedon. Flaminius was exaſperated by this conduct; and Brachyllus, their prætor, was murdered by the friends of Rome. The murderers, however, were diſcovered, and one of them, Piſiſtratus, was put to death. For this murder of their prætor the Bœotians determined to be revenged; and they took occaſion to aſſaſſinate all the Romans whom they found wandering about in the fields. In conſequence of this outrage, Flaminius ravaged their territories; but upon their conſenting to deliver up the offenders, he deſiſted from any further acts of ſeverity; and the Bœotians duly apprized of his lenity, continued ever afterwards faithful to the Romans. But as ſome of their leading men joined Perſes, king of Macedon, in his wars againſt the Romans, the whole country was, on that account, treated with great ſeverity; Rome being at this time under no apprehenſion of an invaſion from Antiochus, as ſhe was when Flaminius was ſo eaſily appeaſed. At the diſſolution of the Achæan league, Bœotia, with the reſt of Greece, was reduced to a Roman province. See ACHÆANS.

BOER, in *Geography*, a town of Germany, in the circle of the Lower Rhine, and county of Recklinghauſen, 6 miles W.S.W. of Recklinghauſen, and 42 N. of Cologn.

BOERHAAVE, HERMAN, in *Biography*, a profeſſor of medicine and chemiſtry, of ſuch eminence as to form a new æra in theſe ſciences, was born at Voorhout, about two miles from Leyden, in Holland, the 31ſt of December 1668. His father, James Boerhaave, the paſtor of the village, having nine children, took on himſelf the care of their education; and, as he intended Herman for the church, he was careful to ground him well in Greek and Latin. In theſe languages he made ſuch rapid progreſs, that when he was only fourteen years of age, his father ſent him to complete his education to the public ſchool at Leyden; and, in 1684, he went from thence to the univerſity. His father dying ſoon after, and in ſlender circumſtances, the progreſs of our young ſtudent's attainments would have been interrupted but for the friendly aſſiſtance afforded him by Daniel Van Alphin, burgomaſter of Leyden, who furniſhed him with the means of continuing his ſtudies. The kindneſs of this worthy man was remembered by Boerhaave, with gratitude, to the end of his life. He now applied to the mathematics, and to acquire a knowledge of the Hebrew and Chaldee languages; propoſing, agreeably to the intentions of

of his father to qualify himself for the ministry; and that he might relieve his patron from a part of his expence, for his sustenance, he gave private lessons to the students in mathematics, and here probably laid the foundation of that excellence in the art of communicating knowledge by lectures, for which he in time became so celebrated. In 1690, he took his degree in philosophy, and gave for his inaugural thesis, "De distinctione mentis a corpore," in which he refutes in a solid and judicious manner, the errors of Hobbs and Spinosa. This, however, did not prevent his being suspected of Spinosism, which made him quit his intention of entering into the service of the church, and turn his mind to medicine, particularly to the study of chemistry, as more suited to the activity of his disposition. To acquire a knowledge of anatomy, he read the works of Vesalius, Fallopius, and Bartholine, and attended dissections under Nuck. In medicine, he studied Hippocrates, and the rest of the Greek and Latin writers in succession, but returned to Hippocrates, whose works were always mentioned by him with veneration. Among the moderns, he gave the preference to our countryman Sydenham, whom he called the Divine Sydenham.

Thus qualified, in 1693, being 25 years of age, he was admitted by the university of Harderwyck, in Guelderland, to the degree of doctor in medicine. His thesis on this occasion was "De utilitate explorandorum excrementorum in ægris, ut signum." To the urine he paid the greatest attention. He now applied to the practice of medicine, from which, however, he is said to have derived but little profit. As his practice, therefore, employed but a small portion of his time, he had leisure for examining all the theories of medicine which had prevailed, in succession, from the earliest time, and of forming from them a theory, if far from perfect, much less exceptionable than any that had preceded it; and which, when matured, superseded them, and became the reigning doctrine over all Europe for more than half a century. Drelincourt, who had long been professor of the theory of medicine, dying in 1701, the university of Leyden seized the opportunity this event afforded them of attaching him further to that place, by placing him in the vacant chair. This they were prompted to by gratitude as well as by prudence; Boerhaave having refused an advantageous offer of settling at the Hague, and though in no public office or capacity, he had already acquired a considerable reputation, and drawn a great many foreigners to Leyden, to hear his lectures in chemistry. On the occasion of this promotion he read his "Oratio de commendando studio Hippocratico." In Hippocrates, he particularly admired the correctness of his descriptions and histories of diseases, his patience in attending to the indications of nature, or the constitution, to which, with little interference, he frequently committed the cure of the disease, and his honest and sincere account of the termination of the disease, whether in health or death. In this he has not been always followed by writers of cases. In 1703, he was invited to accept a professor's chair at Groningen; but as he had refused, when much less known, an establishment at the Hague, he had no difficulty, now that his fame was more extended, and pupils were flocking to him from all parts, in rejecting this offer. The university at Leyden thought it necessary to reward this fresh proof of his attachment to the country by augmenting his salary. About this time he delivered his "Oratio de usu ratiocinii mechanici in medicina." These compositions were all published; and as they were drawn up and polished with care, they doubtless contributed in extending the fame of our professor over Europe. On the death of Peter Hotton, curator of the university garden, in 1709, he was appointed his successor, and made professor of botany. He now read his "Oratio qua repurgatæ medicinæ facilis asseritur simplicitas;" shewing that the knowledge of medicine would be easiest obtained by avoiding hypotheses, and attending to facts and observations; and that diseases would be more certainly cured by using only a few choice and simple medicines, than by the heterogeneous compositions then in vogue. He now, in addition to his other studies, employed himself sedulously in acquiring a more extended knowledge of plants; and this continued to be his amusement and delight to the end of his life. "Often have I seen," Haller says, "the good old man, moving slowly along the garden, at a very early hour in the morning, attending to the culture of the numerous exotics he had introduced there, classing and arranging them for his lectures." One year only after being appointed professor in botany, he published "Index plantarum quæ in horto Lugduno Batavo reperiuntur," 8vo. This work was re-published by him in 1720, much enlarged and improved, including a history of the garden, 2 vols. 8vo. In 1709, appeared his "Aphorismi de cognoscendis et curandis morbis," 8vo.; "aureus in summa brevitate libellus," Haller says. A work universally read and admired, on which baron Van Swieten, his illustrious pupil, who had attended his instructions for near twenty years, published his Commentaries, in 1742, extending it to five volumes in 4to. About the same time he published his "Institutiones rei medicæ in usus annuæ exercitationis domesticæ," 8vo. These two works, the one treating of the history and cure of diseases, the other of the physiology of the human body, improved and enlarged at different times by the author, have passed through numerous editions, and have been printed in every country, and translated into every language in Europe. Schulten says, there is a version of them also in the Arabic. Boerhaave was now in the zenith of his reputation, and had such a confluence of students from all parts of the world, as never probably before occurred to any one professor. He gave lectures on the theory of medicine, in botany, and in chemistry, and delivered them with such clearness and precision, as to fill his pupils with equal astonishment and delight. Haller, who was two years under his tuition, speaks of him with enthusiasm. "Vix sui parem habuit." We have hardly since seen, and perhaps may never again see his equal. In 1714, he was made rector of the university. On laying down this office at the end of the year, he read his discourse "De comparando certo in physicis." It is only to be acquired, he says, by experiment, and by a careful and minute examination of natural objects. Bidloo dying at this time, he was advanced to the chair of professor in the practice of medicine; and on the death of Le Mort, in 1718, he was made professor of chemistry. He was now at the head of every branch of medicine; and his pupils were become so numerous, Dr. Maty says, that Leyden was scarcely sufficiently capacious to contain them. In addition to these numerous vocations, he was frequently consulted, in cases of difficulty and danger, by physicians in all parts of the world.

With these advantages, it will not excite surprise, that his wealth should accumulate and become extremely abundant. As his diet was frugal and sparing, and he was plain in his apparel, he has been accused of being too parsimonious; but it should be considered, that attached as he was to science, and immured in business of such variety and magnitude, he had no time for expence or luxury, except in what regarded the improvement of science. In procuring rare and valuable books, and in collecting plants from distant countries for his garden, he spared, we are told, no expence.

In 1718, Boerhaave had published "De Chemia, suos errores expurgante," which was all he proposed giving on that subject; but some of his pupils having at the instigation, he says, of the booksellers, ventured to print, in his

name, transcripts of his lectures, so incorrectly taken as to materially injure his fame, to vindicate himself from the disgrace this might bring upon him, he found himself under the necessity of preparing his lectures for the press; and, in 1732, he published them under the title of, "Elementa Chemiæ, quæ anniversario labore docuit, in publicis privatisque scholis, Hermannus Boerhaave," 2 vols. 4to. The work is dedicated by a most affectionate address to his brother James Boerhaave. The first volume contains the history and the theory of the art, and is furnished with numerous engravings and descriptions of furnaces, and other instruments of chemistry. The second contains the processes, or operationes chemicæ. In the first volume he gives a catalogue of all the works he had published, preceding it, with much modesty, with this declaration; "Sciasque, me nihil edidisse unquam, præter sequentia, quæ non absque verecundia recensenda puto." At the back of the title-page he says, "Ut certus sit lector, hunc librum a me editum prodire, propria manu adscribendum putavi; nec pro meo agnosco, ubi hæc adscriptio abest, I Boerhaave;" uniting, as his custom was, the H and the B.

The character of Boerhaave, as a chemist, is thus given by Macquer, in his Preliminary Discourse to his Dictionary of Chemistry. "Next to Stahl we place the immortal Boerhaave, though he excelled in a different way. This powerful genius, the honour of his country, of his profession, and of his age, threw light upon every subject which he treated. To the view which he took of chemistry, we owe the finest and most methodical analysis of the vegetable kingdom; his admirable treatises on air, on water, and on earth, and particularly on fire, which is an astonishing master-piece, is so complete, that the human understanding can scarcely make an addition to it." To his moral character his disciple Haller bears the following honourable testimony: "Some, though few, will rival him in erudition; his divine temper, kind to all, beneficent to foes and adversaries, detracting from no man's merits, and binding by favours his daily opponents, may, perhaps, never be paralleled." In his conversation he was easy and familiar, and in his demeanour grave and sober, but at the same time disposed to pleasantry, and occasionally indulging in good-humoured raillery; so that he was compared to the admirable Socrates, whose bust he is also said to have resembled in features. By his pupils, whom he regarded with the kindness of a parent, he was beloved and respected in a very high degree. Piety formed a distinguishing feature of his character; and devotion was his daily exercise.

As Boerhaave was of an athletic make, had accustomed himself to exercise on horseback, to spend much of his time in the open air, and to use a frugal and plain diet, he had been enabled thus far to endure the extreme fatigue of his professional labours, with only some occasional interruptions from illness; but being grown corpulent, and incapable of riding, his constitution began to be on the decline, so that, in 1729, he found it necessary to resign his offices of professor in chemistry and botany. The speech he made on this occasion, was published under the title of "Oratio cum cathedræ chemiæ et botanices valediceret," 4to. In this he recounts some of the most memorable occurrences of his life, and speaks with gratitude of the patronage and favours he had received from individuals, in enabling him to chuse his walk in life, as well as from the members of his own profession, who had admitted his improvements in the theory and practice of the arts he taught, with more kindness and less opposition than is usually given to innovators of any kind. This doubtless arose in part from the great learning and abilities he was known to possess, and from the high reputation he had thence acquired, demanding respect; and partly from his disposition, averse from contention, and thinking but modestly of his endowments. From whatever cause it might arise, there was never perhaps so great a revolution in any science brought about with so little opposition as was made to that produced by Boerhaave. He had before, viz. in 1728, been admitted foreign associate of the Royal Academy of Sciences in Paris; and in 1730, he was elected a fellow of the Royal Society in London. The same year he was again made rector of the university at Leyden. On quitting that office, he read his "Oratio de honore medici servitute," which was also published in 4to. In this he again insists on the necessity of attending to the method nature takes in curing diseases, or the manner in which they terminate spontaneously, as practised by Hippocrates. Though this secession from public employment procured him some respite from his labours, he still continued revising and correcting his original works. He also spent much of his time in revising the works of other writers, and published more correct editions than were before extant; as the "Opera Anatomica et Chirurgica And. Vesalii," fol.; Albinus contributed to this work; of Bellinus, "De urinis et pulsibus," 4to. 1730; of Prosper Alpinus, "De præsagienda vita et morte," 4to. 1733; Aretæus, "De causis, signisque morborum," fol. 1731; Luisinus, "De lue venerea," fol. 1728, and some other works. Still, however, he enjoyed ease and relaxation from the more fatiguing part of his business, and he passed the principal part of his time, during the remainder of his life, at his mansion, a small distance from Leyden, in domestic recreations, with his wife and daughter, to whom he was much attached. Here he had a garden well-stocked with every thing that could contribute to his pleasure, and here he amused himself with his violin, in which he was a proficient. Towards the end of the year 1737, he became sensibly affected with difficulty of breathing, and a sense of suffocation, which incommoded him, whether walking or lying down. This went on increasing; and a small time before his death, he perceived a strong pulsation on the right side of his neck, which he attributed to a polypous concretion in the aorta. No remedy being competent to combat this dreadful disease, he expired calmly, in the midst of his family, on the 23d of September 1738. He was buried in the church of St. Peter's at Leyden, where his fellow-citizens erected an elegant monument to his memory. The pedestal is of black marble, supporting an urn, decorated with emblematic figures, representing the four ages of man's life, and the sciences in which he excelled. On one face of the pedestal is a medallion with the head of Boerhaave, surrounded with suitable decorations, his seal hanging under it, on which is engraved his favourite motto, "Simplex sigillum veri," simplicity the seal of truth; and underneath, "Salutifero Boerhavii genio sacrum," sacred to the health-restoring genius of Boerhaave.

In the course of this sketch of the life of Boerhaave, his principal works have been noticed; for a more complete catalogue of them, see Haller's Bib. Med. Pract. Anatom. et Botan. and Eloy's Dict. Hist.

Boerhaave, Abraham Kaan, professor of medicine in the university of Petersburgh, was born at the Hague in 1715. He was the son of James Kaan, and of Margaret the daughter of Herman Boerhaave. After receiving a good classical education, he went to Leyden, where applying to the study of medicine, under the celebrated Albinus Gaubius, and other masters, he was admitted to the degree of doctor in 1738. He had before obtained an honorary medal from the university, for his discourse, "De gaudiis Alchemistarum;" though he was more particularly attached to anatomy, which he cultivated with great success. The year following he took the name of his uncle Boerhaave. In

1740 he went to Petersburgh, where his talents soon procured him the situation of professor in medicine in the university there, and of one of the members of the imperial academy. By Portal and Blumenbach, he is called archiater, or aulic counsellor, and first physician to the empress, confounding him with his brother, Herman Kaan B. who about the same time enjoyed that honour. In the course of a severe and tedious illness, from which he with difficulty recovered, he lost his hearing. This happened in 1749. He died in 1753. His works are, "Perspiratio dicta Hippocrati, per universum corpus anatomicè illustrata," Lugd. B. 1738, 12mo; in which he shews there is a constant inhalation or absorption, and an exhalation, or perspiration, carried on, not only on the surface of the body, but in all the principal cavities. "Impetum faciens dictum Hippocrati per corpus consentiens, philologicè et physiologicè illustratum," Lugd. Bat. 1745, 12mo. In this he treats of the action of the mind upon the body, by the means of the nerves; of the fabric and motion of the muscles; on the effects of opium, given to a dog, &c. He also gave the anatomy of an elephant, which he had an opportunity of dissecting, and of two monstrous infants, and a dissertation on what have been called, improperly he says, hermaphrodites; no real hermaphrodite having ever been produced. Haller. Bib. Anat. Portal. Bib. Chir.

BOERHAVIA, in *Botany*, (named by Vaillant in honour of the celebrated Boerhaave.) Lin. gen. 9. Schreb. 13. Reich. v. i. p. 6. Willden. 20. Jussieu 91.; a genus placed by most botanists in the class *Monandria Monogynia*, though in different species, there are from one to four stamens. Nat. Ord. *Aggregatæ—Nyctagenes*. Jussieu.

Gen. Char. *Cal.* oblong, tubular and angular, placed beneath the coroll, with a contracted, entire mouth, permanent. *Coroll.* monopetalous, bell-shaped, upright, obtusely five-cleft, plaited, fixed on the calyx. *Nect.* fleshy, subcylindric, with a mouth slightly toothed, surrounding the base of the germ. *Stam.* filaments one, two, three, or four, inserted on the margin of the nectary, between its teeth; capillary, near the bottom (within the calyx) more slender, upright, about the length of the corolla; anthers twin-globular. *Pist.* germ. roundish, pedicelled, the pedicel surrounded by the nectary; style thread-shaped, twisted, as long as the stamens; stigma capitate. *Pericarp.* none; calyx enlarged, closed, encrusting the seed. *Seed* one, oblong, obtuse, angular. *Observ.* It is nearly allied to Mirabilis. The toothlets of the nectary are sometimes triangular, very small, and sometimes obsolete.

Ess. Gen. Cha. *Cal.* small, entire. *Cor.* one-petalled, bell-shaped, plaited. *Seed* one, encrusted with the enlarged calyx.

Dahl has injudiciously abolished this genus, and placed its species with the Valerians. In the opinion of Willdenow, it belongs properly to the class *triandria*, and may readily be distinguished from valerian by its very entire calyx, so minute, as scarcely to be visible, without the assistance of a lens, on which account it appears to have been overlooked by Linnæus and La Marck. Professor Martyn, in his edition of Miller, has inadvertently given *Calyx* none, as part of its essential general character; though in the natural character translated from Schreber, he had properly assigned it one.

Species, 1. B. *erecta*, upright hogweed. "Stem erect, smooth; *Stamens* two." Jacq. and Miller. "Stem tetragonal, smooth, with viscous joints, and flowers in a corymbose panicle." Willden. Stem two feet high, sprinkled with very minute protuberances as fine as hairs. Leaves waved, ovate, acute, rough at the margin, growing by pairs on long petioles from the joints of the stem, which are placed at a considerable distance from each other. Corolls cylindric, white, with five reddish shades; segments acute, with small teeth interposed. Stigma capitate. Discovered by Dr. Houston at La Vera Cruz in 1731, and since found at the Society Isles. 2. B. *adscendens*. "Leaves oblong-ovate, somewhat fleshy; flowers panicled; peduncles two-flowered; stem ascending." Willden. Stem smooth, tetragonal; leaves petiolate, opposite, veined, entire, smooth; the young leaves and the margin and petioles of the older ones hairy; hairs jointed as in veronica aphylla; panicle terminal, spreading, naked; peduncles two-flowered, involved in membranaceous bractes; fruit club-shaped, rough with small tubercles. A native of Guinea. Willden. 3. B. *diffusa*. "Stem smooth and even, spreading; leaves ovate." Linn. "Stem round, pubescent; flowers in corymbose heads." Willden. Leaves white underneath; flowers purple, with one stamen. A native of the East and West Indies. Cultivated in the royal garden at Hampton Court 1690. Mr. Miller received seeds from Jamaica by Dr. Houston. 4. B. *hirsuta*. "Stem spreading, pubescent; leaves ovate, repand, or serpentine." Reich. "Stem roundish, hairy; flowers in heads." Willden. Stems a foot high; peduncles axillary, sustaining small close heads of scarlet diandrous flowers, which generally fall off in about half a day. A native of Jamaica. 5. B. *plumbaginea*. "Leaves subcordate, orbiculate-acute, pubescent beneath; flowers in umbels." Willden. Umbels axillar, on long peduncles; coroll of a pale rose colour; stamens three; fruit turbinate, striated, crowned at the apex with pedicelled tubercles. Willden. A native of Spain. 6. B. *scandens*. La Marc. Tab. 4. "Stem erect; flowers two-stamened; leaves cordate, acute." Linn. "Stem erect, flowers two-stamened, in umbels; leaves cordate." Willden. Stem shrubby, very stiff, smooth, with alternate branches; leaves smooth; umbels of six green flowers; involucre of five leaves. A native of the rocky coasts of Jamaica and other West India islands. Cultivated in 1691, in the royal garden at Hampton court. 7. B. *excelsa*. "Stem erect; lower leaves cordate-ovate, upper ones ovate, flowers with three stamens in umbels." It resembles the scandens, but differs from it in its taller stem, in its upper ovate leaves, in its doubly larger purple flowers, and in the number of its stamens. Native place unknown. Described by Willdenow from a living plant. 8. B. *repanda*. "Stem erect; leaves cordate, repando sinuate; flowers in umbels, with three stamens." Willden. Resembles the scandens, but differs from it in its herbaceous stem and opposite branches and peduncles. A native of India and China. 9. B. *chærophilloides*. (Valeriana Chærophylloides. Smith Ic. ined. fasc. 3.) "Leaves bipinnatifid, toothed; flowers with three stamens in umbels." Willden. It has entirely the habit of a Boerhavia, and agrees in all the generic characters excepting only the style which is trifid. 10. B. *repens*. "Stem creeping." Linn. Native of Nubia, between Mocho and Tangos. 11. B. *angustifolia*. "Leaves linear, acute." Linn. Native place unknown. 12. B. *tetrandra*. Stem creeping; flowers with four stamens. Forst. Prod. 2. Native of the Society Isles, found by Forster in the island of Huaheine 1774.

These are all the species in Willdenow's edition of the Sp. Pl. La Marck (Illust.) has made the hirsuta and the repens the same as the diffusa, and appears to have been unacquainted with the adscendens, plumbaginea, excelsa, repanda, chærophylloides, angustifolia, and tetrandra; but has inserted two others, which as far as can be determined from their specific characters, seem to be distinct species. B. *paniculata*. "Stem erect; leaves ovate, acute, panicle naked, filiform, very viscous." A native of South America. B. *tuberosa*. "Stem erect, shrubby; root tuberose, esculent." A native of Peru. The following may possibly be the hirsuta, though he unites that species with the diffusa. B. *obtusifolia*. "Stem procumbent, spreading, viscidly pubescent;

cent; leaves ovate, obtuſe; umbels ſmall, ſomewhat in heads, lateral." A native of South America.

Propagation and Culture. None but the firſt, third, fourth, and ſixth, have been cultivated in England. They will not thrive in the open air, but muſt be raiſed from ſeeds, and treated like other tender exotic plants. The firſt three are annual, and when they grow too tall to remain under a common frame, may be planted in a warm border, where, if the ſeaſon prove favourable, they ripen their ſeeds; but a plant or two ſhould always be placed in the ſtove, to enſure a ſucceſſion of ſeeds. The fourth, which is perennial, may be preſerved in a warm ſtove two or three years. See Martyn's Miller.

BOERNÆR, Frederic, in *Biography*, profeſſor in medicine at the univerſity of Wittemburg, in Saxony, and an active member of the Acad. Nat. Curioſ. received his education at Leipſic, where he was born, June 17, 1723. He publiſhed ſeveral diſſertations on medical ſubjects, but his principal work is "Noctes guelphicæ, ſive opuſcula medico-literaria," Roſtock, 1755, 8vo. He died June 1761. Eloy. Dict. Hiſt.

BOERNERIANUS *Codex*, in *Biblical Hiſtory*, a MS. of part of the N. T. noted G, in the ſecond part of Wetſtein's N.T. It belonged to Dr. C. F. Boerner, was collated by Kuſter, and deſcribed in the preface to his edition of Mill's Greek Teſtament. It contains the epiſtles of St. Paul, that to the Hebrews excepted, which was formerly rejected by the church of Rome; it is written in Greek and Latin, according to one of thoſe verſions, which were in uſe before the time of Jerom. The Latin is interlined between the Greek, written over the text, of which it is a tranſlation. Stemmler ſuppoſes that the Latin was written ſince the Greek; but profeſſor Matthäi, who publiſhed this MS. at Meiſſen in Saxony in 1791, ſuggeſts that an uniformity in the hand-writing, and a ſimilarity in the colour of the ink evince, that both the Greek and Latin texts proceeded from the ſame tranſcriber. That it is an ancient MS. appears, ſays Michaelis, from the form of the characters, and the want of accents and marks of aſpiration. It ſeems to have been written in an age when the tranſition was making from the uncial to the ſmall characters; and from the correſpondence of the letters *r*, *s*, and *t*, in the Latin tranſlation, to that form which is found in the Anglo-Saxon alphabet, it is inferred, that this MS. was written in the Weſt of Europe, and probably between the 8th and 12th centuries. This MS. is preſerved at preſent in the electoral library at Dreſden: and a copy of it is kept in the library of Trinity College, Cambridge, among the books and MSS. that were left by Dr. Bentley. Michaelis on the N. T. by Marſh, vol. ii. and iii.

BOERO, in *Geography*. See Burro.

BOESCHOT, a town of Brabant, on the river Nethe; 12 miles N. E. of Malines.

BOESEROENS, or Budgeroons, three ſmall uninhabited iſlets of the Eaſt Indies, ſituated in the ſtrait that lies between the iſland Saleyer and the point of Celebes, called Laſſem. Theſe three iſlands almoſt block up the paſſage between the ſouthern part of Celebes and the northern part of Saleyer, the whole ſpace between which is about a league and a half. The ſtrait is paſſed between the ſouthernmoſt and middlemoſt, or between the latter, and the northernmoſt of the Budgeroons. This one of the moſt dangerous parts of the navigation for ſhips ſailing to or from the Moluccas, or ſpice iſlands; and it cannot be avoided without going round to the ſouth of Saleyer, which is a much more dangerous route, on account of the great number of ſhoals and ſunken rocks, which abound there, and are not accurately laid down in the charts.

BOESIPPO. See Bæsippo.

BOETHICUS, in *Entomology*, a ſpecies of Hesperia, (Pleb. Rur. Linn.) that inhabits India. The wings are tailed, bluiſh-brown, pale aſh colour beneath, and undulated with whitiſh; a double ocellar ſpot in the anal angle.

BOETHIUS, Anicius Manlius Torquatus Severinus, in *Biography*, deſcended from one of the moſt illuſtrious conſular families of Rome, lived in the time of the emperor Zeno, near the end of the 5th century. He was born at Rome about 470, the ſame year with Martianus Capella, another Roman writer on muſic. He is ſaid to have ſpent 18 years in the ſchools of Athens, purſuing the ſtudy of philoſophy under Proclus; others, however, have queſtioned this fact, and it has generally been allowed, that the term of 18 years is too long. Nevertheleſs, his viſit to Athens is juſtified by much internal evidence, adduced by Brucker, (Hiſt. Crit. Philoſ. t. iii. p. 524—527.) and by an expreſſion, though vague and ambiguous, of his friend Caſſiodorus, (Var. i. 45.) "longé poſitas Athenas introiſti." It is certain, that the erudition of the Latin language was inſufficient to ſatiate his curioſity, and that he devoted much of his time and attention to the ſtudy of Grecian ſcience and letters. From a letter of Caſſiodorus, written in the name of Theodoric, it appears that he had the honour of introducing to the Romans in their own language, the muſic of Pythagoras, the aſtronomy of Ptolemy, the arithmetic of Nicomachus, the geometry of Euclid, the logic of Ariſtotle, and the mechanics of Archimedes. He alone was eſteemed capable of deſcribing the wonders of art, a ſun-dial, a water-clock, and a ſphere which repreſented the motions of the planets. He commented upon parts of Ariſtotle, Cicero, and Porphyry; and from the commendations which he beſtows upon the latter, as the beſt interpreter of the former, he ſeems to have united the Platonic with the Ariſtotelian doctrine. Boethius ſeems to have been the firſt who applied ſcholaſtic philoſophy to the ſervice of Chriſtian theology; and he employed himſelf in defending the orthodox creed againſt the Eutychian, Arian, and Neſtorian hereſies, in a treatiſe "De Unitate et Uno." In civil life he attained to peculiar honours; as he was conſul in 487, and alſo in 510; and he was alſo created patrician, and advanced to the poſt of maſter of the offices. He married the daughter of his friend, the patrician Symmachus, and he enjoyed the peculiar ſatisfaction of ſeeing his two ſons elevated to the conſulate together in 522. Few perſons paſſed through life with a greater ſhare of outward reſpect and honour; and few could be more diſtinguiſhed by the teſtimonies that were given to his benevolence and liberality, his virtue and patriotiſm, as well as to his ſingular talents and learning. His own aſſeveration claims our aſſent, that he had reluctantly obeyed the divine Plato, who enjoined every virtuous citizen to reſcue the ſtate from the uſurpation of ignorance and vice. For the integrity of his public conduct he appeals to the memory of his country. His authority had reſtrained the pride and oppreſſion of the royal officers; he had always pitied and often relieved, the diſtreſs of the provincials, whoſe fortunes were exhauſted by public and private rapine; and he alone had the courage to oppoſe the tyranny of the Barbarians, elated by conqueſt, excited by avarice, and as he complains, encouraged by impunity. In theſe honourable conteſts, his ſpirit ſoared above the conſideration of perſonal danger, and perhaps of prudence. In addition to his other learned labours, he had formed a deſign of tranſlating all the works of Plato and Ariſtotle into Latin; but was prevented from executing his purpoſe by a premature death. Having for ſome years enjoyed the favour of Theodoric, the Gothic king of Italy, he was at length ſuſpected of being hoſtile to

his government, and of concurring with others, and particularly with Albinus, who was accuſed and convicted on the preſumption of *hoping*, as it was ſaid, the liberty of Rome. "If Albinus be criminal," exclaimed Boethius in the preſence of the king, "the ſenate and myſelf are guilty of the ſame crime. If we are innocent, Albinus is equally entitled to the protection of the laws." The advocate of Albinus was ſoon involved in the danger and perhaps the guilt of his client; their ſignature, which they aſſerted to be a forgery, was affixed to the original addreſs, inviting the emperor Juſtin to deliver Italy from the Goths; and three witneſſes of honourable rank, but probably of infamous character, atteſted the treaſonable deſigns of the Roman patrician. Upon this kind of evidence, Boethius was committed to cuſtody, and rigorouſly confined in the tower of Pavia; and a ſervile ſenate, at the diſtance of 500 miles, pronounced a ſentence of confiſcation and death againſt the moſt illuſtrious of its members. During his confinement, he compoſed his treatiſe "De conſolatione philoſophiæ," mentioned in the ſequel of this article; and at length the executioners of Theodoric's mandate fulfilled the ſavage commiſſion with which they had been entruſted, or, perhaps, even exceeded it, by the mode of putting him to death. Some ſay that he was beheaded; but others relate, that a ſtrong cord was faſtened round his head, and forcibly tightened, till his eyes almoſt ſtarted from their ſocket; and he was then beaten with clubs till he expired. This event happened, according to ſome, in the year 526, but according to others in 524. Boethius, in his laſt hours, derived ſome comfort from the ſafety of his wife, of his two ſons, and of his father-in-law, the venerable Symmachus. But Symmachus, perhaps indiſcreet in the mode of teſtifying his grief, was ſometime after dragged in chains from Rome to the palace of Ravenna, and there put to death, A. D. 525. Theodoric, it is ſaid, experienced the bitterneſs of ſelf-reproach, and the anguiſh of an unavailing repentance for the murder of theſe two illuſtrious ſenators, Boethius and Symmachus. His daughter Amalaſuntha is ſaid to have reſtored to the ſons of Boethius the confiſcated eſtates of their father.

His celebrated tract on muſic, divided into five books, was firſt printed in black letter, with his treatiſes on arithmetic and geometry, at Venice, 1499. It is remarkable, that in this copy the Greek of the famous *ſenatus conſultum*, againſt Timotheus at Lacedæmon, is omitted; though it was afterwards found in a beautiful MS. of Boethius, *De muſica*, 15 B. IX. of the 11th century, in the Britiſh Muſeum, where the infamous chromatic (χρωματος) is ſaid to have been ſubſtituted by that muſician to their grave and ſimple enharmonic (εναρμονιον), in the ſame manner as it is printed in the Oxford edit. of Aratus. (See Diſſert. on the Muſ. of the Ancients, p. 27.)

It ſeems neceſſary here to give ſome account of this famous treatiſe on muſic by Boethius, which, to read, was long thought neceſſary to the obtaining of a muſical degree in our univerſities; and which, with great parade, has been ſo frequently praiſed, quoted, and pronounced, by writers on that art, to be of the greateſt importance to every muſician, yet contains nothing but matters of mere ſpeculation and theory, tranſlated from Greek writers of higher antiquity; which if neceſſary to be known at this time, would be more profitably ſtudied in the original; but the theory of every art being vain and uſeleſs, unleſs it guide and facilitate practice, the definitions, calculations, and reveries of Boethius, are no more uſeful or eſſential to a modern muſician than Newton's *Principia* to a dancer.

In the proemium, or introduction to his firſt book, "De Muſica," he treats of the *morality* of muſic, and gives us all the old ſtories concerning its miraculous powers of exciting virtue, repreſſing vice, curing diſeaſes, &c. And in this book we find whence Zarlino, and all the Italian writers on muſic, down to Padre Martini, drew their extenſive diviſions of muſic into *mundane*, *human*, and *inſtrumental*. For Boethius ſays, "Tres eſſe Muſicas," lib. i. cap. 2. So had Ariſt. Quintilianus informed us, long before the birth of Boethius. And as far as we are able to divine at preſent concerning theſe diſtinctions, the ancients meant by *mundane* muſic, the muſic of the ſpheres. By human, or humane muſic, the perfect organization of our frame, and the union of ſoul and body. By the laſt only, the inſtrumental, we are brought to real muſic, by the grateful production and union of tuneful ſounds.

Then we have definitions, ſuch as are given in Euclid, and all the Greek writers, on harmonics and ſpeculative muſic in Meibomius. After which, we have the doctrines of proportion and ratios, inſtituted by Pythagoras, who would not truſt to the various and fallacious judgment of the ſenſes, but had recourſe to reaſon and calculation to ſettle his doubts. The account of the diſcoveries and harmonial laws eſtabliſhed by Pythagoras, not only inſerted in Boethius, but all ſubſequent writers, is taken from Nicomachus, one of the ſeven Greek writers on muſic in Meibomius. In the ſame book, we have a very ſuperficial and unſatisfactory account of the genera. But we are indulged with ſeveral chapters on the muſic of the ſpheres from "Cicero de Repub." lib. vi. where the ſuppoſed analogy between the planets and the ſeptenary, or ſeven ſounds in muſic, is aſſerted.

At the cloſe of this book, chap. xxxiv. Boethius eſtimates theory and ſpeculation far above practice in muſic. But what, we may aſk, is the uſe to the world of ſuch a theory as he deſcribes, without practice? Or, indeed, practice, without the ſupport of what is now underſtood by theory? The ſpeculative theoriſts, confined to meditation and experiments in harmonics, talk of muſic without hearing it; and the mere practician hears it without underſtanding it. Boethius allows him only to be a muſician who can examine, judge, and give reaſons for what is done. Here we have the origin of the verſes aſcribed to Guido:

Muſicorum et cantorum,
Magna eſt diſtantia, &c.

The whole ſecond book is relative to the diſpute between the Pythagoreans and Ariſtoxenians, which is not yet ſettled, about dividing the ſcale, whether by the ear, or by numbers. All the muſicians in Europe are now diſputing whether we ſhould temper our ſcales on fixed inſtruments, or adopt the triple progreſſion of Pythagoras, and tune by perfect 5ths. See TRIPLE PROGRESSION, and TEMPERAMENT. We have here the tone-major and tone-minor to diſcuſs; which we talk about, but never feel or think of the diſtinction in our modulation or performance. The *apotome*, *comma*, and *limma*, are left for the amuſement of ſpeculative harmoniſts to talk about, and for muſicians to practiſe with their ears and fingers, *ſans y penſer*.

In the third book, Boethius continues his controverſy with the Ariſtoxenians, and proves what has been long ſettled, that there is no ſuch thing in muſic as a literal *half-note*. The octave is ſaid to contain five tones and two ſemitones; and in the temperament of equal participation, the twelve ſemitones of the octave muſt be nearly equal.

In book iv. the ſubject is purſued of ſplitting of tones; for the ancients could "divide and ſubdivide a tone from ſouth to ſouth-weſt ſide."

We were very much diſappointed formerly at the non-performance of a promiſe made, book v. at chap. 3. the title of which is "Muſicarum per Græcas ac Latinas literas notarum nuncupatio." But Meibomius ſays the promiſe does not extend to the Roman notation in the Selden MS. at Oxford; nor had the Romans any notation of their own in

in the time of Boethius; and all the muſical terms he uſes are Greek, as were thoſe of Vitruvius.

Even the eulogiſts of Boethius confeſs, that his work is ſo purely theoretic, that in reading it we never think of practice. Let us leave it then to philoſophers who are content with imaginary ſounds. The mention of inſtruments, or of the voice as employed in ſinging, never occurs. No alluſions to the muſic of his time, but all is abſtract ſpeculation, tending doubtleſs to the perfection of the art, but ſeeming little connected with it. The harmony he talks of is more the *harmonia mundi* of Kepler, than that of Handel and Haydn. Guido ſaid, that Boethius's work was only fit for philoſophers. In the middle ages, ſo few underſtood Greek, that thoſe who were curious to know ſomething about the miraculous powers of that muſic, imagined that they ſhould find it in Boethius's tranſlation, who had been educated at Athens. Such ſpeculations are curious and amuſing, in moments of meditation, to ſcientific and inquiring minds; but practical muſicians, whether compoſers or performers, can afford little time for ſuch ſublime and ſpiritual amuſements. Nevertheleſs, he muſt be a dull and incurious profeſſor, who ſeeks not the reaſon of things, the principles of his art, and origin of ſounds. If he have a mathematical turn, let him read Galileo, Daniel Bartoli, D'Alembert, Holder, Rameau, Tartini, and Smith's harmonics. They are all intelligible, and lead to knowledge which he will be expected to poſſeſs; but for any thing uſeful that he can acquire from Boethius's ſpeculations, or from the Greek theoriſts, his prototypes, that will make him a better compoſer or performer, the caſe is hopeleſs. Yet there are, who, after allowing that "it was of ſo little uſe in practical muſic, that they never thought of it in reading Boethius;" yet returning afterwards to former prejudices, it is inſiſted on, that "he has communicated to the world ſuch a knowledge of the fundamental principles of the muſic of the ancients, as is abſolutely *neceſſary* to the right underſtanding of our own ſyſtem."

When we ſpeak of the inutility of Boethius's work on muſic to the muſical ſtudents of modern times, we preſume not to extend our cenſures further. The writings of this great and good man on other ſubjects have been too long held in reverence to be depreciated ſlightly. His moſt celebrated production was his ethic compoſition "De conſolatione philoſophiæ," and has always been admired both for the ſtyle and ſentiments. It is an imaginary conference between the author and philoſophy perſonified, who endeavours to conſole and ſoothe him in his afflictions. The topics of conſolation contained in this work, are deduced from the tenets of Plato, Zeno, and Ariſtotle, but without any notice of the ſources of conſolation which are peculiar to the Chriſtian ſyſtem. It is partly in proſe, and partly in verſe; and was tranſlated into Saxon by king Alfred, and illuſtrated with a commentary by Aſſer, biſhop of St. David's; and into Engliſh, by Chaucer and queen Elizabeth. It was alſo tranſlated into Engliſh verſe by John Walton, in 1410, of which tranſlation there is a correct manuſcript on parchment in the Britiſh Muſeum. Few books have been more popular, eſpecially in the middle ages, or have paſſed through a greater number of editions in almoſt all languages. It has been obſerved by Mr. Harris, in his "Hermes" that "with Boethius the Latin tongue, and the laſt remains of Roman dignity, may be ſaid to have ſunk in the weſtern world." To the ſame purpoſe, Gibbon ſays, "that the ſenator Boethius is the laſt of the Romans, whom Cato or Tully would have acknowledged for their countryman." Fabr. Bib. Lat. tom. ii. p. 146, &c. Le Clerc, Bib. Choiſ. t. xvi. p. 168—275. Burney's Hiſt. Muſ. vol. ii. p. 31, &c. Gibbon's Hiſt. Rom. Emp. vol. vii. p. 43, &c. Brucker's Hiſt. Phil. by Enfield, vol. ii. p. 313.

BOETTICHER, Gottlieb, a phyſician of eminence, and in conſiderable practice at Berlin during the early part of the laſt century, publiſhed various works on the theory and practice of medicine. The principal are, on the exiſtence of a nervous fluid, "De vera fluidi nervorum exiſtentia," Berlin, 1721, 4to.; "De morborum malignorum, imprimis peſtis et peſtilentiæ explicatio," 4to. 1713; this has been ſeveral times reprinted. He contends that the plague is contagious; and that the infecting effluvia may be retained, and conveyed in full vigour, in the clothes or bedding of the ſick, to diſtant countries; a doctrine that has been lately ſtrongly oppoſed. Pregnant women, affected with the plague, conſtantly part with the fruit of the womb before they die. Hypochondriac perſons, he thinks, are not ſuſceptible of the contagion. But in this he is probably miſtaken; as we know lunatics do not enjoy ſuch an exemption from contagious diſeaſes in this country. He recommends bleeding on the firſt attack of the fever, and then to have recourſe to ſudorifics. "De reſpiratione fœtus in utero," 4to, 1702. Haller Bib. Med. et Anat.

BŒUF, Le, in *Geography*, a place in the north-weſtern corner of Pennſylvania, at the head of the north branch of French creek, and 50 miles diſtant by water from fort Franklin, where this creek joins the Alleghany. The French fort of Le Bœuf, from whence the place has its name, lies about two miles eaſt from Small lake, which is on the north branch of French creek: and from Le Bœuf, is a portage of 14 miles northerly to Preſque iſle in lake Erie, where the French had another fort. N. lat. 42° 1′. W. long. 79° 53′ 20″.

Bœuf, in *Ornithology*, according to Salerne, the common name of the bulfinch (*loxia pyrrhula*) in the canton of Sologne. The troglodyte, *ſylvia troglodytes* of Latham, is likewiſe called by the ſame name (*bœuf*) in Switzerland.

Bœuf *de Marais*. The French call the common bittern (*ardea ſtellaris*), becauſe it frequents marſhes, and has a loud cry, and emits a ſort of roaring noiſe that has been compared to that of an ox or bull, by this name. "Il n'y a," ſays Belon, "bœuf qui pût crier ſi haut."

Bœuf *d'Afrique*, in *Zoology*. By this name ſome French writers diſtinguiſh the buffalo; the epithet is miſapplied, becauſe that animal is equally common in India, whence indeed, it is ſuppoſed, the African buffalo firſt originated.

Bœuf *a Boſſe*, ſynonymous with *biſon*. By ſome it is likewiſe called *bœuf des Illinois*.

Bœuf *Guerrir*. Under this denomination the French deſcribe a race of African oxen, which the Hottentots call *backleys*; the word *backley* in their language ſignifying war, to the purpoſes of which they are trained up, in the ſame manner as elephants are by the Indians. War oxen of this deſcription are inſtructed alſo to guard the herds of the common oxen.

Bœuf *de Mer*, in *Ichthyology*, is the name of the long-beaked ray, *raja oxyrinchus* of Linnæus.

Bœuf *de Mer*, in *Zoology*, the common French name for any of the Phocæ tribe of animals, correſponding with the general Engliſh name of *ſea-cow*.

BOFFRAND, Germain, in *Biography*, a celebrated French architect and engineer, was born at Nantes in 1667, and having been educated at Paris, he employed himſelf for ſome time in ſculpture during the winter, and ſtudied architecture in the ſummer. His talents at length engaged the attention and patronage of Hardouin-Manſart, an eminent architect, who obtained for him a place in the commiſſion for the royal buildings. In 1709, he became a member of the Royal

Royal Academy of Architecture, and was much employed at Paris, and by several German princes, in furnishing designs for various edifices. His style of building was grand and noble, and formed after the model of Palladio. He was likewise a skilful engineer, and constructed a great number of canals, sluices, bridges, and similar works. As architect to the general hospital of Paris, he gratuitously served the institution; and, as he was disinterested in his temper, he was lively and amusing in conversation; and he indulged his taste for literature by the composition of several pieces, adapted to the purpose of producing temporary gaiety and mirth, for the Italian comedy. His "Book of Architecture," with plates, was printed at Paris in 1745, folio; and contains an account of the general principles of the art, exemplified in his own works. In this work he has also introduced a curious memoir, describing the method of casting the bronze equestrian statue of Lewis XIV. He retained his gaiety of disposition to the age of 87 years, and died at Paris in 1755. Encycl. Hist. Gen. Biog.

BOFIN, Boffin, or Baffin *Lough*, in *Geography*, one of those large lakes in Ireland into which the river Shannon expands, situated between the counties of Roscommon and Leitrim.

BOG, derived from the Italian *buca*, a *hole*, or rather from the Belgic *boogen*, to *bend*, on account of its giving way when trod upon, in *Agriculture*, a quaggy sort of earth, generally met with in low situations, covered with coarse grasses, but of so little solidity as to be incapable of supporting the tread of heavy animals; caused by the dissolution, decay, and deposition of different vegetable and other substances, from the stagnation and detention of the water that oozes along on the clayey or other thin tenacious strata below, or which springs up through the fissures, or other openings of them. They are of different kinds, depths, and consistencies, according to the different circumstances of the case, and the nature of the situation of the ground on which they are formed, as well as that of the earthy material that enters into their composition. Dr. James Anderson, in his treatise on draining bogs and swampy grounds, remarks, that clay is a substance that strongly resists the entrance of water into it; but, when it is long drenched with water, it is in process of time, in some measure dissolved thereby, losing its original firmness of texture and consistence, and becoming a sort of semi-fluid mass, which is called bog. And as these bogs are sometimes covered with a surface of a particular kind of grass, with very matted roots, which is strong enough to bear a small weight without breaking, although it yields very much; it is in these circumstances denominated a *swaggle*.

But whatever be the nature of the bog, it is invariably occasioned by water being forced up through a bed of clay, as just described, and dissolving or softening a part thereof. A part is only mentioned, because, whatever may be the depth of the bog or swaggle, it generally has a partition of solid clay between it and the reservoir of water under it, whence it originally proceeds. For if this were not the case, and the quantity of water were considerable, it would meet with no sufficient resistance from the bog, and would of course, issue through it with violence, and carry the whole semi-fluid mass along with it. This would more inevitably be the case, if there was at first a crust at the bottom of the bog, and if that crust should ever be broken, especially if the quantity of water under it was very considerable. And as it is probable that, in many cases of this sort, the water slowly dilutes more and more of this under-crust, no doubt is entertained but that in the revolution of many ages, a great many irruptions of this kind may have happened; although they may not have been deemed of importance enough to have the history of them transmitted to posterity.

It has been remarked by Mr. King, in the Philosophical Transactions, No. 170, that the springs, with which Ireland abounds, are generally dry, or nearly dry in the summer time, and that grass and weeds grow thick about the places where they burst out. In the winter, he observes, they swell, run, soften, and loosen all the earth about them. The sward or scurf of the earth, which consists of the roots of grass, being lifted up and made fuzzy by the water, at that season (he has seen it lifted up a foot or two at the head of some springs), is dried in the spring, and does not fall together, but withers in a tuft, through which arises new grass, which is also lifted up the next winter. By this means the spring is more and more stopped, and the scurf grows thicker and thicker, till at first it makes the appearance which we call a quaking bog; and as it grows higher and drier, and the roots of the grass and other vegetables become more putrid, together with the mud and slime of the water, it acquires a blackness, and grows into that which we call a turf-bog.

It is, however, confessed, that there are quaking-bogs caused otherwise. When, it is observed, a stream or spring runs through a flat, the passage, if not kept open, fills with weeds in summer, trees fall across it and dam it up; then in winter the water stagnates further every year, till the whole flat is covered. Afterwards a coarser kind of grass shoots up, peculiar to these bogs; this grass grows in tufts, its roots consolidate together, and its height increases every year, insomuch that he has seen it as tall as a man. This grass rots in winter, and falls on the tufts, and with it the seed, which springs up the next year; and so continues making an annual addition. Sometimes the tops of the flags and grass are interwoven on the surface of the water, and this becomes by degrees thicker till it lies like a cover on it; then herbs take root in it, and by the matting of their roots, it becomes very strong, so as to bear a man. He has gone on bogs which would rise before and behind, and sink where he stood to a considerable depth, under which was clear water.

It is further observed, that Ireland abounds in moss more than any other country; this moss is of divers kinds, and that which grows in bogs is very remarkable. The light spongy turf is nothing but a congeries of the threads of this moss, before it be sufficiently rotten; the turf then looks white, and is light. It has been seen in such quantities, and so tough, that the turf-spades could not cut it. In the north of Ireland, they denominate it old-wives tow, being not much unlike flax. The turf-holes in time grow up with it again; and all the little gutters in bogs are generally filled with it. To this he chiefly imputes the red or turf bog; and from the same cause even the hardened turf, when broken, is stringy, though there plainly appear in it parts of other vegetables; and he is almost, from some observations, tempted to believe, that the seed of this bog-moss begets heath, when it falls on dry and parched ground. However, the moss is so fuzzy and quick-growing a vegetable, that it greatly stops the spring, and contributes to thicken the scurf, especially in red bogs, where he remembers to have observed this most particularly. The situations of land may sometimes contribute to the formation of bogs in it, as flat spots of ground lower than the level of an adjoining river or lake; for when that part is filled up by the slime and earth brought from the surrounding grounds, and the rotten plants and animals, which are buried in it, have choked it up, it will become a bog; and then the water will continue to flow into it from the river or lake, especially when either of these is swelled by a fall of rain or melting of snow. These waters may also sometimes have

this effect, without a communication above ground, by ſoaking through a ſandy or gravelly ſoil. And another cauſe that may contribute to the production of bogs, may be the fall of a number of trees, which, by occaſioning a ſtagnation in the water brought down from higher grounds, may cauſe the depoſition of much earthy vegetable, and other materials, and conſequently the production of boggy appearances in the places where ſuch obſtructions are met with.

Bogs are diſcriminated by different titles, according to the nature of the circumſtances under which they occur; as *peat-bogs*, *quaking-bogs*, *ſpring-bogs*, and *turf-bogs*. The firſt being that ſort of bog which is principally compoſed of peat-earth. The ſecond ſuch a kind of bog as, when trodden upon, affords an elaſtic kind of motion, or ſhaking under the foot. The third is ſuch a bog as ariſes from the oozing or ſpringing up of water through the ſtiff ſtrata of materials on which it is formed. Mr. Elkington, the celebrated drainer, makes two claſſes of this ſort of bog; the firſt of which is diſtinguiſhed by the ſprings riſing out of the adjoining higher grounds, in a regular line, along the upper ſide of the wet ſurface; while, in the latter, the number of ſprings that appear are not confined to one regular direction along the upper ſide, but burſt out promiſcuouſly over the whole ſurface, eſpecially towards the lower ſide, forming quagmires all round, that ſhake and bend under the feet like a ſuſpended cloth, over which it is dangerous for the lighteſt cattle to paſs, and which ſhew themſelves at a diſtance by the verdure of the graſs, which the quags or ſpots immediately round the ſprings produce. The laſt is a ſort of bog conſtituted of materials which partake of the nature of turf.

Wherever bogs are met with, draining is unqueſtionably the firſt ſtep to be taken towards their improvement. For the full accompliſhment of this purpoſe, Mr. Elkington's mode may in many caſes be ſucceſsfully reſorted to, and with great and ſudden effect; though the improver ſhould not be too ſanguine in his expectations, or imagine that it is in every caſe an eaſy operation to free this ſort of land from an exceſs of moiſture. There are probably ſome bogs which cannot, without great difficulty, be drained at all; and others that would coſt the value of the land, in drains and machinery, to effect ſuch improvements in them. But notwithſtanding unſucceſsful trials may ſometimes be made, the drainer ought not to be totally diſcouraged from further attempts, where there is a tolerable proſpect of ſucceeding in the buſineſs at laſt; as the caſes are no doubt very numerous, in which this ſort of land may be effectually drained at an eaſy expence, and thereby brought from a ſtate of inutility to yield conſiderable profit to the owners and the public. See DRAINING *of Boggy Lands*.

It is obſerved in the appendix to Mr. Johnſton's account of Mr. Elkington's mode of draining, that in the improving of bogs, after their being drained, as the great object is to get the ground brought to ſuch a ſtate, as to be fit for being laid down with graſs ſeeds, when it may be conſidered in ſuch a ſtate of improvement, that any ſubſequent crops will require no more than ordinary management to cultivate them; the firſt thing to be done, where they are extenſive, is to have them divided into proper incloſures by open ditches, by which means much ſurface water may be carried off, as well as by properly attending to the formation of the ridges and furrows in ploughing, and giving them a direction towards the open ditches, by which the rain or ſurface water may be diſcharged as it falls; and after this has been effected, to have the ſurface well levelled by means of the ſpade, as being in moſt caſes more effectual than by the plough. The better ſorts of the materials thus removed may be mixed up with lime or other ſubſtances, and ſet upon the land; while those of the coarſer kinds are made uſe of to fill up the inequalities on the ſurface. Paring and burning, where there is much coarſe vegetable matter, may be practiſed with advantage. In order to this, whatever earth remains unemployed, in filling up hollows, ſhould be burnt, together with that taken out of the ditches, unleſs the latter has been already carried off for fuel. The greater quantity of aſhes there is, the greater will be the improvement of the ſoil itſelf, and the more will the earth be benefited. The aſhes, after being well incorporated with the ſoil by means of light or ſuperficial ploughing, frequently ſo enrich it, as to produce excellent crops for two years or more. The effects of the aſhes and burnt materials have been ſaid, in ſome caſes, to be increaſed by the addition of a little lime. When the turfs have been reduced to aſhes, ſpread over the ſurface of the ground, and turned in with a little furrow, turnips or potatoes ought to be the firſt crop. If the former, they may be ſown broad-caſt, and fed off by ſheep, by the dung and urine of which the ſoil will be greatly benefited, as well as by the refuſe of the plants, and the conſolidation produced by their treading upon it. It will then be in a ſtate for a crop of oats or barley, which ſhould be ſown with graſs-ſeeds, and well rolled down. The ploughing after the turnip crop, thus eaten off, ſhould be very ſlight, in order not to bury the enriching materials too deep; in which view oats ought to be preferred to barley. If the ſoil be full of the roots of ruſhes, weeds, and coarſe plants, a ſummer fallow may be neceſſary before any crop be taken: and when the aſhes have been made in a particular part of the field, they may be ſpread over the ſurface before the ſeed furrow is given, and the roots and tough clods, after being collected and burnt, may be ſpread along with them.

If the bog be very ſoft and deep of peat, ſo as not to admit horſes for ploughing the firſt year, a crop of turnips broad-caſt may be got by ſowing the ſeed among the ſpread aſhes, harrowing it in with a light harrow and roller drawn by men. This crop, being eat off as above, will leave the land the enſuing year ſo much conſolidated as to admit the plough.

When the ſurface has not been pared and burnt, fallowing for two years may be neceſſary to reduce the ſoil to a proper mould, in the laſt ſtage of which the lime or other manure muſt be applied. In this caſe two white crops, with an intervening one of turnips, potatoes, &c. may be taken before the graſs-ſeeds are ſown.

Boggy ſoil, of whatever kind, after being once broken up and pulveriſed by tillage and a courſe of fallow, ſhould not be over-cropped before being laid down in graſs; and, when brought into a good ſward of graſs, ſhould not be too ſoon broken up again, but continue ſo, buſh-harrowing and top-dreſſing it when the herbage begins to moſs. Repeated rolling is alſo neceſſary in ſuch ſoils.

It is probably a better practice to feed ſheep the firſt and ſecond years of the graſs than to cut it for hay, as it cauſes the roots of the graſs to ſtrike more horizontally through the ſoil, and more cloſely to cover the ſurface. With this view a greater proportion of white and yellow clover, and other ſhort graſs ſeeds, ſhould be ſown.

In the manuring of ſoft boggy lands ſome caution is neceſſary; for, though the ploughings, previouſly to the application of the dung, may be made deep with advantage, the ſubſequent furrows ſhould be very ſuperficial, and the dung regularly and uniformly blended with the ſoil; for, when this is not the caſe, it is apt to ſink down too much, and be of little utility. The ſame thing takes place with reſpect to lime; and even when marle is buried too deep it is ſaid to loſe its power as a manure.

On ſoft boggy ground, merely intended for paſture, nothing will produce a more rapid improvement than the application of a thin covering of marle. In order to this, the directions already given, with reſpect to paring and burning, ſhould be obſerved.

Marle, which is often found under a gravel or clay, may alſo be of great ſervice: but if a loamy earth be near at hand, it will, perhaps, be leſs expenſive to the farmer to bring ſuch earth to cover the bog, than it will be to dig up the clay. But of whatever kind the earth be which is laid upon the bog, the quantity ſhould always be ſufficient to cover its whole ſurface four, five, or ſix inches deep, according to the ſtiffneſs of the ſoil ſo brought.

Sea-ſand, as being frequently mixed with ſhells, is well ſuited to this purpoſe, if the boggy ground be ſituated near the ſea, ſo that it can be eaſily procured. The great weight of theſe materials tends equally to conſolidate the bog, and preſs out the moiſture from the ſpongy peaty earth; therefore the thicker they are applied the better. A ſlight ſprinkling of lime over it will add to the effect, and bring up much white clover and other ſweet graſſes.

The moſt barren earths or ſoils, when uſed in this way, may have good effects; but lime-ſtone gravel, where it can be procured, is to be preferred to all others. After the land has been treated in this manner, and lain ſome years in paſture, it may be broken up for tillage, and crops of grain taken before being laid down with graſs-ſeeds. By ploughing, part of the natural ſoil will be turned up, and intimately mixed with the earth, &c. that has been laid upon it, and, if lime or dung be added, will together form a very fertile mould. When boggy grounds are much over-run with ruſhes, and other coarſe, ſour, aquatic plants, ſcarcely any thing tends more to the firſt part of its improvement than that of over-ſtocking it with different ſorts of cattle, as ſoon as ever it is ſufficiently ſolid to bear them with ſafety; care muſt, however, be taken not to put them on till it is quite firm, as if that be done they will not only poach the ſurface, but the coarſe herbage will remain without being eaten cloſely down. The practice of cutting the ruſhes frequently in their young and tender ſtate, is alſo of conſiderable utility. By theſe means alone a better kind of herbage is ſpeedily brought up, and much improvement produced.

Another conſiderable means of improving this ſort of land, where the ſituation is ſuch as to admit of it, or when it lies near the ſide of a large river or ſtream, of which, by means of proper dams and cuts, a command can be obtained, is that of floating it with water, a proceſs that, when judiciouſly managed, never fails to produce abundant crops of graſs. And that it is a mode of improvement well ſuited to this ſort of land, is evident from the effects that have been produced in different inſtances; and from the obſervations of Mr. Boſwell, that it requires more and longer watering than any ſandy or gravelly ſoil: the larger the body of water that can be brought upon it the better, its weight and ſtrength will greatly aſſiſt in compreſſing the ſoil, and deſtroying the roots of the weeds that grow upon it; neither can the water be kept too long upon it, eſpecially in the winter ſeaſon, immediately after the after-math is eaten; and the cloſer it is eaten the better. The manner of conducting the buſineſs of watering muſt be ſuited to the circumſtances of the particular caſes.

After being thus improved, it muſt next be determined to what laſting purpoſe it may be beſt applied. The too great moiſture of theſe ſoils, which always lie flat, renders them unfit for continued tillage, and their mould becomes ſo looſe by frequent ploughing, that it frequently does not afford ſufficient ſtability to the roots of corn. For this reaſon barley, oats, and rye do better here than wheat, which requires a firmer footing; but neither of them ſhould be ſowed thick, becauſe the fruitfulneſs of the ſoil will always make up in the ſize of the plants, what ſome might think wanting in their number. The moſt beneficial method of employing this ſort of land is, undoubtedly, that of converting it into meadow, becauſe, when thus prepared, and not injudiciouſly exhauſted by crops of corn, it will yield great quantities of excellent graſs. It is, however, uſual to begin with ſowing ſome kind of grain on this prepared ſurface, to indemnify the farmer by the plentiful crop which it generally yields; ſuch, indeed, as ſometimes defrays at once the whole expence of the improvement. In ſome caſes the moſt profitable method may be to ſow it in the autumn with rape, the leaves of which ſhading the ſurface in hot weather, and rotting in the winter, contribute greatly to mellow the earth; the ſtrong roots of this plant open the ſoil too, and its ſeed brings a great return when ſold for making oil. One or two ploughings after this will prepare it for a crop of wheat. After this is taken off, and the ſtubble turned down, white clover and graſs-ſeed ſhould be ſown, and the ground laid down for a laſting meadow; or if turnips be ſown, or cabbages planted in the autumn, theſe in the ſpring may be ſucceeded by barley, with which the graſs-ſeeds may be ſown.

In crude moory or black peat boggy improved lands, Mr. Marſhall remarks, that what is moſt deſirable is a crop that is ſown and reaped during the ſummer months, and which demands neither labour nor attendance in the humid ſeaſons of autumn, winter, or ſpring; and ſuch a crop is found in rape, which is luckily natural to the climate, and at the ſame time highly profitable. Trials with this may be made at but a trifling expence on a ſmall portion of the ground, the proof of which anſwering, it is obſerved, "is not whether the plant will thrive as herbage, but whether it will mature its ſeed on the given ſoil in the given ſituation."

After a recompence has been obtained by crops of this ſort, which may be repeated, as there is no danger of exhauſting ſuch deep ſoils, the foundation of more laſting profits is to be laid; which may be effected by ſowing graſs-ſeeds, with or over the rape crops, or after the ſtems have been drawn, according to ſeaſons and the circumſtances of the land, ſtocking, as directed above, till ſuch time as the ſurface becomes ſufficiently firm, and the ſoil has attained a ſuitable texture for mixed cultivation, which time may be much ſhortened by the application of foſſile ſubſtances of the calcareous kind in any period of the improvement.

When either through neceſſity, for want of other arable land, or out of choice, the farmer intends to continue ploughing his improved bogs, the ſurface muſt be raiſed in ridges, and the further management of it may be like that of moſt other ploughed grounds.

If a ſoil of this kind happens to be ſituated near a town, a greater profit may accrue from planting it with garden ſtuffs than from any ſort of grain, as beans, peas, cabbages, potatoes, turnips, carrots, &c. are found to thrive exceedingly well in earth of this kind.

Bog, *moving* or *migrating*. Theſe ſoft maſſes of earth have been ſometimes known to move out of their place. An inſtance of this there was in Ireland, in the year 1697, about Charleville in the county of Limerick. There was heard for ſome time a noiſe under ground like that of thunder at a great diſtance, or almoſt ſpent; and ſoon after this the earth of a large bog in the neighbourhood began to move, and a hill or riſing ſituated in the middle of it ſtood no longer above the level of the reſt, but ſunk flat. The bog not only moved itſelf, but carried with it the neighbouring paſture-

lands, though ſeparated by a large and deep ditch; the motion continued a conſiderable time, and the ſurface of the moving earth roſe into a ſort of waves, but without breaking up or burſting any where. The paſture-land roſe very high, and was carried on with the ſame motion till it reſted upon a neighbouring meadow, the whole ſurface of which it covered, remaining ſixteen feet deep upon its ſurface. The whole quantity of the bog was torn from its former ſeat, and left great gaps in the earth where it had joined, which threw up foul water, and very ſtinking vapours. Phil. Tranſ. N° 233. The whole country came in to ſee ſo ſtrange a ſight as this, for it continued moving a long time; but few gueſſed the true cauſe of it, which was this: a more than ordinary wet ſpring occaſioned the riſing of the bog to a great height in one part, and thence propagated itſelf through the whole bog; ſo that the hill in the midſt was undermined, and naturally ſunk flat; this and the more than ordinary weight of this large bog preſſi g upon the adjoining paſture-land, forced up its foundations, which were only a looſe ſand. This was puſhed on ſideways, where there was a deſcent from the bog, and at length having given the bog more room, all was quiet and remained in that ſtate. The bog was more than forty acres of ground.

Another inſtance of this kind occurred, in March 1745, at the bog of Addergoole, about a mile and a half from the town of Dunmore, in the county of Galway. In conſequence of a violent ſtorm, attended with a fall of rain, reſembling a water-ſpout, the turbary, which the turf-cutters had juſt left, containing about twelve acres, was put into motion, and floated till at laſt it ſubſided upon a piece of low paſture of near thirty acres, by the ſide of the river, where it ſpread and ſettled. The moving-bog choaked up the river, which conſequently overflowed the back grounds, and in a little time a lough or lake of near 55 acres covered the adjacent fields. A paſſage for the river was formed as ſpeedily as poſſible; but before it could be finiſhed, and the lake diſcharged, it was ſuppoſed to have covered 300 acres; however, in ſeven or eight days it gradually decreaſed to 50 or 60 acres, of which extent it continued. Iriſh Tranſactions, vol. ii. p. 4.

Bog, ancient *Hypanis*, in *Geography*, a river of Poland, which riſes in Podolia and joins the eſtuary of the Dnieper or Nieper, a little above Oczakow, about N. lat. 46° 32′. E. long. 32° 32′. This river ſeparates Poland and a portion of European Turkey from Ruſſia. By taking up the Ingul, the Sinucha, and the Guiloi, beſides other ſtreams in its courſe, it becomes a very conſiderable river.

Bog *bean*, in *Botany*. See Menyanthes.

Bog *berry*. See Vaccinium.

Bog *moſs*. See Splachnum.

Bog *buſh*. See Schoenus.

Bog *wood*. See Wood *ſubterraneous*.

Bog *ore*. See Iron.

BOGA, in *Ichthyology*, ſynonymous with *Bogue*, and *Sparus boops*.

BOGAERT, Martin Vanden, ſurnamed *Deſjardins*, in *Biography*, an eminent ſculptor, was born at Breda, in Holland, in 1640, and ſettling in early life at Paris, he became a member of the Royal Academy, at the age of 31 years. The firſt of his moſt conſiderable works was an equeſtrian ſtatue of Louis XIV. erected at Lyons in the place Bellecour. He alſo adorned the gate of the church of the Mazarin college with ſix groups of ſtone, repreſenting the evangeliſts and the Greek and Latin fathers of the church; and beſides many other works, the moſt diſtinguiſhed was the monument erected in the place of Victory, at the expence of marechal du Feuillade, on which the king, crowned by victory, is exhibited in a ſtanding poſture, inveſted with the regal ornaments, and having under his feet a cerberus, to denote his triumph on occaſion of the triple alliance. This group is 30 feet high, and was formed by a ſingle caſt, under the particular direction of Deſjardins. This artiſt died rich in 1694. Encycl.

BOGAHA, in *Botany* and *Mythology*, a tree held ſacred in Ceylon, on account of the imagined preference given by the deity Buddou to the ſhade of this tree above all others. Wherever it is found throughout the iſland, perſons are appointed to watch over it, and preſerve it from dirt or injury. It is held in the ſame eſtimation among the followers of Buddou, as the banyan tree is among the Brahmins. The Candians hold their great feſtival under the ſhade of a tree of this kind, which ſtands at Annarodgburro, an ancient city in the northern part of the king of Candy's dominions; and none but his own ſubjects are permitted to approach this ſanctuary. Tradition ſays, that the bogaha tree ſuddenly flew over from ſome diſtant country and planted itſelf in the ſpot where it now ſtands. It was intended as a ſhelter for the god Buddou, and under its branches he was wont to repoſe, while he ſojourned on earth. Near this hallowed ſpot 90 kings are interred, who all merited admiſſion into the regions of bliſs by the temples and images they conſtructed for Buddou. They are now ſent as good ſpirits to preſide over the ſafety of his followers, and protect them from being brought into ſubjection to Europeans; a calamity againſt which they continually pray. Around the tree are a number of huts, erected for the uſe of the devotees, who repair hither: and as every ſort of filth and dirt muſt be removed from the ſacred ſpot, people are retained for the purpoſe of continually ſweeping the approaches before the worſhippers, and to attend the prieſts during the performance of the ceremonies. Percival's Ceylon.

BOGANEU, in *Geography*, a town of Bohemia, in the circle of Chrudim; 6 miles S. of Chrudim.

BOGAR. See Bokhara.

BOGAROVSKOI, a town of Siberia, 136 miles N. of Tobolſk.

BOGAS, or Boghas, a ſmall town of Egypt, at the mouth of the Nile; 3 miles N. of Damietta. See Boghass.

BOGATOI, a town and diſtrict of Ruſſia, in the government of Kurſk, ſeated on the rivulet Penna, falling into the Pſol; 48 miles S.S.W. of Kurſk.

BOGAZI, a town of Aſiatic Turkey, in the country of Diarbekir, 50 miles W. of Diarbek.

Bogazi, ſignifying in the Turkiſh language a "canal," or "ſtrait," a name given by the Turks to two ſtraits, adjoining to the iſland of Samos; one, called Little Bogazi, and ſcarcely half a league broad, ſeparates Samos from the continent of Aſia; the other, called the Great Bogazi, and nearly two leagues broad, lies to the weſt, and ſeparates this iſland from the ſmall Fournis iſlands, ſo denominated, becauſe, at a diſtance, they appear like the roofs of ovens; they were anciently called "Corſeæ inſulæ." This is a paſſage much frequented by ſhips ſailing from Conſtantinople to Syria and Egypt, and they find here good anchorages.

BOGDANA, a town of European Turkey, in Moldavia, on the borders of Tranſylvania; 60 miles S. of Niemecz.

BOGDEN, Martin, in *Biography*, a favoured pupil of T. Bartholine, and ſtrenuous defender of his fame and opinions, was born at Dreſden, about the year 1630. After viſiting France, England, and other parts of Europe, to improve himſelf in knowledge, he took the degree of doctor in medicine at Baſle in Swiſſerland, in 1652, and at the

end of four or five years, paſſed principally with Bartholine, to whom he was ſtrongly attached, he ſettled at Bern. His works are principally controverſial, defending the priority of the diſcovery of the lymphatics by Bartholine, againſt Rudbeck the Swede, who claimed it; and who, if he did not diſcover them, Haller ſays, has the merit of having more fully and accurately deſcribed them, than Bartholine had done. Bogden, in this conteſt, diſplayed much learning, but equal roughneſs and ill-humour. The titles of his works are; "Rudbekii inſidiæ ſtructæ vaſis lymphaticis Thomæ Bartholini," 4to. and "Apologia pro vaſis lymphaticis Bartholini, adverſus inſidias ſecundo ſtructas ab Olao Rudbek." Haſſniæ, 1654, 12mo. "Simeonis Seth, de alimentorum facultatibus," Gr. and Lat. 8vo. 1658. "Obſervationes Medicæ ad Thomam Bath." The obſervations, 12 in number, are publiſhed in the "Culter Anatomicus," of Lyſer; Copenh. 1665. Haller Bib. Anat. Eloy. Dict. Hiſt.

BOGDIKOTZ, in *Geography*, a town of Ruſſian Siberia, on the Tchulim; 6 miles N.W. of Atchinſk.

BOGDINSKOI, or Bogdom Dabassu, an inexhauſtible ſalt-lake of Siberia, in the ſteppe towards Tzaritzin; the ſalt of which, according to Pallas, is better than that of the Elton.

BOGDO, Great, the higheſt mountain of central Aſia, according to the reports of the Monguls and Tartars, is properly a central ſummit of the Altaian chain of mountains, which gives ſource to the Upper Irtiſh, and ſeems to be delineated in Arrowſmith's map of Aſia at longitude 94°, and latitude 47°. See Altai and Belur.

Bogdo, *Little*, is a mountain of Aſiatic Ruſſia, lying to the north of the Caſpian ſea, near which is a ſalt-lake of the ſame name.

BOGDOMANTIS, in *Ancient Geography*, a country of Aſia Minor. Ptolemy.

BOGDOY, in *Geography*, a name given by the Ruſſians to the Manchews, or Mandſhurs, who inhabit the eaſtern part of Chineſe Tartary, an extenſive and populous diſtrict N.N.E. of China, and who are ſubject to the Chineſe empire. See Mandshurs and Chinese Tartary.

BOGENSEE, a town of Denmark, in the iſland of Funen; 12 miles N.W. of Odenſee.

BOGESUND, a ſmall town of Sweden, in Weſt Gothland, 4 leagues S. of Falkioping.

BOGGILCUND, a diſtrict or circar of Allahabad, in Hindooſtan, ſituate weſt of Benares.

BOGGY Creek, a creek of America, which riſes among the eaſtern branches of Poplar creek, and empties into the Teneſſee, juſt above the Muſcle ſhoals. *Hurricane* creek is a branch of Boggy creek.

BOGHASS, a canal or ſtrait, ſo called in the language of the country, at the mouth of the weſtern or Bolbitic branch of the Nile, now called the branch of Roſetta. This paſſage is not navigable through its whole width; there being only a narrow channel, which, owing to the inſtability of the bottom, and the agitation of the ſea, is continually ſhifting. A pilot or maſter of the Boghaſs is continually employed in ſounding this changeable paſſage, and giving directions to thoſe who navigate it. The increaſing danger of this paſſage led to the operation of cleanſing the canal of Alexandria, and thus to facilitate the communication between Alexandria and the reſt of Egypt. See Bogas.

BOGIA. See Boujeiah.

BOGILLANA. See Baglana.

BOGLIASCO, a town of Italy in the ſtate of Genoa, near the ſea-coaſt; 6 miles E. of Genoa.

BOGLIO, or Beuil, a mountainous territory of Italy, in the principality of Piedmont, and county of Nice, ſeated near the Alps; its chief place has alſo the ſame name. This country was ſurrendered to France in May 1796.

BOGLIPOUR, a town of Hindooſtan, and capital of a province in the country of Bahar, near the Ganges; 35 miles S.E. of Monghir, and 115 N.W. of Moorſhedabad.

BOGLORAY, a town of Poland, in the palatinate of Sandomirz; 24 miles E.S.E. of Sandomirz.

BOGMUTTY, a river of Hindooſtan, which runs into the Ganges near Monghir, in the country of Bahar.

BOGNOR, or Hothampton, (as it is ſometimes called in honour of its founder,) is a pleaſant retired hamlet on the ſouthern coaſt of England, in the county of Suſſex. This place has only riſen into notice within a few years, being, previous to 1790, merely inhabited by a few fiſhermen. About this period ſir Richard Hotham purchaſed ſome ground here, where he built a houſe for himſelf, and had others erected for the accommodation of bathers. His plan of making this a faſhionable bathing place has ſucceeded, but it was not much frequented till after his death, which happened in 1799. Soon after this event, the ground and houſes were ſold in different lots. Some of the purchaſers have built additional dwellings, and Bognor is now become a place of great reſort during the ſummer months. The adjacent villages of Berſted, Felpham, &c. alſo receive a number of ſummer viſitors, who reſort to this coaſt for the purpoſe of its fine beach and mild air. Bognor is 7 miles S. of Chicheſter, and 67 S.W. from London. It has a good hotel, an aſſembly-room, a library, and ſome other eſtabliſhments for the accommodation and amuſement of its viſitors.

BOGODUKHOF, a town and diſtrict of Ruſſia, in the government of Kharkof, ſeated on the Merlo, falling into the Vorſkla; 84 miles N.N.W. of Kharkof.

BOGOE. See Boog.

BOGOGNANO, a town of the iſland of Corſica, 5 leagues N.E. of Ajaccio.

BOGOIAVLENSKIO, a town of Ruſſia, in the government of Ufa; 48 miles S. of Ufa.

Bogoiavlenskoi, a town of Ruſſia, in the government of Archangel, near the coaſt of the White Sea; 72 miles S.W. of Archangel.—Alſo, a town of Ruſſia, in the ſame government, near the river Onega, 100 miles S. of Archangel.—Alſo, a town in the ſame government, on the Pinega; 70 miles E. of Archangel.—Alſo, a town of Ruſſia, in the province of Uſting; 51 miles E.N.E. of Uſting.—Alſo, a town of Siberia, on the Tchulim; 80 miles E.N.E. of Tomſk.

BOGOMILI, or Bogarmitæ, in *Eccleſiaſtical Hiſtory*, a ſect ſprung from the Manichees, or rather from the Maſſalians, towards the cloſe of the eleventh century; whoſe chief, Baſil, was burnt alive by order of the emperor Alexius Comnenus. Being condemned to be burnt, he declared that the fire would not hurt him; upon which the Greeks who carried him to execution, firſt took off his cloak, and flung it into the fire, to try whether it would prove incombuſtible; whilſt it was burning, the poor fanatic cried out, "Do you not ſee that my cloak is untouched, and carried away in the air?" upon which they caſt him alſo into the fire, where he was ſoon conſumed to aſhes. Du-Cange derives the name from two words in the Bulgarian language; *Bog*, *Deus*, and *milvi*, *miſerere*, *have mercy*. The Bogomili denied the Trinity; maintaining that God had a human form; that the world and all animal bodies were created by evil angels; and hence they concluded, that the body was the priſon of the immortal ſpirit, and that it ought to be enervated by faſting, contemplation, and other exerciſes, ſo that the ſoul might be gradually reſtored to its primitive liberty; and that wedlock

was to be avoided; and they alſo maintained that it was the archangel Michael that became incarnate. They rejected the books of Moſes, and only admitted ſeven books of ſcripture; they maintained the Lord's prayer to be the only eucharift; that the baptiſm of the Catholics was only that of St. John, and their's that of Jeſus Chriſt; and that all thoſe of their ſect conceived the Word, or *Logos*, as much as the Virgin, denying the reality of Chriſt's body, which they conſidered only as a phantom. They alſo held, that the body, upon its ſeparation by death, returned to the malignant maſs of matter, without either the proſpect or the poſſibility of a future reſurrection to life and felicity. Moſh. Eccl. Hiſt. vol. iii. p. 110. Jortin's Rom. on Eccl. Hiſt. vol. v. p. 46.

BOGORDSKOI, in *Geography*, a town of Ruſſia, in the government of Archangel; 8 miles S. W. of Mezen.

BOGORODITZK, a town of Ruſſia, in the government of Archangel, on the Dwina; 44 miles S. S. E. of Archangel.

BOGORODSK, a town and diſtrict of Ruſſia, in the government of Moſcow, on the Kliaſma; 28 miles E. of Moſcow.

BOGORODSKOI, a town of Ruſſian Siberia, in the province of Tomſk, ſeated on the Oby. The church belonging to this town is famous for a celebrated picture of the Virgin Mary, called "Oediitria," which is brought every year, on the 21ſt of May, in proceſſion to Tomſk. There are iron works in this place.

BOGOROSTAN, a town and diſtrict of Ruſſia, in the province of Ufa, ſeated on a river falling into the Samara.

BOGOTA, a town and province of New Granada, in Spaniſh South America, ſeated near the river Magdalena. The town is called *Santa Fe de Bagota*, and is the capital of the kingdom of New Granada; it is ſituate on the banks of the ſmall river Pati, which runs into the Magdalena. It was made an archbiſhop's ſee by pope Julius III. in 1554, and an univerſity was erected here in 1610. It has a ſovereign court of judicature, the preſident of which is governor of the whole province or kingdom of New Granada. Near it are ſome gold mines, and the chief modern mines of Peruvian emeralds, juſtly preferred to all others, ſince thoſe of Egypt have been neglected. Among the numerous cataracts of this country Bouguer mentions that of the river Bogota, which paſſes the city of the ſame name about 8 leagues before it joins the Magdalena, ſaid to be a vertical fall of more than 1200 feet. N. lat. 4° 20′. W. long. 73° 40′. When the Spaniards took poſſeſſion of this part of South America, they found in Bogota a nation more conſiderable in number, and more improved in the various arts of life, than any in America, except the Mexicans and Peruvians. The people of Bogota ſubſiſted chiefly by agriculture. The idea of property was introduced among them, and its rights ſecured by laws, handed down by tradition, and obſerved with great care. They lived in large towns; they were decently clothed, and their houſes, compared with thoſe of ſurrounding tribes, might be termed commodious. Government had aſſumed, in this ſtate of civilization, a regular form, and a juriſdiction was eſtabliſhed, which took notice of different crimes, and puniſhed them with rigour. They were acquainted with the diſtinction of ranks, and their chief reigned with abſolute authority. He was attended by various officers and guards, carried with much pomp in a ſort of palanquin, and the road was ſwept before him and ſtrewed with flowers. For the ſupport of this expence taxes were levied on the people, who regarded their prince with veneration, and ſeldom approached him but with an averted countenance. One of the chief cauſes of that obſequious ſpirit, which prevailed among the people of Bogota, was the influence of ſuperſtition. The reſpect they paid to their monarchs was inſpired by religion; and the heir apparent of the kingdom was educated in the innermoſt receſs of their principal temple, under ſuch auſtere diſcipline, and with ſuch peculiar rites, as tended to fill his ſubjects with high ſentiments concerning the ſanctity of his character, and the dignity of his ſtation. This ſuperſtition, which, in the rudeſt period of ſociety, is either altogether unknown, or waſtes its force in childiſh unmeaning practices, had acquired ſuch an aſcendant over thoſe people of America, who had made ſome little progreſs towards refinement, that it became the chief inſtrument of bending their minds to an untimely ſervitude, and ſubjected them, in the beginning of their political career, to a deſpotiſm hardly leſs rigorous than that which awaits nations in the laſt ſtage of their corruption and decline.

The people of Bogota (as well as the tribe of the Natchez) had advanced beyond the other uncultivated nations of America, in their ideas of religion, as well as in their political inſtitutions. The ſun and moon were the chief objects of their veneration. They had temples, altars, prieſts, ſacrifices, and that long train of ceremonies, which ſuperſtition introduces wherever ſhe has fully eſtabliſhed her dominion over the minds of men. But the rites of their worſhip were cruel and bloody; they offered human victims to their deities, and many of their practices reſembled the barbarous inſtitutions of the Mexicans. Robertſon's Hiſt. America, vol. ii.

BOGRA, an uncultivated mountainous tract on the north of the barony of Muſkery, in the county of Cork, and province of Munſter, Ireland. It is upwards of ten miles long, and in ſome parts ſix miles in breadth; and is a common to the adjacent eſtates. In winter it is for the moſt part deep, marſhy, and impaſſable; but in ſummer hard and firm, producing graſs and heath, and is then grazed by vaſt herds of cattle, which are removed to the lower lands when this ſeaſon is over. Large quantities of turf are alſo procured from it. Dr. Smith has applied to it theſe lines of Thomſon:

"The brown burnt earth
Of fruits and flowers, and every verdure ſpoiled,
Barren and bare, a joyleſs dreary waſte
Thin cottaged; and in time of trying need
Abandoned."

Many conſiderable ſtreams flow from this high and wild tract, which diſcharge themſelves into the Lee or Blackwater, as their direction is ſouth and north. Smith's Cork.

BOGRUSH, in *Ornithology*. The *Motacilla Schænobænus*, Linn. and *Red Warbler* of Latham, is deſcribed under this name in the Arctic Zoology.

BOGUE, in *Ichthyology*, the French name of a fiſh of the Sparus genus, *Sparus boops* of Linnæus.

Bogue, Bely, in *Mythology*, the white god to whom the Slavonians paid their adorations. His ſtatue, ſmeared with blood, was covered with flies. His rites conſiſted in diverſions, games, and feaſts. He was a beneficent deity, correſponding to the good principle, the "Oromazes," of the Perſians. The black god, "Toherry Bogue," correſponded on the contrary to the evil principle, the maleficent being Arimanes. He was worſhipped by bloody ſacrifices, and the prayers of his votaries were addreſſed to him in a mournful and plaintive voice.

BOGUSLAW, in *Geography*, a town of Poland, in the palatinate of Kiovia; 32 miles S.E. of Bialacerkiew. N. lat. 49° 36′. E. long. 31° 12′.

BOGUTCHAR, a town and diſtrict of Ruſſia, in the govern-

government of Voronetz, on a rivulet of the ſame name, falling into the Don.

BOGWANGOTD, a town of Hindooſtan, near the Ganges; 11 miles N. of Moorſhedabad.

BOHABOL, in *Ancient Geography*, a town of Aſia in Syria.

BOHADSCHIA, in *Botany*. See PELTARIA.

BOHAIN, in *Geography*, a town of France, in the department of the Aiſne, and chief place of a canton, in the diſtrict of St. Quentin; 10 miles N.N.E. of St. Quentin. The place contains 2152, and the canton 13181 inhabitants. The territory comprehends 172½ kiliometres, and 14 communes.

BOHAR, in *Ichthyology*, a ſpecies of SCIÆNA, deſcribed by Forſkal, as a native of Arabia. The colour is red, lineated, and clouded with white. Forſk. Fn. Arab.

This bears a ſtrong affinity to another fiſh deſcribed by the ſame writer, as an inhabitant of the ſame country, Kaſmira. Gmelin expreſſes a doubt whether it does belong to the SCIÆNA genus. The body is of an oblong form, and covered with ſmooth ſcales. When alive there are two large ſpots on the back, which diſappear after the fiſh is dead. There are two ſhort cirri, or beards before the noſtrils: in the upper jaw two ſubulate teeth, which project beyond the lower, the two middlemoſt of which are placed remote. The lateral line runs nearer to the back. Dorſal and anal fins rounded behind, and the unarmed part of both ſcaled, the ſpines of the latter growing gradually larger: ventral connected by an intermediate membrane. Tail bifid. Gmelin.

BOHAROWCZE, in *Geography*, a town of Poland, in the palatinate of Kaminiec; 60 miles N.W. of Kaminiec.

BOHDANICE, a town of Bohemia, in the circle of Chrudim, which has the privilege of holding fairs.

BOHEA, in *Botany*. See THEA.

BOHEMIA, in *Geography*, called in German *Boierheim*, *Boiheim*, *Boheim*, and corruptly *Boehmen*, that is the habitation of the Boii (ſee BOII); a kingdom of Europe in the Auſtrian dominions; bounded on the north by Miſnia, Luſatia, and Sileſia; on the weſt, by the circle of the Erzgeberg, the Voghtland, the margraviate of Culmbach, and the Upper Palatinate; or, in general, by Franconia; on the ſouth, by Bavaria and Auſtria; and on the eaſt, by Moravia, Sileſia, and the county of Giatz. Bohemia is environed on all ſides with high mountains and large foreſts; towards the ſouth it is ſeparated from Auſtria by a ridge of conſiderable elevation, which paſſes to the north-eaſt of Bavaria; and on the north-weſt, it is parted from Saxony by a chain of metallic mountains, called the Erzgeberg, a word denoting hills that contain mines. On the weſt of the river Eger, near its junction with the Elbe, ſtands the mountainous group of Mileſſou, near which is Donneberg, ſuppoſed to be the higheſt in the province; and on the north-eaſt is the Sudetic chain, which branches from the Carpathian, and divides Bohemia and Moravia from Sileſia and the Pruſſian dominions. This country was formerly remarkable for an extenſive foreſt, a remain of the ancient Hercynia Sylva, which extended from the Rhine to Sarmatia, and from Cologne to Poland. The Gabreta Sylva lay on the ſouth-weſt of the ſame country, where a chain of hills now divides it from Bavaria.

Bohemia, as we have already obſerved, derived its name from the Boii, who under their leader Segoveſus, ſettled in that country about 590 years before the Chriſtian era. The Boii were ſoon after expelled by the Marcomanni; and theſe, being weakened by their wars with the Romans under the conduct of Tiberius, were ſubdued by the Sclavi (ſee SCLAVONIANS), who, like the other Scythians, wandered from place to place with their families and cattle; and, as Strabo informs us, even in the time of Auguſtus Cæſar, lived promiſcuouſly with the Thracians. Afterwards, ſpreading themſelves weſtward, in a few centuries they poſſeſſed Illyricum, Poland, Moravia, and Bohemia. But retaining their ancient manners, they neglected to build cities; and inhabiting the country in detached hordes, they regarded only paſturage and the care of their flocks. The firſt ruler, or chief, mentioned by hiſtorians, was one Czechius, from whom the natives derived the appellation of Czechs, or Zechs, who, quitting Croatia, migrated firſt to Moravia, and from thence to Bohemia, about the middle of the ſixth century, which he found covered with wood, and poſſeſſed rather by herds of wild cattle than by men. Here he ſettled his ſmall colony, and taught the few inhabitants of the country to cultivate the lands, and to ſow corn. After his death, the Bohemians remained for ſeveral years without a ruler or judge; but being now aſſembled in villages, they were anxious to obtain a more ſettled form of government than that which they had found effectual during their paſtoral life. With this view they choſe for their governor a young man whoſe name was Croc, diſtinguiſhed by his prudence, who reſtored peace and order, and maintained the authority of the laws. He was ſucceeded by the youngeſt of his three daughters, Lybuſſa, who was reſpected for her ſkill in the art of divination; and who, about the cloſe of the ſeventh century, married a country labourer of the name of Premiſlaus, who, being called from the plough to the dignity of governor, carried his cloak and ſhoes along with him, as memorials for his poſterity, to prevent their being elated with the proſperity of their condition. This Premiſlaus is ſaid to have founded the city of Prague, to have diſtributed the people into different ranks, and, after quelling ſome temporary inſurrections, to have reigned peaceably till his death. He is ſaid to have been the firſt duke, though others trace the origin of the duchy to an earlier period, and ſay that Czechius was the firſt who bore this title. The government ſeems afterwards to have continued hereditary in his family, though with ſome form of election; and a deſcendant, whoſe name was Borivorius, or Borzivori, embraced Chriſtianity about the cloſe of the ninth century, and, after ſome oppoſition, introduced it into his dominions. On this occaſion ſeveral churches were built, and ſchools erected; but upon the death of his ſon Wratiſlaus I. in the beginning of the tenth century, his wife Drahomira, who aſſumed the government during the minority of her ſons, manifeſted her hatred againſt the Chriſtians, maſſacred about 300 of them in one night, burnt their temples, and ordered them to deliver up their arms. However, upon the acceſſion of her ſon Wenceſlaus II. A. D. 916. the Chriſtian religion was again encouraged; and, in order to prevent diſputes with his brother Boleſlaus, who had been educated under his mother, he ceded to him that part of Bohemia, which lay beyond the Elbe. Wenceſlaus, having obtained a victory in a duel, a challenge to which he accepted for the purpoſe of ſparing the lives of his rebellious ſubjects, was invited by Otho the Great to the diet at Worms, where he offered him the title of king, which Wenceſlaus declined accepting. In the year 932, Wenceſlaus was murdered by his brother Boleſlaus I. ſurnamed the Cruel, who, ſucceeding him, conducted his adminiſtration with great cruelty, perſecuting the Chriſtians, and expelling them the kingdom. His ſon and ſucceſſor Boleſlaus II. ſurnamed the Pious, founded and endowed 20 churches, and obtained leave from pope John IX. to create a biſhop at Prague. His ſubjects formed a conſpiracy againſt him, on account of ſome reforms which he attempted to introduce;

troduce; and encamping on a mountain in the vicinity of Prague, they were expelled thence by the Chriſtians, with the aſſiſtance of the Jews, and obliged to remain in peace. In recompence of this ſervice, the Jews were allowed to build a ſynagogue at Prague. In the eleventh century, Bretiſlaus, the ſon of Udalricus, having obtained the government of Moravia, kept poſſeſſion of it by repulſing the Poles who invaded it; and, ſucceeding to the government of Bohemia, on the death of his father, A. D. 1043, he again defended it againſt Hungarian robbers, by whom it was ravaged, and having concluded a perpetual peace with Caſimir, king of Poland, he died, leaving five ſons, of whom the eldeſt inherited Bohemia: and Moravia was divided among the four youngeſt. Wratiſlaus II. ſucceeded his brother, A. D. 1061; and, in 1086, was honoured with the regal title by the emperor Henry IV. who alſo inveſted him with the domains of Luſatia, Moravia, and Sileſia. This dignity, however, was merely perſonal; and the conſtant title of king only commences with Premiſlaus II. in 1199. He and his immediate ſucceſſors, were ſtyled Ottocari, or Othogari, on account of their attachment to the intereſt of the emperor Otho. Upon the death of Wenceſlaus IV. A. D. 1255, his ſon Premiſlaus Othogar ſucceeded him, and having ſettled his affairs in Bohemia, took poſſeſſion of Auſtria, Stiria, part of Carinthia, and other provinces to the ſouth, and carried his arms into Pruſſia for the defence of the Chriſtians; and having defeated his oppoſers in ſeveral engagements, he prevailed on many of the people to abandon Paganiſm. After his return to Bohemia, in 1271, he is ſaid diſdainfully to have rejected the imperial crown, which was afterwards given to Rodolphus, count of Hapſburg; but Othogar refuſing to do him homage, and to take from him the inveſtiture of his ſtates, alleging that he owed him nothing, and that he had paid him his wages, Rodolph having been great marſhal of his court, was at length obliged to comply, and to deliver five ſtandards to the emperor for the five fiefs which he poſſeſſed. A reconciliation, however, afterwards took place, and Othogar received the inveſtiture of Bohemia and Moravia, on condition of renouncing Auſtria, Carinthia, and Stiria. Wenceſlaus V. ſucceeded his father in 1278, and was elected king of Poland; but refuſed the ſceptre of Hungary, that was offered him in favour of his ſon. In 1310, the ancient lineage failed; and John, the ſon of the emperor Henry VII. of the family of Luxembourg, who had married the youngeſt ſiſter of Wenceſlaus VI., obtained poſſeſſion of the kingdom of Bohemia. John, having reſigned Bohemia to his ſon Charles, and procured for him the imperial dignity, proceeded with him to France, to the aſſiſtance of Philip againſt the Engliſh, and was ſlain in the famous battle of Crecy, in 1346. Charles IV. emperor, having ſucceeded his father, created his brother John marquis of Moravia, erected an univerſity at Prague upon the plan of that at Paris, and engaged pope Clement VI. to erect the ſee of Prague into an archbiſhopric, with this privilege annexed to it, that the archbiſhop ſhould have the honour of crowning the king of Bohemia. He enlarged and beautified his capital, by adding what is called the New City, in which he founded the college of Carlſtein. With the aſſiſtance of ſeveral learned perſons, he reduced the laws of the kingdom to writing, which are ſtill extant, under the name of "Caroline Conſtitutions." He greatly extended the boundaries of his hereditary dominions, and cauſed his ſon Wenceſlaus to be crowned king, in the ſecond year of his age. He alſo prevailed with the electors to chuſe him king of the Romans, in the ſixteenth year of his age; and having commenced the junction of the Moldaw with the Danube, he died before he had executed his deſign; and in 1378, was ſucceeded by his ſon Wenceſlaus VII. In the reign of this prince, who was notoriouſly diſſolute, profligate, and ſavage, and who, by his licentiouſneſs and cruelty, incurred the hatred of his ſubjects, John Huſs and Jerome of Prague introduced the doctrines of the reformation into Bohemia. See Huss, and Jerome. Wenceſlaus died ſuddenly in 1419: and before his brother Sigiſmund, who ſucceeded him as king of Bohemia and emperor of Germany, could come from Hungary to take poſſeſſion of the crown, the Huſſites, under John Ziſca, had acquired great ſtrength, and, upon his approach to the kingdom, they ſent deputies to him, deſiring liberty of conſcience; but, inſtead of granting their requeſt, he only declared, that he intended to govern the kingdom as his father had done. A civil war enſued, in which the troops of Sigiſmund ſuſtained ſeveral defeats; and which, after a continuance of ſixteen years, occaſioned by his breach of faith to Huſs and Jerome, terminated in ſeveral conceſſions, and in his admiſſion into Prague with great ſolemnity and rejoicing. Upon the death of Sigiſmund, in 1438, Albert of Auſtria, who had married his daughter, received the crowns of Bohemia and Hungary. The ſucceſſion was, however, afterwards diſputed and infringed by George Podiebrad, a Huſſite chief; by Uladiſlaus, ſon of Caſimir, king of Poland; and by Matthias, king of Hungary. Uladiſlaus ultimately ſucceeded, being elected, in 1471, by the majority of the ſtates, and ſoon after receiving the inveſtiture from the emperor. Upon the death of Uladiſlaus, in the 45th year of his reign over the Bohemians, and the 23d over the Hungarians, he was ſucceeded by his ſon Lewis in both the kingdoms of Bohemia and Hungary, A. D. 1516; but, in 1526, he engaged the Turks at Mohatz, and being utterly defeated, was drowned in the Danube, in his flight. After the death of Lewis, his dominions fell to Ferdinand, archduke of Auſtria, infant of Spain, and afterwards emperor, who had married Anne, the only daughter of Uladiſlaus: and both the empire, and the kingdom of Bohemia, have ever ſince continued in the houſe of Auſtria. Ferdinand, at a diet of the ſtates held in 1547, declared the kingdom hereditary and abſolute; and when Ferdinand II., in 1620, had routed the army of his rival Frederick at the White Mountain near Prague, Bohemia was reduced fully to the condition of an hereditary kingdom; ſo that from that time the ſtates had no concern with the right of ſucceſſion. The crown, however, is conferred with ſome appearance of election, which right the ſtates of that kingdom pretend to claim; although, by the treaty of Weſtphalia, Bohemia is declared hereditary in the houſe of Auſtria. The king of Bohemia is the firſt ſecular elector, and as ſuch pays homage to the emperor and the empire for his ſtates; and with this exception, he has a right to exerciſe, through all his dominions, the royal authority agreeably to the laws of the kingdom, which prohibit his raiſing contributions or taxes otherwiſe than at the time when the ſtates are aſſembled, the appointment of which is entirely in their own power. He gives his opinion as elector, after the elector of Cologne, and formerly aſſiſted at the aſſembly of the electors only at the election of an emperor, nor did he appear always at the diets of the empire. He is arch-butler, or arch-cup-bearer, of the holy Roman empire; and on this office his right to chuſe a king of the Romans is ſaid to depend. It has been alleged, that Bohemia has been of old time a genuine ſtate of the German empire, without contributing to its taxes, which was a privilege conferred upon it by Frederick II. in 1212, who at the ſame time exempted it from the juriſdiction of the ſupreme judicatory of the empire. In 1708, it was acknowledged by the three colleges of the empire, at an act of the diet called "the admiſſion," that the king and elector of Bohemia has an undoubted right of ſeat and voice in all its aſſemblies; in conſequence of which the emperor promiſed,

mised, that on account of his hereditary kingdom of Bohemia, and of the countries belonging to it, he will pay an electoral proportion of all taxes and imposts of the empire and circle, and also 300 florins yearly to the chamber-judicatory; the collective body of the empire engaging at the same time to take the kingdom of Bohemia, and the countries united with it, under its protection and defence.

Bohemia, ever since the time of Charles IV., has deen divided into twelve circles, besides Prague, which is considered as a distinct territory. These are Kaurzimer (comprehending Great Prague), Pilsner, Leutmeritzer, Konigingratzer, Rakowitzer (including Beraun), Chrudimer, Prachiner, Slaner (comprehending Little Prague), Bunzlauer, Saatzer, Czaslauer, and Bechiner. Each circle has two head-men, or captains, appointed annually, for the administration of the government, one from the state of lords, and the other from that of knights. The duchy of Silesia, the marquisate of Moravia, and that of Lusatia, formerly held of this crown, but at present only Moravia, which is incorporated with the kingdom of Bohemia, and is in possession of the house of Austria. In 1742, the county of Glatz was ceded to the king of Prussia, and by him added to Silesia. The government of Bohemia is managed by six different courts; *viz.* the council of the regency, or great royal council, in which presides the great judge or burgrave of Bohemia, who has under him 18 lieutenants of the king's and other assessors; the council, or superior chamber of justice, at which the great master of the kingdom is president; the chamber of fiefs; the new tribunal, to judge the appeals of the German vassals, with its president, vice-president and assessors; the royal chamber of finances, with a president, and vice-president; and the chancery, which always follows the court. The states, consisting of the clergy, nobility, and gentry, and representatives of the towns, meet at Prague, where a commissioner from the sovereign points out the necessity of granting such supplies as the court demands, which, however exorbitant, are granted without hesitation or examination, though not sometimes without subsequent complaint. The clergy are composed of the archbishop of Prague, several bishops, provosts, and abbots, besides the inferior clergy. The nobility consist of princes, counts, barons, and knights; the others are burghers, husbandmen, and peasants.

The established religion of Bohemia is popery; but there are many protestants among the inhabitants, who are now tolerated by the wise regulations of Joseph II. in the free exercise of their religion. The Jews at Prague are indulged also with a toleration. The archbishop of this city is born legate of the holy apostolic see of Rome, and crowns the king of Bohemia; he is also a prince of the holy Roman empire, primate of the kingdom, and perpetual chancellor of the university of Prague. His suffragans are the bishops of Leutmeritz and Konigingratz. The government of the church and clergy is vested in the archiepiscopal consistory, from which an appeal lies to the king or the pope.

The extent of Bohemia, and also its population, have been variously estimated. Its length is about 162 miles, and its breadth 142. Some centuries ago, the inhabitants were estimated at three millions; but in later times they have been very much diminished. It is said, that in the year 1622, and the three or four following years, no fewer than 30,000 families, and many other individuals quitted the country, among whom were many of the nobility, on account of the intestine religious wars, and the succeeding irruptions of the Swedes. In M. Hoeck's "Statistical View of the States of Germany, &c." 1801, the kingdom of Bohemia is stated to contain 962½ square miles, 250 cities, 308 market towns, 11,455 villages, 430,000 houses, 1,340,510 men, 1,466,433 women, and the total of the population 2,806,943. The number of Lutherans has been estimated at 9050, of the reformed at 25,110, and of Jews at 36,000. Some writers have stated the number of Protestants at 36,000, and that of the Jews at 40,000, of whom 8000 are settled at Prague. In their dispositions, habits, and manners, the Bohemians resemble the Germans; being indeed a mixture of Sclavonians and Germans, the former of whom live in villages and are slaves. They have no middle rank of people; for every lord is a petty sovereign, and every tenant a slave. The Bohemian peasants, on the imperial demesnes, have been lately relieved from the state of villainage, in which they had been so long and so unjusty retained; and it is hoped, that the example of the emperor will be followed by that of the Bohemian nobility in general, so that their vassals may recover those rights of which they have been long deprived. The natives of this country are singularly robust and strong-built, handsome, except that their heads are somewhat too large, and active, shrewd, courageous, and sincere. The gentry are ingenuous, brave, and more inclined to arms than arts. Learning in Bohemia is in a low state: though the kingdom possesses one university, 12 gymnasia, 2,219 German schools, 200 schools of industry, and 33 ladies' schools.

The Bohemian language is a dialect of the Sclavonic, but somewhat harsher than that of their neighbours, who speak the same language, and who change the consonants, and particularly the *l*, more into vowels. The Bohemians formerly used the same letters with the Russians; but in the time of Boleslaus the Pious, the Latin was introduced among them. Upon the first introduction of Christianity in this reign, the religious service was performed in the Latin tongue, a language unknown to the people; but in consequence of the representation of Methodius to pope Nicholas the Great, he allowed the prayers to be rehearsed in the vulgar tongue. But some years after, when a bishop was sent into Bohemia, the Latin tongue was again ordered to be introduced in all their churches. Persons of a superior class, from their intercourse with the court of Vienna, speak high Dutch or German, with which the language of the common people is also intermixed.

Bohemia is, upon the whole, one of the highest countries in Europe, and forms a large extended plain, surrounded, as we have observed, by high hills covered with wood. The vale in the middle, which is watered by the Elbe, the Moldaw, and the Egra, is protected from the wind, and it has neither lakes nor morasses which taint the air, which is dry and clear, with unwholesome vapours. The climate is therefore salubrious, and not liable to those sudden changes, which are so fatal to health in other places. The heat of summer, and the cold of winter are alike moderate. The soil is in general rich, though in some places it is sandy. It is fertile in corn, wine, fruits, pasture, saffron, ginger, hops, wool, flax, and timber. The Bohemian hops, which are much valued, are carried as far as the Rhine in great quantities. Bohemia produces a strong large breed of horses, many of which are purchased for the use of the French cavalry. Its mountains are the richest in Europe, in gold, silver, precious stones, copper, quicksilver, iron, lead, tin, sulphur, and saltpetre. The Bohemian tin is reckoned the best of any except the English. All kinds of marble are also found in this country, together with pit-coal, alum, muscovy-glass, excellent mineral waters, and hot baths. It also furnishes numerous herds of cattle, and abundance of game and wild fowl, and also bears, lynxes, wolves, foxes, badgers, martens, beavers, and otters. Its rivers and ponds afford a plentiful supply of fish, and such as are of the best quality and flavour.

According to the ſtatement of M. Hoeck (ubi ſupra,) Bohemia had, in 1787,

	Acres.	Sq. Toiſes.
1. Of ploughed land,	3,609,360	776
2. Ponds,	69,115	1373
3. Fields,	220,136	1393
4. Meadows,	798,393	1066
5. Gardens,	85,712	722
6. Marſhy ground,	65,515	970
7. Paſtures and heaths,	613,131	1209
8. Vineyards,	4,482	672
9. Woods,	2,319,811	557
Total	7,785,655	8738

The territorial produce of grain, forage, vines, woods, and rivers, amounted, in 1789, to 30 057,939 florins. Of cattle there were, in 1771, 9789 oxen, 2338 bulls, 9688 cows, 2723 calves, 8452 ſheep, 16,738 hogs, 564 he-goats, 2758 ſhe-goats, and 533 aſſes. The produce of grain amounted to two millions of minots (a minot being equal to three buſhels) of wheat, ten millions of minots of grain, four millions of minots of barley, and eight millions of minots of oats. In the liſt of natural productions are alſo to be reckoned fruit-trees, hops, principally in the circle of Saaz, flax, tobacco, ſaffron, poultry, bees (of which, in 1791, there were 20,257 hives), tin (chiefly at Schlackenwalde, and there are ten mines of tin in the circle of Saaz, and two in that of Leutmeritz), cobalt, 10,000 quintals in the circle of Saaz, ſilver, alum, at Commothau, in 1788, 1,539 quintals. This author alſo ſtates, that Bohemia had, in 1782, 95 manufactures, which employed 139,613 workmen. Theſe manufactures are of linen, wool, cotton, ſilk, paper, glaſs, leather, &c. amounting in the whole to 35,645,447 florins, of which ſtrangers take to the value of 11,840,737 florins. The articles of export, according to his enumeration, are alum, Epſom-ſalt, butter and greaſe, fiſh, flax, poultry, grain, mineral waters, hare-ſkins, wood, hops, cobalt, hides and ſkins, fruit, horſes, pork, brimſtone, vitriol, game, flax, tin, dimity, articles in iron, articles in glaſs, garnets, hats, linens, braſs, paper, pot-aſh, aqua fortis, lace, cloth, and thread. The articles of import are cotton, lead, white lead, books, iron, and iron articles, colours, flax, jewellery, ſpicery, horned cattle from Hungary, coffee, cotton, ſtuffs, galls, merchandiſe of Lyons, liqueurs, ſilks, Hungarian cattle to the value of 800,000 florins, and wine to the value of 500,000 florins. The balance of trade is ſaid to be in favour of the country. M. Hoeck alſo informs us, that the revenues of the ſtate are fifteen or ſixteen millions; but that the expences are ſo high, that out of this ſum the ſurplus amounts only to 636,000 florins; that the contribution in 1789 was 3,646,017 florins, and the tax on the Jews 216,006 florins; and that the annual revenue from the domains of the crown was, during the life of Maria Thereſa, 332,720 florins; theſe domains are now eſtimated at 177,774 acres. The number of ſoldiers to be furniſhed by Bohemia, in time of peace, is 54,964; and, in time of war, 76,896. The capital city of Bohemia is Prague; which ſee.

Bohemia, a broad navigable river of North America, 10 miles long, which runs W.N.W. into Elk river, in Maryland, 11 miles below Elkton.

BOHEMIAN, or Moravian, Brethren, in *Eccleſiaſtical Hiſtory*, is an appellation anciently given to the Proteſtants in Bohemia. By their adverſaries they were called *Picards*, i. e. *Beghards*. They were deſcended from the better ſort of Huſſites, and were diſtinguiſhed by ſeveral religious inſtitutions of a ſingular nature, and well adapted to guard the community againſt the reigning vices and corruptions of the times; and as ſoon as they heard of Luther's deſign of reforming the church, they ſent deputies, in the year 1522, to recommend themſelves to his friendſhip and good offices. In ſucceeding times, they continued to manifeſt the ſame zealous attachment to the Lutheran churches in Saxony, and alſo to thoſe that were founded in other countries. Upon this their religious principles were examined, and nothing was found, either by Luther or his diſciples, in their doctrine or diſcipline, that was liable to cenſure. Their confeſſion of faith, though not altogether approved by this reformer, was regarded as an object of toleration and indulgence. Nevertheleſs, the death of Luther, and the expulſion of theſe brethren from their country, in 1547, changed their religious connections; and many of them, more eſpecially of thoſe who retired into Poland, embraced the religious ſentiments and diſcipline of the reformed. Their attachment to the Lutherans ſeemed, however, to be revived by the convention of Sendomir in 1570; but as the articles of union, that were drawn up in that aſſembly, ſoon loſt their authority, the Bohemians by degrees entered univerſally into the communion of the Swiſs church. This union was at firſt formed on the expreſs condition, that the two churches ſhould continue to be governed by their reſpective laws and inſtitutions, and ſhould have ſeparate places of public worſhip; but, in the following century, all remains of diſſenſion were removed in the ſynods held at Aſtrog, in 1620 and 1627, and the two congregations were formed into one, under the title of "The Church of the United Brethren." In this coalition the reconciled parties ſhewed to each other reciprocal marks of toleration and indulgence: for the external form of the church was modelled after the diſcipline of the Bohemian Brethren, and the articles of faith were taken from the creed of the Calviniſts. See Unitas *Fratrum*.

Laſitius has a treatiſe De Geſtis Fratrum Bohemicorum. Camerarius has alſo given the hiſtory of the Bohemian brethren, from whom eccleſiaſtical hiſtorians have derived a large train of ſects, as the Huſſites, Adamites, Taborites, Calixtins, &c. which ſee reſpectively.

Bohemian *chatterer*, in *Ornithology*, a bird of the *Paſſerine* order, common in many parts of Europe, in Northern Aſia, and America. It ſometimes viſits the ſouthern parts of Britain in the winter. The common Engliſh name of Bohemian chatterer was impoſed upon this bird by old writers, under the idea that it was peculiar to Bohemia. Later authors call it the *Waxen chatterer*, from the horny appendages at the extremity of the ſecondary quill-feathers, which are of a ſcarlet colour, and in appearance bear ſome reſemblance to ſealing-wax. This is called *Ampelis garrulus* by Linnæus. Donov. Brit. Birds, &c.

BOHEMICUS, the name of a ſpecies of Falcon that inhabits the mountains of Bohemia. The legs of this kind are yellowiſh; body above cinereous, beneath hoary white; five exterior quill-feathers black on the outſide; orbits of the eyes white. Gmel. *Falco Bohemicus*. *Macuſe habicht, miſſylauce*, Mayer.

This bird is ſcarcely a foot in length; bill near the angles of the mouth yellowiſh; irides yellow; tail acute and long; legs thickiſh, and feathered below the knees; claws black and roundiſh. Feeds on mice.

BOHIO, in *Geography*, a river of Chili in South America.

BOHKAT, in *Ichthyology*, is the Arabic name of a ſort of Ray that inhabits the Red ſea, and is deſcribed by Forſkal under the appellation of *Raja djiddenſis*.

BOHME, in *Geography*, a river of Germany, which runs into

into the Aller, 4 miles S.E. of Bethem, in the principality of Luneburg-zell.

BOHMISCHKRUTT, a town of Germany in the archduchy of Auſtria, 5 miles S.S.W. of Feldſburg.

BOHN, John, in *Biography*, was born at Leipſic the 20th of July 1640, where he received the rudiments of his education. At a proper age his father ſent him to Jena, to be initiated into the ſtudy of medicine. In 1659, he returned to Leipſic, continuing his ſtudies there, until 1663, when deſirous of participating in the knowledge of the improvements making in his profeſſion, in different parts of Europe, he went to Copenhagen, Holland, England, France, and Switzerland, every where attending the lectures of the moſt celebrated maſters, but particularly attaching himſelf to Malpighi. Returning, at the end of two years, to Leipſic, he took his degree of doctor in medicine, and was in ſucceſſion advanced to the rank of profeſſor in anatomy, and in therapeutics. In 1691 he was appointed public phyſician to the city of Leipſic; and, in 1700, dean of the faculty of medicine, which offices he continued to hold with credit to the time of his death, in 1718.

Beſides numerous diſſertations on the different branches of medicine which had great merit, he publiſhed, in 1668, "Exercitationes phyſiologicæ xxvi.," 4to. This work was afterwards conſiderably enlarged, and republiſhed in 1680, under the title of "Circulus anatomico-phyſiologicus, ſive œconomia corporis animalis," 4to. In this he examines, with accuracy and judgment, the different hypotheſes then prevailing in medicine. He here firſt ſhewed the difference between the cyſtic and the hepatic bile. Finding the liquor amnii coagulable, he ſuppoſed it contributed to the nouriſhment of the fœtus; which, however, later experience contradicts; as fœtuſes born without heads, or where the paſſage through the œſophagus into the ſtomach has been cloſed, are found to attain, in utero, equal bulk and firmneſs, as thoſe that are perfect. He ſuppoſed the heart to be excited to contraction by the ſtimulus of the blood; and ſhews the oſſa pubis are not ſeparated in parturition, to allow a free paſſage to the fœtus; which was in his time the prevailing doctrine. In his "De variolis, hactenus in patria graſſatis," publiſhed in 1679, he adviſes giving purgatives with calomel, on the firſt attack of the complaint, with the view of rendering the diſeaſe more mild; a practice of which later experience has proved the utility. In his "De Renunciatione vulnerum," 1689, 4to. Amſterdam, he ſhews what wounds are neceſſarily fatal. His treatiſe "De Officio medici duplici, clinico, et forenſi," 4to. 1704, gives rules for the conduct of phyſicians, in attending their patients, and in giving evidence before a court of judicature. This is a work of great merit, and has ſearcely been exceeded by any later production on the ſubject. Theſe have all been frequently reprinted. Haller. Bib. Med. Eloy. Blumenbach.

BOHOL, in *Geography*, one of the Philippine iſlands between Manila and Mindanao, about 16 leagues long from north to ſouth, and 8 or 10 broad. The ſouth coaſt towards Mindanao is the moſt populous; that is, from Lobag, the metropolis, to the little iſland or peninſula of Pangloo. The ſoil does not produce rice, but is ſaid to be rich in gold mines, and to yield, in great abundance, cocoas, batatas, and ſeveral ſorts of roots which ſerve inſtead of rice. In the mountains there are multitudes of cattle and fiſh in the ſea, which the natives exchange with thoſe of the neighbouring iſlands for cotton. N. lat. 10°. E. long. 122° 5′.

BOHONIZ, a town of Bohemia, in the circle of Bechin, 2 miles S.S.W. of Teia.

BOHRAN, a town of Sileſia, in the principality of Breſlaw, 16 miles ſouth of Breſlaw.

BOHRLITZ, a town of Moravia, in the circle of Brunn, 9 miles W.N.W. of Auſpitz.

BOHUS, or Bahus, a fortified iſland of Sweden, in Gothland, encircled by two branches of the Gotha, about 9 miles north of Gotheborg. The fort ſtands on a rocky eminence, and was formerly celebrated in the hiſtory of Norway, as a place of conſiderable ſtrength, and forming the frontier fortreſs during the conſtant wars between the Danes and Swedes. It was erected in 1309 by Hacquin IV. king of Norway, and, before the invention of gun-powder, it was a wooden fortreſs; but in 1448 was built with ſtone by Chriſtian I. The ſituation is ſtrong, and it is garriſoned by 100 men. The ſummit affords a pleaſing view of the Gotha, winding at the feet of barren rocks. Bohus gives name to a juriſdiction of which it is the capital. It formerly belonged to Denmark, but by the treaty of Roſchild, in 1658, it was ceded to Sweden.

BOHUSLAW, a town of Poland, in the palatinate of Kiov, near the river Ros. N. lat. 49° 37′. E. long. 31° 11′.

BOJA, in *Antiquity*, a collar or chain faſtened about the necks of criminals, to prevent their eſcape.

The word is alſo written *boga*, *bodia*, and *baga*.

BOIA, in *Ancient Geography*, an iſland in the Ægean ſea. Anton. Itin.

BOJADOR, Cape, or Bajadore (which ſee), in *Geography*, lies on the weſtern coaſt of North Africa, placed in the Tables of the Commiſſioners of Longitude, in N. lat. 26° 12′ 30″, W. long. 14° 27′. and, in Rennell's map, in N. lat. 26° 20′, W. long. 14° 17′.—W. long. 14° 49′, by M. Fleurieu, and 14° 28′ Conn.-de-Temps. This cape was doubled by Gilianez and the Portugueſe navigators, under the direction of prince Henry, and emboldened by their voyages to Madeira, which required their quitting the coaſt and venturing into the open ſea, in the year 1433. For 20 years before this time, this cape had been the boundary of their navigation, and it had been deemed impaſſable. But this ſucceſsful voyage, placed by the ignorance of the age on a level with the moſt famous exploits recorded in hiſtory, opened a new ſphere to navigation, as it diſcovered the vaſt continent of Africa, ſtill waſhed by the Atlantic ocean, and ſtretching towards the ſouth. Of ſuch conſequence was the doubling of this cape, that the Portugueſe ſoon after advanced within the tropics, and in the ſpace of a few years diſcovered the river Senegal, and the whole coaſt extending from cape Blanco to cape de Verd.

BOIANO, a town of Naples, in the county of Moliſe, the ſee of a biſhop, ſuffragan of Benevento, who reſides at Campo-Baſſo; 9 miles ſouth of Moliſe. See Bovianum.

BOIARDO, Matteo-Maria, in *Biography*, count of Scandiano, a perſon eminent for literature, was born at Fratta near Ferrara, about the year 1430, and educated at the univerſity of that city, where he principally reſided. Being highly eſteemed by the dukes Borſo and Hercules I., he was appointed by the latter governor of Reggio in the Modeneſe, where he died in 1494. He was well acquainted with the Greek and Latin languages; and tranſlated into Italian, from the former, the hiſtory of Herodotus, and from the latter, the golden age of Apuleius, and the chronicle of Ricobaldo. His eclogues in Latin verſe are reckoned among the moſt elegant productions of that age. He alſo wrote in Italian verſe a comedy, entitled "Timon," taken from a dialogue in Lucian, and other pieces. But his greateſt fame was derived from his "Orlando Inammorato," which combines with the ancient epic the extravagance of modern romance. His ſtyle was rude, and his verſification ſtiff and harſh; but the fervour of his fancy and the livelineſs of his imagery rendered this work, which he left unfiniſhed, captivating and popular. It was continued by Niccolo Agoſtino,

and

and recompoſed and poliſhed, about half a century afterwards, by Lud. Domenico and Fr. Berni. The work of the latter is ſo well executed, that it has almoſt ſuperſeded the original. The beſt edition of Boiardo's own performance is that of Venice in 1544. This work ſerved as the model and groundwork of Arioſto's "Orlando Furioſo;" which is properly a continuation of it with new adventures. Boiardo's ſonnets bear the character of a much purer ſtyle than his Orlando. Moreri.

BOIARKI, in *Geography*, a town of Poland, in the palatinate of Kiov, 38 miles S.S.E. of Bialacerkiew.

BOICININGA, or, more properly, Boiciningua, in *Zoology*, the Braſilian name of the moſt common kind of rattle-ſnake that is found in South America:—*Crotale boiguira* of Boſc.

BOICUAIBA, a kind of Peruvian ſerpent, ſuppoſed to belong to the *Boa* genus. It is deſcribed as being twenty feet long, black on the anterior part, the reſt yellow.

BOIGA, the name of an American ſnake, called by Linnæus *Coluber abaetulla*.

BOIGUACU, the name of a ſort of ſerpent, called alſo *iiboia*, and by the Portugueſe *Cobra de veado*. The relations of thoſe writers who ſpeak of this extraordinary creature partake rather of the marvellous, inſomuch that we cannot but entertain conſiderable doubt as to the identity of the ſpecies; that it is of the boa tribe there can be no diſpute. Perhaps it is no other than the *ibiboboca* and *boiguacu* of Seba, which Dr. Shaw deſcribes under the name of *Boa regia*; a ſpecies ſomewhat allied to conſtrictor, and of which the hiſtory has probably been confounded with that of the latter kind. The boiguacu is repreſented as the largeſt of all the ſerpent tribe, in which it agrees with conſtrictor. It grows, we are told, to the length of four and twenty feet, and more. The middle of the body very thick, but becoming ſmaller at the head and tail. Down the middle of the back runs a chain of black ſpots, a hand's breadth diſtant from one another, each having a ſpot of white in its middle; and below theſe are two other rows of ſmaller black ſpots, towards the belly. Each jaw is ſaid to be furniſhed with two rows of ſharp teeth, white as pearl. The head very broad, with two protuberances over the eyes, and, in ſome of this ſpecies, two claws, like thoſe of birds, behind the anus, towards the tail. The laſt particular of which muſt evidently be an abſurd miſtake, ariſing from the inattention of the deſcriber.

We are further told, that the boiguacu is a terrible creature, one that preys upon the larger animals, and will ſeize upon a man. That it either lies in ambuſh in the thickets, or on the branches of large trees, from which it throws itſelf upon its prey. It has no venom in its bite; and its fleſh is eaten and eſteemed a delicacy. This ſort is common in the Brazils. The ſize to which it attains ſometimes is aſtoniſhing. Borritus preſerved the ſkin of one (ſuppoſed to be the ſame) which had been killed by himſelf, that was twelve yards long; and he relates, that there was a ſerpent of this kind deſtroyed in Java, that meaſured thirteen yards and a half in length, and had, when killed, a boar in its belly. And de Laet relates, that in Rio de la Plata there are ſome of this kind of ſerpents ſo large, that they will ſwallow a whole ſtag, the horns not excepted. This is probably exaggerated. It is affirmed of the boa conſtrictor, by others, that when the enormous creature has gorged an animal of this kind, the horns remain ſticking out of the mouth of the ſerpent, till the digeſtion of the fleſh takes place, and the horns drop off. The boiguacu is eaten by the natives of Brazil.

BOII, in *Ancient Geography*, a people, who, according to Cæſar (lib. vi. c. 24.), were a Gauliſh nation, but from Gaul paſſed into Germany, and, ſettling in the preſent Bohemia, continued there till they were expelled by the Marcomanni. Strabo calls them at different times Celtes and Gauls; and M. Pelloutier is of opinion that they were a tribe of the Celtæ, who inhabited Thrace and Illyria. Some of theſe, he ſays, occupied the Hernician foreſt on the other ſide of the Danube, and migrated into Bohemia; others were mixed among the inhabitants of Thrace; and others remained in Illyria, between the Danube and the Drave. Of theſe Boii there were, therefore, ſeveral diſtinct tribes. After Bellovesus had made an irruption into Italy through the country of the Taurini, the Boii and Lingones entered it by the Pennine Alps. Theſe Boii occupied the more ſouthern part of Gallia Ciſpadana, or Ciſalpine Gaul, and were ſeparated from Etruria by the Apennines, and from the Senones by the Rubico. Their principal city was Bononia. In the year of Rome 395, they advanced in Italy as far as the plain of Prænelte, and were defeated there by the dictator C. Sulpicius. Purſued by the Romans, they retired over the Danube, and inhabited the confines of Pannonia and Illyria, along with the Tauriſci and Scordiſci. In this country they contended with Boerebiſtas, king of the Getæ, and were deſtroyed by his troops. Their country afterwards remained deſert and uncultivated, and was called the "deſert of the Boii." The Romans in proceſs of time built here the towns of Scarabantia and Sabaria. Cæſar is ſuppoſed to have referred to theſe Boii, when he ſays, that the Boii who had remained on the other ſide of the Rhine, and who had deſcended from Noricia, where they laid ſiege to the town of Noreia, were ſummoned by the Helvetii to unite with them in an irruption into Gaul. Another body of the Boii having entered into Germany, ſettled on the north of the Danube, in an extenſive country, almoſt wholly ſurrounded by mountains, and having on the weſtern part the Hercynian mountains. This country was afterwards occupied by the Marcomanni, and is now called Bohemia. Theſe Boii were blended by degrees with other nations; but retaining ſome kind of importance, they preſerved an imperfect trace of their name in that of Boioarii, whence proceeded Bavaria. The Boii, who joined the Helvetii on their attack of the Gauls, were overpowered by Cæſar; but after their defeat, the Ædui prevailed with Cæſar to allow them a ſettlement, on account of their diſtinguiſhed valour, in a ſmall diſtrict of their territory. It is ſaid that he built for them a ſmall town called "Gergovica," of which no trace now remains. M. d'Anville places theſe Boii in a kind of peninſula, formed by the rivers Liger and Elaver, before their re-union. Another body of the Boii, denominated by Auſonius "Picci," occupied the weſtern part of Gaul, comprehended in Novem-Populana, ſouth-weſt of the Bituriges Viviſci, upon the ſea-coaſt.

BOIL, or Furuncle, in *Surgery*, is a painful, circumſcribed, and inflammatory tumour, ſeldom larger than a pigeon's egg, generally of a conical figure, ſeated in the ſubcutaneous adipoſe membrane, and proceeding from an internal cauſe. Its apex or central point is but ſlightly raiſed above the ſkin, and commonly tends to ſuppuration. No part of the ſurface of the body is exempt from the attacks of this diſorder, but thoſe parts are more liable to boils which abound with cellular ſubſtance. The purulent fluid they contain is uſually incloſed in one or more cyſts or ſacculi, and is very ſlow in coming to a ſtate of full maturation; ſo that it is requiſite to aid the formation of matter, by warm ſtimulating applications, and at the ſame time to ſupport the conſtitution by ſtrengthening remedies, nutritious diet, and ſalubrious air.

Several boils will often appear at the ſame time, and after they have healed, new ones may ariſe; in which caſe, we may ſuſpect the patient to be of an ill habit of body, and to re-

quire particular medical attention. But it is a very bad practice, though by no means uncommon, to adminiſter frequent purges in ſuch caſes, which tend ſtill more to diminiſh the tone of the patient, already too much exhauſted. The ſtate of the ſyſtem muſt be remedied by ſuch means as are indicated by the peculiar circumſtances of the patient; for no general plan can be preſcribed, which is proper in all caſes.

Before a conſiderable boil appears, the patient ſometimes feels himſelf indiſpoſed, rather feveriſh, and is troubled with a number of ſlight complaints, which all diſappear as ſoon as the tumour is formed; ſo that in this caſe it ſeems to have ſome ſimilarity with a critical metaſtaſis. Otherwiſe, boils, on account of the ſenſe of tenſion and pain which they occaſion, are more troubleſome than dangerous.

The beſt common method of treating theſe tumours locally, is to bring them as ſoon as poſſible to ſuppuration, as this ſeems to be their natural tendency; and as the attempt to diſcuſs them generally ſucceeds either very imperfectly or not at all, ſome few caſes excepted. For diſcuſſing them are recommended the external applications of ſpirit of vitriol mixed with honey, ſtrong wine-vinegar, camphorated oil, &c. In moſt caſes, however, it is neceſſary that we ſhould immediately endeavour to promote ſuppuration, which may be done by means of ſimple emollients; ſuch as bread and milk poultices, linſeed cataplaſms, or a mixture of oatmeal and honey. If the pain be extremely great, we may add a ſmall quantity of the extract of hemlock or poppies, and give a grain or two of opium internally. When the inflammation is moderate, but the hardneſs conſiderable, ſtimulant and calefacient remedies, ſuch as roaſted onions, white-lily roots, gum ammoniac, &c. muſt be combined with the emollients. Mr. Fielitz affirms that no remedy brings boils ſo eaſily and quickly to ſuppuration, as the leaves of the *ricinus communis* boiled in milk, and applied in the form of a poultice.

When the tumour does not burſt ſpontaneouſly, which it generally does at its point, it is to be opened with a lancet. Beſides the general rules, according to which ſuch an abſceſs muſt be treated, it is neceſſary alſo that the core or membranous part of the boil ſhould be extracted in due time, and that all the remaining hardneſs about the circumference of the ſore ſhould be diſcuſſed. For as long as this core remains in the cavity, the ſore will not heal perfectly, neither can it be brought to heal unleſs the hardneſs be diſcuſſed, but either an ulcer or a fiſtula is produced, or the ſore ſkins over, whilſt an induration ſtill remains behind, which gives riſe, according to the part in which it is ſituated, to various troubleſome ſymptoms, and after ſome time becomes again inflamed, nor does it diſappear entirely till it is diſcuſſed by a complete ſuppuration.

We may indeed attempt to diſcuſs ſuch indurations by means of the uſual deobſtruents, ſuch as the external applications of mercury, hemlock, ſoap, belladonna, &c. but they will generally fail of their effect, and we ſhall be obliged to wait till a new inflammation is produced. It is therefore beſt to ſupport and promote the ſuppuration from the very commencement, and not to ſuffer the abſceſs to heal up till all remains of induration have diſappeared; and when the ſuppuration does not proceed with ſufficient vigour, it ought to be promoted by means of warm turpentine, and digeſtive ointment. If this do not produce the requiſite effect, it ſhould be mixed with red precipitate; and to the indurated parts we ought to apply externally hot fomentations, with other emollient and ſtimulant remedies, according to the general rules laid down under the article Abscess.

Boils, *gum*. See Gum.

BOILEAU, Nicholas, named *Deſpreaux*, in *Biography*, an eminent ſatirical poet and critic, was born either at Paris, or at Crone near that city, in 1636. Boileau himſelf, after having been truly ennobled by his writings, had the ſilly vanity to pique himſelf on the high antiquity of his lineage. He pretended that John Boileau, the anceſtor of his family, was ennobled in 1371 by Charles V. king of France: and he boaſted, in conſequence of a ſuit inſtituted againſt his family, and occaſioned by a ſevere ſcrutiny into the validity of titles aſſumed by the nobleſſe of the kingdom, under a commiſſion of inquiry eſtabliſhed by Lewis XIV. in 1695, that he had gained his cauſe with flying colours, and that he had a patent in his poſſeſſion which allowed him a nobility of 400 years' antiquity. It is ſaid, however, that the ſentence paſſed in favour of Boileau's nobility was the reſult of his reputation as a poet, honoured with the protection of the king; that the titles produced had been fabricated: and that a writ had been found among the papers of the poet for 20 louis d'ors, paid by him for his ſhare in the titles which had been forged by an obſcure perſon of the name of Haudiquer. However this be, his own writings were unqueſtionably his beſt "lettres de nobleſſe." As a younger brother, he was harſhly treated in his youth, more eſpecially becauſe his father regarded him as a heavy and ſtupid lad, deſtitute of that vivacity of temper and underſtanding for which his elder brothers were diſtinguiſhed. We are informed alſo, that he underwent an operation for the ſtone at eight years of age. Theſe circumſtances probably induced him to declare, that if he could be reſtored to infancy, on the hard conditions he had experienced, he would not have accepted the grant; and hence he always diſputed the common opinion that infancy is the happieſt period of our lives. Deſpreaux, indeed, ſeems not to have thought the other parts of his life more happy than his infancy; to him all appeared equally miſerable; youth tormented with paſſions, maturity with cares, and old age with infirmities; and he ſeemed to have adopted in ſome meaſure that philoſopher's opinion, who, when he was aſked "what was the happieſt period of a man's life?" anſwered, "that which is paſt." "It would be difficult," ſays Deſpreaux, "to determine this queſtion; we are ſure, however, that it is hardly ever the preſent time." Boileau was intended by his father for the profeſſion of an advocate; but his taſte for polite literature, to the culture and gratification of which he devoted his leiſure hours, diſqualified him for this mode of life; and his repugnance to it was ſtrongly indicated by his dropping aſleep, while his brother-in-law, M. Dongois, a clerk of parliament was reading an arret, which he had taken great pains to compoſe. Upon this, he was ſent home to his father as an invincible dunce, who would be nothing elſe but a ſimpleton during his life. Relieved from the embarraſſment of purſuing a profeſſion which he deteſted, his attention was next directed to ſcholaſtic divinity, from which he was equally averſe. When his father found, that his views reſpecting him were altogether fruſtrated, he allowed him to indulge his own inclination, and to devote himſelf wholly to literature. At the age of thirty years, Boileau's true character, which had long been unknown to any but his intimate and confidential friends, was developed; and he appeared before the public as a "writer of ſatires." He began with ridiculing the numerous tribe of bad writers, and he thus excited a hoſt of enemies. Among others the duke de Montauſſer reproached him on account of the ſeverity of his perſonal ſatires as injurious to ſociety; but he contrived to diſarm his enmity by a ſingle ſtroke of flattery, which verified, ſays D'Alembert, the lines of La Fontaine:

"Amuſe the great with adulation,
Your praiſe to all their faults extend,

Whate'er

What'er their former indignation,
The bait goes down, and you're their friend."

Twelve of his satires were published; one of these was his satire against women, the most bitter and outrageous of all, which is said to have been occasioned by his having been in early life jilted by a young person to whom he was going to be married, and who ran away with a mosquetaire. Racine the younger, one of his particular friends, however, says, that he never had a mistress, nor ever thought of marrying. On the publication of this satire he was attacked from all quarters; but his friend Racine consoled him as well as he could: "Courage," says he, "you have attacked a numerous corps, which is all tongue; but the storm will blow over." The best of his satires was that entitled "A son Esprit;" a piece of irony, abounding with the most keen and polished ridicule. Whatever reproach Boileau incurred for the personality of his satires, it is mentioned to his honour, that he always distinguished between folly and vice; and that he never attacked bad taste and dunces with any other arms than ridicule, while vice and profligacy were treated by him with just indignation.

The satires of Boileau were followed by his "Art of Poetry," which is reckoned the best of all the poetical works of criticism existing, equally admirable for the good sense of its maxims, and the appropriate beauties of language by which his precepts are exemplified. This was succeeded by his "Epistles," formed after the model of Horace, and rendered peculiarly pleasing by the union of morality with criticism, and description with sentiment; interspersed with characteristic traits and anecdotes of himself. In one of these, addressed to the king, he artfully, at the instigation of Colbert, endeavoured to divert the sovereign's mind from the schemes of conquest to the glory of promoting the welfare of his subjects by plans of utility and beneficence. Lewis was gratified by the delicate praise with which this advice was accompanied, and applauded the epistles; but went to war with Holland. In 1674, he published his "Lutrin," a mock-heroic kind of composition, founded on a trifling dispute between the treasurer and chanter of the holy chapel, and ranking among the first productions of this class. Boileau had now acquired a degree of reputation which recommended him to favour and patronage at court; and the king honoured him with a pension, an exclusive privilege for printing his own works, and the office, conjointly with his friend Racine, of royal historiographer. In this latter capacity, neither he nor his associate had an opportunity of appearing before the public. Boileau, indeed, published his "Ode on the taking of Namur," which is more an historical than a poetical effort. At this time he attended frequently at court; and yet he maintained a freedom and frankness of speech, more especially on topics of literature, which are not common among courtiers. When Lewis asked his opinion of some verses which he had written, he replied; "Nothing, sire, is impossible to your majesty; you wished to make bad verses, and you have succeeded." He also took part with the persecuted members of the Port-royal; and when one of the courtiers declared, that the king was making diligent search after the celebrated Arnauld, in order to put him in the Bastile, Boileau observed, "His majesty is too fortunate; he will not find him:" and when the king asked him, what was the reason why the whole world was running after a preacher, named le Tourneux, a disciple of Arnauld, "Your majesty," he replied, "knows how fond people are of novelty: —this is a minister who preaches the gospel." Boileau appears, from various circumstances, to have been no great friend to the Jesuits, whom he offended by his "Epistle on the Love of God," and by many free speeches. By royal favour, he was admitted unanimously, in 1684, into the French academy, with which he had made very free in his epigrams; and he was also associated to the new Academy of Inscriptions and Belles Lettres, of which he appeared to be a fit member by his "Translation of Longinus on the Sublime." To science, with which he had little acquaintance, he rendered, however, important service by his burlesque "Arret in favour of the University, against an unknown personage called Reason," which was the means of preventing the establishment of a plan of intolerance in matters of philosophy. His attachment to the ancients, as the true models of literary taste and excellence, occasioned a controversy between him and Perrault concerning the comparative merit of the ancients and moderns, which was prosecuted for some time by epigrams and mutual reproaches, till at length the public began to be tired with their disputes, and a reconciliation was effected by the good offices of their common friends. This controversy laid the foundation of a lasting enmity between Boileau and Fontenelle, who inclined to the party of Perrault. Boileau, however, did not maintain his opinion with the pedantic extravagance of the Daciers; but he happily exercised his wit on the misrepresentations of the noted characters of antiquity, by the fashionable romances of the time, in his dialogue entitled "The Heroes of Romance," composed in the manner of Lucian. In opposition to the absurd opinion of father Hardouin, that most of the classical productions of ancient Rome had been written by the monks of the 13th century, Boileau pleasantly remarks, "I know nothing of all that; but though I am not very partial to the monks, I should not have been sorry to have lived with friar Tibullus, friar Juvenal, Dom Virgil, Dom Cicero, and such kind of folk." After the death of Racine, Boileau very much retired from court; induced partly by his love of liberty and independence, and partly by his dislike of that adulation which was expected, and for which the close of Lewis's reign afforded more scanty materials than its commencement. Separated in a great degree from society, he indulged that austere and misanthropical disposition, from which he was never wholly exempt. His conversation, however, was more mild and gentle than his writings; and, as he used to say of himself, without "nails or claws," it was enlivened by occasional sallies of pleasantry, and rendered instructive by judicious opinions of authors and their works. He was religious without bigotry; and he abhorred fanaticism and hypocrisy. His circumstances were easy; and his prudent economy has been charged by some with degenerating into avarice. Instances, however, occur of his liberality and beneficence. At the death of Colbert, the pension which he had given to the poet Corneille was suppressed, though he was poor, old, infirm, and dying. Boileau interceded with the king for the restoration of it, and offered to transfer his own to Corneille, telling the monarch, that he should be ashamed to receive his bounty while such a man was in want of it. He also bought, at an advanced price, the library of Patru, reduced in his circumstances, and left him in the possession of it till his death. He gave to the poor all the revenues he had received for eight years from a benefice he had enjoyed, without performing the duties of it. To indigent men of letters his purse was always open; and at his death he bequeathed almost all his possessions to the poor. Upon the whole, his temper, though naturally austere, was, on many occasions, kind and benevolent, so that it has been said of him, that he was "cruel only in verse;" and his general character was distinguished by worth and integrity, with some alloys of literary jealousy and injustice.

juſtice. He died of a dropſy in the breaſt in 1711, at the age of 75, and bequeathed the greater part of his property to charitable uſes. His funeral was attended by a very conſiderable number of perſons of rank and literature. How came this man (exclaimed a woman in the ſtreet) to have ſo many friends? They ſay he never ſpoke well of any body in his life.

As a poetical writer, he has been denominated the "poet of good ſenſe," correct in his verſification, choice and pure in his language, juſt and rational in his ſentiments, always guided by judgment and taſte, obſerving the limits of decorum, and never betrayed by wit or fancy into extravagancies. Few, if any writer, ever compoſed ſo much, with ſo little occaſion for eraſement or alteration. Voltaire, who often denied the equity of his deciſions in matters of criticiſm, ſays of him, in a letter to Helvetius; "I agree with you that Boileau is not a ſublime poet; but he executed admirably whatever he undertook. He is clear, eaſy, happy in his expreſſion; he ſeldom riſes very high, but he never ſinks. Beſides, the ſubjects of which he treats are not of a kind to require great elevation.——I ſhall, therefore, always warmly recommend that kind of writing which he has ſo well taught, that reſpect for language, that quick ſucceſſion of ideas, the art and facility with which he conducts his reader from one ſubject to another; and above all, his ſimplicity, which is the true fruit of genius." Boileau, was the firſt writer who formed the national taſte of France, and by his tranſlations and imitations gave his countrymen a true reliſh for the epiſtles and ſatires of Horace, which before his time uſed to be much leſs eſteemed than his odes. The great defect of Boileau, according to D'Alembert, is want of ſenſibility; and if enthuſiam, which is incompatible with that coldneſs of heart that diſtinguiſhed his character, is eſſential to a true poet, his claim to this honourable appellation muſt be diſallowed. Nevertheleſs, his works may be juſtly regarded as maſter-pieces of their kind, and can never die, as long as the language in which they are written exiſts. Having taken great pains in the compoſition of them, he was not inſenſible of their peculiar and characteriſtic excellence; accordingly, in ſome lines written by himſelf, and intended to be placed under his portrait, he makes no heſitation in affirming that he had united the merits of Perſius, Juvenal, and Horace. Boileau and Pope have been thought much to reſemble one another, as to both the kind and diſcriminating character of their writings; but, ſays a very competent judge, "Boileau, with a nearly equal portion of wit, has much more delicacy and correctneſs; while Pope as much ſurpaſſes him in force and fancy. Both abound in good ſenſe, and each has enriched his language with nervous lines that have paſſed into proverbial ſentences." In another place the ſame writer obſerves, that after we have rendered to Boileau Deſpreaux all due homage as a great poet, and as the legiſlator of taſte, his faults as a ſatiriſt indicate an acrimonious and unfeeling character, a high conceit of his own powers and conſequence, and an unpardonable diſregard of the happineſs and reputation of others. "If the Engliſh poet had as much cauſticity as the French, and more peeviſh irritability, he ſeems to have had a more feeling heart, and a nicer ſenſe of juſtice." We may remark, that perſonal ſatire ſoon loſes its ſalt and poignancy: and that the ſatires of Boileau, as well as the Dunciad of Pope, are leſs read now than any of their other works.

Beſides the works of Boileau, already mentioned, there are ſeveral ſmaller pieces both in proſe and verſe. Of the whole there have been various editions, with explanatory notes; and of theſe the principal are that of Geneva, 2 vols. 4to. 1716, with illuſtrations, by Broſette; that of the Hague, with Picart's figures and notes, 2 vols. fol. 1718, and 4 vols. 12mo. 1722; that by Allix, with Cochin's figures, 2 vols. 4to. 1740; and that of Durand with illuſtrations, by St. Marc, 5 vols. 8vo. 1747.

Boileau had ſeveral brothers of very ſingular characters. *James*, a doctor of the Sorbonne, was born in 1635, ſtudied in the univerſity of Paris, took his degree of doctor in theology in 1662, was appointed dean of Sens, and vicar of the archbiſhop Gondoin, in 1667; and in 1694, was preſented by the king with a canonry in the holy chapel of Paris. He died dean of the faculty of theology in 1716. He is well known by a number of works in a peculiar ſtyle, ſome of which were not remarkable for decency; but theſe he wrote in Latin, "leſt the biſhops," he ſaid "ſhould condemn them." He was not more a friend to the Jeſuits than his brother; and he deſcribed them as "Men who lengthened the creed, and ſhortened the commandments." As dean of the chapter of Sens, he was appointed to harangue the celebrated prince of Condé, when he paſſed through the city. This great commander took particular pleaſure on theſe occaſions in diſconcerting his panegyriſts; but the doctor, perceiving his intention, counterfeited great confuſion, and addreſſed him in the following manner: "Your highneſs will not be ſurpriſed, I truſt, at ſeeing me tremble in your preſence at the head of a company of peaceful prieſts; I ſhould tremble ſtill more, if I was at the head of 30,000 ſoldiers." He manifeſted a contempt of fanaticiſm, as well as of decorum, by his "Hiſtoria Flagellantium, &c." or, an account of the extravagant, and often indecent, practice of diſcipline by flagellation, in the Chriſtian church. It was tranſlated into French; and not many years ago (viz. 1777, 4to. and again in 1782, 8vo.) by M. de Lolme, into Engliſh. In his treatiſe "De antiquo jure preſbyterorum in regimine eccleſiaſtico," he diſcovers the greateſt freedom of ſentiment, endeavouring to ſhew, that in the primitive times the prieſts participated with the biſhops in the goverment of the church. He was alſo the author of ſeveral other publications, diſplaying much curious learning and a ſatirical turn, which are now conſigned to oblivion.

Gilles, the eldeſt brother of Boileau Deſpreaux, was born in 1631, and had a place in the king's houſhold. He was a man of wit and learning, and publiſhed a tranſlation of Arrian's Epictetus, with a life of the philoſopher, Paris, 1655, 8vo. He alſo publiſhed a tranſlation of Diogenes Laertius, in 2 vols. 12mo. 1668; and two diſſertations againſt Menage and Coſtar. His "Poſthumous Works" were publiſhed in 1670. He alſo wrote verſes, in no high eſtimation; and his poetical pretenſions excited a jealouſy of his brother's riſing fame, which produced an open variance between them. He was a member of the French academy; and died in 1669. Gen. Dict. Nouv. Dict. Hiſt. D'Alembert's Hiſt. des Membres de l'Acad. Franc. 1787, and Eloges, &c. 1779,—tranſlated by Aikin in 2 vols. 8vo. 1799.

BOILED, or Boyled *ſilks*, thoſe which have been put, while in the balls, into hot water, to make them wind the better.

In which ſenſe boiled ſilk ſtands oppoſed to raw.

BOILER, or Boyler, a large copper veſſel, wherein things are expoſed over the fire to be boiled.

The boiler, in the alum-works, is a veſſel, in which the liquor is evaporated to a conſiſtence, and is made of lead. The general ſize is about eight feet ſquare, and they contain about twelve tons each.

They make them in this manner: firſt, they lay long pieces of caſt-iron, twelve inches ſquare, as long as the breadth

breadth of the boiler, and at about twelve inches diſtance from one another. Theſe are placed twenty-four inches above the ſurface of the fire. On theſe maſſy bars of iron they lay, croſs-wiſe, the common flat bars of iron, as cloſe as they can lie together, and then make up the ſides with brick-work. In the middle of the bottom of this boiler is laid a trough of lead, wherein they put at firſt about a hundred pound weight of the rock. They uſe Newcaſtle coals in the boiling; and if they find the liquor not ſtrong enough, they add more of the rock at times, as it boils. Phil. Tranſ. N° 142.

The boiler for making colours, &c. muſt be made of pewter; becauſe iron and copper will be corroded by the ſaline ſubſtances uſed in the manufacture of them.

Count Rumford (ſee his Eſſays, vol. i. p. 220.) recommends double bottoms to boilers, and alſo to ſaucepans and kettles of all kinds, uſed for culinary purpoſes; which contrivance, he ſays, will, in all caſes, moſt effectually prevent what is called by the cooks, "burning-to." The heat is ſo much obſtructed in its paſſage through the thin ſheet of air which, notwithſtanding all the care that is taken to bring the two bottoms into actual contact, will ſtill remain between them, that the ſecond has time to give its heat as faſt as it receives it to the fluid in the boiler; and conſequently it never acquires a degree of heat ſufficient for burning any thing that may be upon it. He ſuggeſts that it will probably be beſt to double copper ſaucepans and ſmall kettles throughout: and as this may and ought to be done with a very thin ſheet of metal, it would not coſt much, even if the lining were to be made of ſilver. When the two ſheets of metal that form the double bottoms of boilers are made to touch each other throughout, by hammering them together, after the falſe bottom has been fixed in its place, they may be tacked together, by a few ſmall rivets placed here and there, at conſiderable diſtances from each other; and when this is done, the boiler may be tinned. In this operation, if proper care be taken, the edge of the falſe bottom may be ſoldered by the tin to the ſides of the boiler, and thus the water or other liquids, put into the boiler, will be prevented from getting between the two bottoms. The Count adds, that this invention of double bottoms might be uſed with great ſucceſs by diſtillers, to prevent their liquor, when it is thick, from burning to the bottom of their ſtills. (See STILL.) Having found in the courſe of his experiments, (See Phil. Tranſ. 1792. Part I.) that confined air is the beſt barrier that can be oppoſed to heat for the purpoſe of confining it, he propoſed to confine the heat in the boilers of his conſtruction, and to prevent its eſcape into the atmoſphere, by means of double covers. Theſe covers were made of tin, or rather of thin iron plates tinned, in the form of a hollow-cone; the height of the cone being equal to about one-third of its diameter; and thus the air which it contained was entirely ſhut up, the bottom of the cone being cloſed by a circular plate or thin ſheet of tinned iron. The bottom of the cone was accurately fitted to the top of the boiler, which it completely cloſed by means of a rim about two inches wide, which entered the boiler; which rim was ſoldered to the flat ſheet of tinned iron that formed the bottom of the cover. The ſteam, generated by the boiling liquid, was carried off by a tube about half an inch in diameter, which paſſed through the hollow conical cover, and which was attached to the cover, both above and below, with ſolder, in ſuch a manner that the air with which the hollow cone was filled remained completely confined, and cut off from all communication with the external air of the atmoſphere, as well as with the ſteam it generated in the boiler. For his various contrivances in the moſt advantageous conſtruction of boilers for the ſaving of fuel, and for producing the deſired effect, we refer to his Eſſays, vol. ii. p. 18, &c.

BOILERY, or BOILARY, in the *Salt Works*, denotes a ſalt-houſe, pit, or other place, where ſalt is made.

BOILING OF MEAT, in *Cookery*, is the expoſing of meat to the heat of boiling water, while it is immerſed in it for a certain time. By this joint application of heat and moiſture, the texture is rendered more tender and more ſoluble in the ſtomach; and it is only in this way, that the firmer parts, as the tendinous, ligamentous, and membranous parts can be duly ſoftened, and their gelatinous ſubſtance duly extracted. A moderate boiling renders the texture of animal fleſh more tender, without much diminution of its nutritious quality; but if the boiling is extended to extract every thing ſoluble, the ſubſtance remaining becomes leſs ſoluble in the ſtomach, and at the ſame time much leſs nutritious. But as boiling extracts in the firſt place the more ſoluble, and therefore the ſaline parts; ſo the remainder, after boiling, is in proportion to the continuance of the operation leſs alkaleſcent, and leſs heating to the ſyſtem.

Boiling is commonly practiſed in open veſſels, or in veſſels not cloſely covered; but it may be performed in digeſters, or veſſels accurately and tightly cloſed; and in ſuch veſſels the effects are very different from thoſe that take place in open veſſels. As we can hardly employ any other degree of heat than that of boiling water, the water in the digeſter is never made to boil, ſo there is no exhalation of volatile parts; and, although the ſolution is made with great ſucceſs, and may be to any degree required, yet if it be not carried very far, the meat may be rendered very tender, while it ſtill retains its moſt ſapid parts; and this kind of cookery will always give the moſt deſirable ſtate of boiled meat. Boiling, in the ordinary way, is different, according to the proportion of water that is applied. If a ſmall quantity be applied, and the heat in a moderate degree is continued for a long time, this is called "ſtewing," and has the effect of rendering the texture more tender, without extracting much of the ſoluble parts; and of courſe it leaves the meat more ſapid, and ſufficiently nouriſhing. Cullen's Mat. Med. vol. i. p. 400, &c.

BOILING, *ebullition*, in *Phyſics*, is the internal commotion excited in a maſs of water or other liquefied ſubſtance, by the ſucceſſive converſion of the lower portions of the fluid into vapour, and their violent effort under this expanſive and elaſtic form to make their eſcape. It is uſually, though not neceſſarily, produced by the application of heat. The circumſtances which precede or accompany the phenomenon of boiling, are beſt obſerved in a thin tranſparent flaſk nearly filled with water, and ſuſpended over a lamp or a charcoal fire. Numerous minute globules are ſeen collecting from all points towards the ſides and riſing in a ſtream to the ſurface; occaſioned evidently by the diſcharge of air, which is always in ſome proportion combined with water. As the heat increaſes, the liquid particles near the bottom of the flaſk ſuddenly burſt into ſteam, and ſhoot upwards; but in aſcending through the colder maſs, they again collapſe, ſtop their progreſs, and ſeem loſt. Such alternate expanſions and contractions, by throwing the fluid into a gentle tremor, frequently cauſes a peculiar ſort of ſinging noiſe, which is rightly ſuppoſed to betoken the approach of actual boiling. This ſinging is more likely to happen in the caſe where heat is applied partially; for inſtance, if a tea-kettle be placed at the ſide of the fire, ſince the heat is then more ſlowly and unequally diffuſed through the body of the water. But after the whole contents being fully penetrated, are warmed up to the requiſite degree of intenſity, the ſteam, as faſt as it is formed,

formed, aſcends continually and eſcapes unimpaired through the fluid, which it, therefore, heaves with violent agitation.

The ſame appearance almoſt is produced by removing or even diminiſhing the atmoſpheric preſſure. Thus, if a tumbler holding warm water be introduced under the receiver of an air-pump, as the exhauſtion proceeds, or the incumbent weight is gradually withdrawn, the latent portion of air is diſcharged in a rapid flow of expanded bubbles. But this proceſs, at ſome certain point of rarefaction, is ſucceeded by the vehement commotion which conſtitutes boiling; and the water, aſſuming its inviſible form, fills the imperfect void with vapour, which betrays its exiſtence by condenſing againſt the ſides of the receiver in copious dew. Nor is heat poſitively neceſſary towards vaporization, for it only conſpires in accompliſhing that effect, and ſupplies the want or the imperfection of our means of producing exhauſtion. By help of an air-pump of the beſt conſtruction, the coldeſt water may be made to boil, nay, ice itſelf could be changed into inviſible ſteam. Hence the utter impoſſibility of ever obtaining a perfect *vacuum*, becauſe the reſtraining influence of preſſure being entirely removed, the liquid matter unavoidably preſented would always diffuſe a thin vapour.

The oppoſite influence of heat and preſſure on the conſtitution of fluids is well exhibited by a very ſimple yet ſtriking experiment. Take a large thin phial, and having warmed it gradually to avoid the riſk of cracking the glaſs, fill it completely with boiling water, cork it tight, and expoſe it to a current of cold air. As the water cools, it neceſſarily contracts its volume, and leaving an imperfect vacuity below the neck of the phial, it hence becomes to a conſiderable degree relieved from the load of atmoſpheric preſſure. It therefore ſoon begins again to boil, nay, it will boil more briſkly the faſter it cools; and this ſingular appearance, ſo contrary to our uſual notions, may continue perhaps for the ſpace of half an hour, till the water has grown as cold almoſt as the temperature of the human body. On the ſame principle depends the conſtruction of what is called the *pulſe glaſs*: this conſiſts of two balls connected by a pretty long tube; one of theſe balls is filled with coloured water or ſpirits of wine, which having been made to boil and expel the air by its vapour, at the ſame inſtant the point projecting from the other ball is hermetically ſealed. As that vapour condenſes with cold, it will leave the included liquid then in a ſort of vacuum, and the heat of the hand is then ſufficient to cauſe it to boil and to flow from one ball into the other.

If a veſſel containing water be placed over a ſteady fire, the water will grow continually hotter till it reaches the limit of boiling, after which the regular acceſſions of heat are wholly ſpent in converting it into ſteam. The water therefore remains at the ſame pitch of temperature, however fiercely it boils. The only difference is that, with a ſtrong fire, it ſooner comes to boil, and more quickly boils away. Hence the reaſon why a veſſel full of water, and plunged into the centre of a larger one, which is likewiſe filled with that fluid, barely acquires the boiling heat, but will never actually boil.

The formation of ſteam occaſions a prodigious conſumption of heat; for if the time be noted in which water, by the action of a ſtrong fire, is raiſed from the limit of freezing to that of boiling, it will be found to require more than five times longer a ſpace to boil entirely away. Thus, a portion of heat correſponding to above 900 degrees by Fahrenheit's ſcale, is always conſumed in the act of boiling, or rather it is transferred and enters into the compoſition of ſteam, the gaſeous product. This abſorbed heat is as conſtantly evolved when ſteam condenſes and returns to its liquid form. Hence in diſtillation a very large refrigeratory is required for condenſing a comparatively ſmall quantity of aqueous or ſpirituous vapour. Hence too the explication of the familiar remark that ſteam ſcalds more cruelly than boiling water.

The heat of boiling water, being ſubject to the influence of the atmoſpheric preſſure, is thus not abſolutely fixed. It varies with the variation of the barometer, and decreaſes as the mercury deſcends. The extent of this fluctuation may in our changeable climate amount to five degrees by Fahrenheit's ſcale, the ſucceſſive difference of a degree correſponding nearly to each twentieth part of the remaining incumbent weight. On the tops of lofty mountains water will boil much ſooner than in the plains below. This curious fact has been noticed by ſeveral travellers, and was particularly obſerved by Sauſſure on the ſummit of Mont Blanc. A ſtill greater variation would be experienced on the peak of Chimboraco, the higheſt point of the Andes, where water would boil with a heat ſcarcely ſuperior to that which is commonly aſſigned for the boiling of ſpirits of wine.

It is therefore evident that, under an augmented preſſure, all liquids will more ſlowly reach the criſis of ebullition and will then have acquired a more intenſe heat. Thus water may be heated up many degrees above the mean point of boiling, if it be ſubjected to the action either of condenſed air or of confined ſteam. Such is the principle of *Papin's Digeſter*; which, being nearly filled with water, is ſhut perfectly cloſe, and ſet on a good fire. As the ſteam ſo formed is prevented from eſcaping, it neceſſarily concentrates, and exerting accumulated energy, it by its prodigious compreſſion enables the water continually to receive additional heat. Nor would this progreſs at all ſtop, till the elaſticity of the impriſoned vapour comes to ſurmount every obſtacle, and burſts the veſſel with terrible exploſion. Accidents of that ſort are extremely dangerous, and the experiment has conſequently never been puſhed to its utmoſt practicable limits. When the fracture takes place, not only the confined ſteam is liberated, but the preſſure being now removed, the exceſs of heat inſtantaneouſly converts a part or the whole of the water likewiſe into ſteam, which augments the general effect. This we may perceive in the burſting of a glaſs cracker; for the little baſe is ſhivered into atoms, and the water which it contained is entirely diſperſed, beating down flat the wick of the candle by the violence of the ſudden expanſive blaſt.

Hence the boiling heat of a deep cauldron is always rather greater than that of a ſhallow pan. This exceſs we might eſtimate at nearly one degree of Fahrenheit, for each foot of depth. The heat of ebullition muſt alſo riſe ſomewhat higher, if the ſteam be not allowed to eſcape as faſt as it is generated; for which reaſon there may be a ſlight difference of energy between rapid and ſlow boiling. Hence by the combined operation of both theſe cauſes, water deeply lodged in the bowels of the earth, or concealed under the dark bed of the ocean, is capable of acquiring the moſt intenſe heat from the action of ſubterranean fires; a principle of which Dr. Hutton has ingeniouſly availed himſelf in framing his Theory of the Earth.

But the poſition of the boiling point is likewiſe modified by the influence of chemical attraction. Thus ſugar, common ſalt, and other ſaline ſubſtances, have all of them a tendency to fix water and retard the criſis of its converſion into elaſtic vapour. Strong brine will not boil until it is heated up ſeveral degrees above the ordinary limit. Hence a veſſel containing freſh water, and immerſed in another which is filled with brine, will gently boil, while the ſurrounding fluid only ſimmers. On the other hand, the addi-

tion

tion of alcohol renders water more volatile. In the diſtillation of ſpirits, the fermented liquor in the copper boils always at a lower temperature, or at ſome intermediate point between the ebullition of water and that of alcohol. The ſpirituous fumes which riſe carry along with them a portion of evaporated water. Hence the neceſſity of rectification, or repeated diſtillations, to procure alcohol in its pureſt ſtate; for the boiling heat is lowered, and conſequently the proportion of aqueous admixture is diminiſhed, at each ſucceſſive proceſs. See DIGESTER, EBULLITION, FIRE, FLUID, HEAT, PRESSURE, STEAM, VAPOUR.

BOILING *of ſilk with ſoap*, is the firſt preparation in order to dyeing it. Thread is alſo *boiled* in a ſtrong *lixivium* of aſhes, to prepare it for dyeing.

Boiling is alſo a part of the proceſs for bleaching warp linen.

BOILING *to death*, *caldariis decoquere*, in the *Middle Age*, a kind of puniſhment inflicted on falſe coiners, thieves, and ſome other criminals.

This puniſhment was inflicted on thoſe who were guilty of murder by poiſon, 22 Hen. VIII. cap. 19. but this act was repealed by 1 Edw. VI. cap. 12.

BOILING is alſo a method of trying or aſſaying the goodneſs or falſeneſs of a colour of a dye, by boiling the ſtuff in water with certain drugs, different according to the kind or quality of the colour, to try whether or no it will diſcharge, and give a tincture to the water.

With this intention, red crimſon ſilks are boiled with alum, and ſcarlets with ſoap, in quantity equal to the weight of the ſilk.

BOILING *waters*, in *Natural Hiſtory*. See SPRING, and WATER.

BOINITZ, in *Geography*, a town of Hungary, eleven miles W.N.W. of Kremnitz.

BOJOBI, in *Zoology*, the Braſilian name of the Linnæan *Iræ caniua*.

BOIODURUM, in *Ancient Geography*, a town of Vindelicia, ſituate on the Danube, according to Ptolemy; the Itinerary of Antonine places it on the route from Ovilabis to Auguſta Vindelicium, between Stanacum and Quintianæ.

BOIOHEMUM, or BOIMUM, the country of the Boii, anſwering to the preſent *Bohemia*, which ſee. On the ſouth of it lay the "Gabreta Sylva," and to the ſouth, weſt, and north, the "Hercynii montes." The interior of it was penetrated with difficulty, and was little known.

BOJOWKA, in *Geography*, a town of Poland, in the palatinate of Braclaw, forty-eight miles eaſt of Braclaw.

BOIQUIRA, in *Zoology*, a name by which the natives, in ſome parts of America, call the *rattle ſnake*. Suppoſed to be the *Crotalus horridus*, of Naturaliſts.

BOIREL, ANTHONY, in *Biography*, born at Argentan, in Normandy, about the year 1625, applied himſelf to the practice of ſurgery, in which he acquired conſiderable reputation. In 1677 he publiſhed "Traité de plaies de tête," 8vo. extracted principally from the works of Hippocrates, Galen, and of Ambroſe Paré, which he appears to have ſtudied diligently. He has added ſome improvements to their practice.

Nicholas Boirel his brother, phyſician at Argentan, publiſhed, in 1702, "Nouvelles obſervations ſur les maladies veneriennes," 12mo. Paris, which was reprinted 1711, but contains little new on the ſubject. Haller Bib. Eloy. Dict. Hist.

BOIS, CARDINAL DU. See DUBOIS.

BOIS, GERARD DU, a member of the congregation of the Oratory, and a Latin profeſſor in it, was born at Orleans, in 1620. Having ſucceeded father Le Comte, in his place of librarian to St. Honoré, and having poſſeſſion of his papers, he finiſhed for the preſs his eighth and laſt volume of the "Eccleſiaſtical Annals of France," which was printed in 1683; and in conſequence of it he obtained a penſion from the French clergy. He afterwards undertook to write the hiſtory of the Pariſian church; and, in 1690, publiſhed the firſt volume in folio. The ſecond, which he did not live to finiſh, appeared after his death, which happened in 1696. This work is written in pure elegant Latin, and contains a variety of intereſting facts relating to civil as well as eccleſiaſtical hiſtory. Nouv. Dict. Hist.

BOIS, BOYS, or BOYSE, JOHN, an eminent divine, and one of the tranſlators of the bible in the reign of James I. was born at Nettleſtead in Suffolk, in 1560, and made ſuch early proficiency under the inſtructions of his father, that at the age of five years he read the bible in Hebrew, and at ſix, wrote that language in a fair and elegant character. At the age of 14 he was admitted into St. John's college, Cambridge, and by his great ſkill in the Greek language obtained a ſcholarſhip before he had been half a year at college, and afterwards a fellowſhip. Declining the profeſſion of phyſic, for which he was intended, he devoted himſelf to the ſtudy of divinity, and was ordained in 1583. He officiated for 10 years in his college as principal Greek lecturer; and as an inſtance of his aſſiduous application, and of the early hours of ſtudy at that period, it is mentioned, that he voluntarily read a Greek lecture at four in the morning, which was attended by moſt of the fellows. On the death of his father he ſucceeded him in the rectory of Weſt-Stowe, near Bury, in Suffolk; but in 1596, he married the daughter of Mr. Holt, rector of Boxworth, in Cambridgeſhire, and having before reſigned Weſt-Stowe, took poſſeſſion of this living. In this ſituation the neglect of domeſtic economy involved him ſo much in debt, that he was under a neceſſity of ſelling his choice collection of books. Afterwards, however, he retrieved his affairs by keeping a boarding-ſchool; and was appointed one of the Cambridge tranſlators of the bible. (See BIBLE.) The part that fell to the lot of that claſs of divines, with whom he was connected, was the Apocrypha; and this he completed in four years, without deriving any advantage from it beſides his commons. He was afterwards appointed one of the ſix delegates who met at Stationers'-hall in London, for the purpoſe of reviſing the tranſlation, and who were employed for nine months in this buſineſs, with an allowance from the Stationers' company of 30s. a-week each. For the aſſiſtance which he gave to ſir Henry Saville, in the publication of St. Chryſoſtom's works, to which he devoted the labour of many years, he received the very inadequate recompence of a ſingle copy of the work. However, ſuch was his reputation, that he obtained, without ſolicitation, from Dr. Andrews, biſhop of Ely, a prebend in his cathedral, in 1615; and he was thus enabled to ſpend the laſt 28 years of his life in tranquil retirement. Although he was always a hard ſtudent, he publiſhed nothing; but left behind him many MSS. particularly a commentary on the greateſt part of the N.T. A work of which few copies were printed, and, therefore, little known, appeared after his death, under the following title "Johannis Boiſii veteris Interpretis cum Beza aliiſque recentioribus collatio in IV. Evangeliis, et Actis Apoſtolorum," London, 1655, 8vo. He ſuſtained the character of an excellent Latin writer, a profound ſcholar, a loyal ſubject, a ſtrict churchman, and a plain practical preacher. It was his practice to attend the public ſervice of the church twice, if not thrice a day; and his charity was as extenſive as his devotion was regular and conſtant. Although he devoted eight hours a day to ſtudy even in his old age, he preſerved his health by the exerciſe of walking, to which he had accuſtomed himſelf from his youth, by confining himſelf to two meals a day, dinner and ſupper, by ſitting or walking an hour after dinner before he went into his ſtudy, by occaſional faſting, ſometimes twice in a week, and

and ſometimes once in three weeks, and by not ſtudying after ſupper, particularly towards the cloſe of life, but diverting himſelf with cheerful converſation for two hours among his friends. When he was a young ſtudent at Cambridge, he received from the learned Dr. Whitaker theſe three rules for avoiding thoſe diſtempers which uſually attend a ſedentary life, to which he adhered with equal conſtancy and ſucceſs. The firſt was to ſtudy always ſtanding; the ſecond never to ſtudy in a window; and the third never to go to bed with his feet cold. Accordingly he attained the age of 84 years, and died in 1643. Biog. Brit.

Bois, Du, *Lake*, in *Geography*, lies in North America, to the north-weſt of lake Superior, and receives the river de la Pluie, in N. lat. 49°. It was formerly famous for the richneſs of its banks and waters, which abounded with all the neceſſaries of a ſavage life. The French had formerly ſeveral ſettlements in and about it; but it has ſince declined, though it is now recovering its priſtine ſtate. The few Indians who inhabit it might live very comfortably, if they were not ſo immoderately fond of ſpirituous liquors. This lake is rendered remarkable by its having been named on the part of the Americans, as the ſpot from which a line of boundary between them and Britiſh America was to run weſt till it ſtruck the Miſſiſſippi, which, however, as Mr. Mackenzie obſerves, can never happen, becauſe the N. W. part of the lake du Bois is in N. lat. 49° 37′. and W. long. 94° 31′. and the northernmoſt branch of the ſource of the Miſſiſſippi is in N. lat. 47° 38′ and W. long. 95° 6′. aſcertained by Mr. Thomſon, aſtronomer to the North-weſt company, who was ſent expreſsly for that purpoſe in the ſpring of 1798. He, in the ſame year, determined the northern bend of the Miſſiſoury to be in N. lat. 47° 32′. and W. long. 101° 25′. and according to the Indian accounts, it runs to the ſouth of weſt, ſo that if the Miſſiſoury were even to be conſidered as the Miſſiſſippi, no weſtern line could ſtrike it. It does not appear, ſays Mackenzie, to be clearly determined what courſe the line is to take, or from what part of lake Superior it ſtrikes through the country to the lake du Bois; if it were to follow the principal waters to their ſource, it ought to keep through lake Superior to the river St. Louis, and follow that river to its ſource; cloſe to which is the ſource of the waters falling into the river of lake la Pluie, which is a common route of the Indians to the lake du Bois; the St. Louis paſſes within a ſhort diſtance of a branch of the Miſſiſſippi, where it becomes navigable for canoes; and if the navigation of the Miſſiſſippi is conſidered as of any conſequence by this country, from that part of the globe, ſuch is the neareſt way to get at it. The lake du Bois is nearly round, and the canoe courſe lies through the centre of it, among a cluſter of iſlands, ſome of which are ſo extenſive that they may be taken for the main land. The reduced courſe would be nearly north and ſouth. But, according to the navigating courſe, the diſtance is 75 miles, though in a direct line it would not be ſo long. At about two-thirds of it there is a ſmall carrying place where the water is low. The carrying place out of the lake is on an iſland, and named Portage du Rat, in N. lat. 49° 37′. and W. long. 94° 25′. and is about 50 paces long. The lake diſcharges itſelf at both ends of this iſland, and forms the river Winipic, which ſee. Mackenzie's voyage, &c. through the Continent of North America. Introd. p. 59.

Bois-*belle*, or *Henrichemont*, a ſmall ſovereignty of France before the revolution, ſituate in Berry, between Bourges and Sancerre, about 10 leagues in circuit, containing about 6300 inhabitants; its principal towns are Bois-belle and Henrichemont, which ſee.

Bois-*belle*, a town of France, in the department of the Cher, 15 miles N. E. of Bourges.

Bois *Blanc iſland*, ſituated in Upper Canada, lies in the ſtrait between lake Erie and lake St. Clair, containing from 150 to 200 acres of good land, covered with wood; the common channel, which is narrow, lies between it and the eaſt ſhore, and forms the beſt harbour in this country. This iſland commands the Detroit river from lake Erie. A wider ſhip-channel, though leſs frequented, lies on the weſt of the iſland.

Bois-*commun*, a town of France, and principal place of a diſtrict in the department of the Loiret, containing about 1600 inhabitants; 7 leagues N. E. of Orleans, and 5 W. of Montargis.

Bois, *Glacier des*, one of the lower Glaciers of the Alpine mountains adjoining to Mont Blanc, and the valley of Chamouny in Swiſſerland, from the thawed ice of which flows the river Arveron. This glacier is more than 15 miles long, and above three in its greateſt breadth. The general thickneſs of the ice was found by M. Sauſſure to be from 80 to 100 feet.

Bois-*le-duc*, or the *Duke's wood*, a city of Dutch Brabant, ſeated on the river Dommel, where it receives the waters of the Aa; ſo called from its ſituation in a woody country, to which the dukes of Brabant were accuſtomed to reſort for the purpoſe of hunting. The woods were cut down by order of Godfrey III. duke of Brabant; and he laid the foundation of a city in 1184, which was finiſhed in 1196, by his ſon duke Henry I. and much enlarged in 1352, 1453, and 1559. The city is encompaſſed by the Dommel and Aa, by the waters of which it may be eaſily inundated; and it is ſometimes inacceſſible except by boats. The principal forts that defend it are thoſe of Crevecœur, near the Meuſe; another called Iſabella; and a ſmall fort called St. Antoine, towards Brabant. It has alſo a caſtle, built by order of the States General, in the 17th century, as a check on the Roman catholics then more numerous than the reformed. It has four gates; and its walls are flanked with baſtions; the approach to it by land is on cauſeways, and by water at three gates or avenues. The cathedral, erected in 1366, and dedicated to St. John the Evangeliſt, is one of the moſt beautiful ſtructures in the Low Countries. Its wooden tower which was very lofty and ſupported by four ſtone pillars, was deſtroyed by lightning in 1584. It has had ſeveral other churches and monaſteries. This city ſuffered very much in the 16th century, during the religious wars; but at length the Dutch made themſelves maſters of it in 1629. Pope Paul IV. founded a biſhopric at Bois-le-duc in 1559, having juriſdiction over ten cities and 189 villages; the chief revenue of which aroſe from the abbey of Tongerlo. The diſtrict of Bois-le-duc, called "Mayerey," is ſituated between Holland and Guelderland, having Holland to the N., Upper Guelderland and the duchy of Cleves to the E., the quarter of Antwerp to the W., and the biſhopric of Liege to the S. It is divided into five ſmall diſtricts, and comprehends 102 villages, and three cities, Bois-le-duc, Helmont, and Eyndhoven. On the 14th of September 1794, an engagement took place near this town between the Britiſh army and the French, in which the latter were victorious; and on the 9th of October, in the ſame year, the town was taken by the French. It is 18 miles E. N. E. of Breda, and 42 S. S. E. of Amſterdam. N. lat. 51° 42′. E. long. 4° 59′.

Bois, *St. Marie, le*, a town of France, in the department of the Saone and Loire, and chief place of a canton, in the diſtrict of Charolles, 7 miles S. E. of Charolles.

Bois *d'Oignt*, a town of France, in the department of the Rhone, and chief place of a canton, in the diſtrict of Villefranche, 4½ leagues N. W. of Lyons. The place contains 900, and the canton 13,501 inhabitants; the territory comprehends 192½ kiliometres, and 18 communes.

BOISEAU, in *Commerce*, a meaſure of two buſhels and half of a peck at Bourdeaux in France.

BOISMONT, Nicholas Theinel de, in *Biography*, abbot of Greftain, preacher in ordinary to the king, doctor in theology, and member of the French academy, was born in 1715, and obtained great reputation for eloquence, particularly in the compofition of funeral orations. His principal works are, a panegyric of St. Lewis, and funeral orations on the Dauphin, on the queen of Lewis XV. and on that king himfelf. Thefe pieces are diftinguifhed by great fertility of ideas, a rapid and animated ftyle, lively and noble imagery, and philofophical reflection. On fterile fubjects, the orator exercifes too much art in decoration, and is too fond of antitheofes. He is reckoned, however, the moft eloquent of French orators in this department, and M. D'Alembert has alluded to him in a ftrain of high applaufe in his eulogy of Flechier. Nouv. Dict. Hift.

BOISROBERT, Francis le Metel de, a man of wit and pleafantry, much favoured by cardinal Richelieu, was born at Caen in 1592, and contributed much to the eftablifhment of the French academy, of which he was a member. He wrote poems, comedies, tragedies, tales, letters, romances, &c. which fucceeded for a time, but are now almoft forgotten. He was the amufing companion of Richelieu, and gained by his buffooneries the abbacy of Chattillon-fur-Seine, though his habits were far from being clerical. He was generous and beneficent, and took pleafure in ferving men of letters. He died in 1661. Nouv. Dict. Hift.

BOISSARD, John James, an eminent antiquary, was born at Befançon in 1528, and travelled for the purpofe of collecting antiquities, into Italy, the ifles of Corfu, Cephalonia, and Zante, and the Morea. After his return home, he was made governor to the fons of the baron de Clervaut, and travelled with them into France, Germany, and Italy. Having loft a great part of his valuable collection at Montbelliard, when the Lorrainers ravaged Franche Comté, he took pains in repairing his lofs, and publifhed his great work, much valued by antiquaries, and now fcarce, entitled "De Romanæ urbis topographia et antiquitate," in 4 vols. fol. 1597—1602, enriched with many engravings by Theodore de Bry, and his fons. He alfo publifhed a work, entitled "Theatrum vitæ humanæ," 1597—1599, 4to. confifting of the lives of 198 illuftrious perfons with their portraits. His "Book of Emblems" was publifhed, with figures, by Theodore de Bry, in 1593, 4to. His Latin verfes were inferted by Gruter, in the "Deliciæ Poetarum Gallorum;" and after his death was printed his work "De Divinatione et magicis præftigiis," fol. He finally fettled at Metz, and died there in 1602. Gen. Dict. Nouv. Dict. Hift.

BOISSEAUX, in *Geography*, a town of France, in the department of the Loiret, 4 leagues N. of Neuville.

BOISSEZON *d'Aumontel*, a town of France, in the department of the Tarn, and chief place of a canton in the diftrict of Caftres, 2½ leagues E.S.E. of Caftres.

BOISSIERE, La, a town of France, in the department of the Somme, and chief place of a canton, in the diftrict of Montdidier, 2 leagues E.N.E. of Montdidier.

BOISSIEU, Bartholomew, Camillus de, fon of a phyfician at Lyons, was born in the year 1734. His father dying when he was only fix years of age, his mother is faid to have taken on herfelf the care of his education, until he was fufficiently advanced to be fit to be fent to Montpellier. Paffing through the ufual ftages, in 1756 he was admitted doctor in medicine, and went thence to Paris, where he continued his ftudies for twelve months longer. He here became acquainted with Sauvages, with whom he afterwards kept up an epiftolary correfpondence. He now returned to Lyons, and was admitted of the college of phyficians, and attained to confiderable practice. His career was however fhort, for he died in 1770, aged only 36 years. He was author of two differtations, the one on the power of antifeptic medicines, the other containing a comparative view of the cordial or heating, and the cooling or antiphlogiftic, mode of treating fevers, and gives the preference to the latter. He received for each of them a medal from the academy at Dijon. They were publifhed in the years 1770, and 1772. Eloy. Dict. Hift.

BOISSY, Louis de, a dramatic writer of France, was born at Vic, in Auvergne, in 1694, and though originally deftined for the church, indulged his more prevalent inclination to the theatre. His firft performance was a tragedy, which failed of fuccefs: but he was more profperous in comedy. His beft pieces are "L'Impatient," "Le François a Londres," "Les Dehors Trompeurs," "Le Babillard," "La Surprife de la Haine," "Le Compte de Neuilli," and "La Piece fans Titre." Boiffy's diftinguifhing merit confifted in availing himfelf of the ridicule of the day. His verfes are often ingenious, but his plots are defective. He became a member of the French academy in 1751: and had the honour of reviving the credit of a periodical publication, called the French Mercury. He died in 1758. His dramatic works have been collected in 9 volumes, 8vo. Nouv. Dict. Hift.

Boissy, *St. Leger*, in *Geography*, a town of France, in the department of the Seine-et-Oife, and principal place of a canton, in the diftrict of Corbeil; the place contains 470, and the canton 14,224 inhabitants; the territory comprehends 177½ kiliometres, and 26 communes.

BOISZKY, a town of Poland, in the palatinate of Bielik, 12 miles S.W. of Bielik.

BOITIAPO, in *Zoology*, a fort of ferpent that inhabits Brafil, and is called by the Portuguefe *cobra de cipo*. This is an ambiguous fpecies. It is defcribed as being feven or eight feet long, as thick as a man's arm, round, and pointed towards the tail, like a fhoemaker's awl. The body covered with fine fub-triangular fcales, the colour olive and yellowifh. It lives on frogs, and muft be of the poifonous kinds, fince its bite is repreefented dangerous.

BOITMANZDORF, or Boesdorf, in *Geography*, a town of Silefia, in the principality of Neyfz, 5 miles N.N.E. of Neyfz.

BOITZENBURG, a town of Germany, in the circle of Upper Saxony, and Ucker Marck of Brandenburg, 8 miles S.W. of Prenzlow.

Boitzenburg, or Botzenburg, a town of Germany, in the circle of Lower Saxony, and duchy of Mecklenburg, at the conflux of the Boitze and the Elbe. It was furrounded with walls in the 14th century; at this town, veffels that paf the river pay a toll, producing annually 40,000 dollars, of which the duke of Mecklenburg-Strelitz is entitled to 9000; 3 leagues E. of Lauenburg.

BOIVIN, Louis, in *Biography*, a diftinguifhed fcholar and penfionary of the academy of belles lettres, was born at Mentreuil l'Argilé in Upper Normandy, and educated, firft under the Jefuits at Rouen, and afterwards at Paris, where he fettled. His acquirements in literature were various and extenfive; but his temper, according to his own account, was intractable and unfocial, enterprifing, vain, and verfatile. He was employed by feveral eminent magiftrates as the affociate and director of their private ftudies; but the litigiofnefs of his difpofition involved himfelf in great trouble and expence. He publifhed fome learned differtations on hiftorical fubjects, in the "Memoirs of the Academy of Belles Lettres;" and made great progrefs towards a new edition of Jofephus. He died in 1724, aged 75 years.

Boivin, John, a younger brother of the preceding, was born in 1682, and instructed by his brother, established his reputation as a man of letters at Paris, at the age of 18 years. His disposition was a counterpart to that of his brother, and he was much esteemed for his amiable temper and manners. The abbé de Louvois assigned him a considerable pension, and in 1714 procured for him the place of under-keeper of the king's library. In 1721, he was admitted member of the French Academy, and became pensionary of that of belles lettres in 1724, on the death of his brother. He excelled in the Greek language, of which he was professor in the royal college. His printed works are "An apology for Homer, and the shield of Achilles," 12mo: a French translation of "Homer's Batrachomyomachia;" a French translation of the "Oedipus of Sophocles, and the birds of Aristophanes;" "Greek Poems," much admired for their anacreontic delicacy; an edition of the "Mathematici Veteres," 1693, fol.; a Latin "Life of Claude Pelletier;" a Latin translation of the "Byzantine History of Nicephorus Gregoras, with notes," 1702, which is esteemed faithful, learned and elegant. He also published several dissertations on historical and literary topics in the "Memoirs of the Academy of Belles Lettres." He died in 1726. Nouv. Dict. Hist.

BOIUM, in *Ancient Geography*, one of the four principal cities of the Doride country in Greece. It was seated on the river Pindus, to the east of Erineus.

BOKEA, in *Botany*, (Aubl. Guian. Sup. 38. t. 391.) fructification unknown.

Species. B. *pronacensis*. A tree sixty feet high, three feet and a half in diameter. *Trunk* with a greyish, smooth bark, throwing out at its summit a great number of branches, some upright, others inclining, and almost horizontal, which spread in all directions. *Leaves* alternate, oval lanceolate, entire, terminated by a long, tender point, smooth, firm, green, on short petioles; two caducous stipules at the base of each petiole; the exterior part of the wood is white, the interior brown, intermixed with yellowish green. The latter is very firm and compact. It is a native of Guiana. See La Marck, Encyc. Method.

BOKELMAN, John Frederic, in *Biography*, published the beginning of the last century at Leyden, "Medicus Romanus servus, sexaginta solidis æstimatus." On this subject, a most interesting controversy was carried on some years after, between Drs. Mead and Middleton, in which many of the literati took part; and this dissertation, originally written to convey a censure on Drelincourt, was republished. The subject will be noticed again in the life of Dr. Mead. Haller Bib. Med.

BOKENEM, in *Geography*, a town of Germany, in the circle of Lower Saxony, and bishopric of Hildesheim, 16 miles S.S.E. of Hildesheim.

BOKET, a town of Germany, in the circle of Franconia, and bishopric of Wurtzburg, 4 miles N. of Kissingen.

BOKHARA, Bucharia, or Bogar, a famous city of Great Bucharia (see Bucharia), seated on the river Sogd, in that district, lying N.E of the river Jihon, or Oxus, called Sogdiana, or Al Sogd. It is situated very advantageously for trade, in a delightful and fertile country, and has repeatedly contested the metropolitan dignity with Samarcand. Besides its own wall, which was very strong, it had an outward inclosure, comprehending not only the suburbs, but a district about four leagues in extent on each side, which contained several villages and farms, watered by the river Sogd. The Sogd, which is the valley or plain of Samarcand on the east, and the mountain called Vorka on the north, were the boundaries of this territory; although its jurisdiction extended to several towns which were situated beyond its great wall. Mirkhond, in his history of the posterity of Japhet, affirms, that Bokhara was the capital of Turquestan, in the time of Oguz Khan, one of the most ancient kings of the Moguls, or Tartars, and reckoned by the Mahomeddan Tartars the eighth in descent from Japhet; and enumerates several towns which were dependent upon it. Bokhara afterwards became the capital of the state of the Samanides founded by Ismael, the great grandson of Saman, in the year of the Hegira, 297, or of Christ 909, under the caliph Motadhed. After the fall of the empire of the Samanides, the Moguls of Cathai made themselves masters of this city; but it was retaken by Mohammed, king of Karasm, in the year of the Hegira 594, or A.D. 1197. This conquest of the Karasmians alarmed the nations of the north, and drew towards Jihon very powerful armies of Moguls and Tartars, who desolated some of the finest provinces of Asia. In the year of the Hegira 617, or A.D. 1220, Jenghiz Khan, after a siege of some continuance, took this city, and ordered it to be set on fire; so that nothing of it remained, except the sultan's palace, called "Ark," constructed of stone, and some few private houses built of stone, all the rest having been wooden edifices. He then caused a search to be made in the palace and houses, and commanded all the soldiers, who had concealed themselves, to be put to death. Bokhara continued for some years in this desolate state; but at length the Khan ordered it to be rebuilt, not long before his death. In the year of the Hegira 772, A.D. 1370, Tamerlane took this city from sultan Hassain, who was the last prince of the house of Jenghiz Khan; and the Timurides, or descendants of Tamerlane, retained possession of it till about the year of the Hegira 904, A.D. 1498; when Babur was despoiled of all his territories in Transoxana and Khorasan by Schaibek Khan, who obliged him to fly to India; and from that time Bokhara has always belonged to the Usbeks, who have maintained it by frequent wars with the Persians. Herbelot Bib. Or. p. 190.

Bokhara was eminently distinguished in former times by the arts and sciences which flourished in it, and by its famous university, to which students resorted from all parts, and in which the celebrated Avicenna was educated. As an emporium of commerce, it was also no less famous. To this place merchants repaired from all parts of India, from the different countries inhabited by the Tartars, from Persia, and even from the dominions of the grand signior on one side, and from Russia and Poland on the other; so that in the warehouses and markets of this city might be seen a great variety of oriental and European merchandize. About the middle of the 16th century it was visited by Anthony Jenkins, an Englishman, whose curious and interesting account of the mart of this city has been translated into several languages, and copied by the best writers. See Hackluyt's Collection, p. 355. At that period, indeed, it sustained some injury from the vicinity of Samarcand; but since it became the seat of the khan of the Usbek Tartars, who is master also of Samarcand, which he visits only in the summer season, its commerce has revived, to which the convenience of its situation in no small degree contributes. When it was visited by the English agents in 1741, (see Hanway's Travels, i. 242.) it was large and populous, subject to its khan; standing on a rising ground, with a slender wall of earth; the houses of clay, but the numerous mosques of brick. The citizens manufactured soap and calico; and the chief products were cotton, rice, and cattle. From the Kalmuks they received rhubarb and musk; and from Badakshan, they used to receive lapis lazuli, and other precious stones; that city being computed at 16 days' journey from

Bokhara.

Bokhara. There was gold and copper coin; and after Nadir took this city, the Perſian and Indian ſilver became common. The inhabitants were civilized, but perfidious. In the 10th century it was diſtinguiſhed by the manufacture of fine linen. N. lat. 29° 24′. E. long. 62°.

BOKI, a river of Africa, which riſes in the country called Jallonkadov, between the heads of the Senegal and Joliba, and joins the Barchſing, or an arm of the Senegal, in the diſtrict of Brooko, in N. lat. 13° 11′. W. long. 8° 31′.

BOKIRA, a river of India, which runs into the ſea, 50 miles W. of Junagur.

BOKSAN, a town of Hungary, 10 miles ſouth of Lugos.

BOL, Ferdinand, in *Biography*, a painter of hiſtory and portrait, was born at Dort in 1611, educated at Amſterdam, and placed as a diſciple in the ſchool of Rembrandt. He was chiefly diſtinguiſhed by his portraits, which he painted in a free, bold manner, but not with that clearneſs of fleſh, and remarkable relievo, for which his maſter was famous. His colouring was too much tinged with brown in the carnations; but with this exception, his portraits had a great appearance of life and nature. As a painter of hiſtory, he manifeſted a good taſte of compoſition, as well as a tolerable expreſſion in ſome of his figures; but he was deficient in grace and elegance. His "Appointment of the 70 elders in the camp of the Iſraelites," and "Moſes breaking the tables of ſtone," in the council chamber of Dort, are well deſigned and executed. In the chamber of the burgomaſters there is an hiſtorical picture of "Fabricius in the camp of Pyrrhus," which is exceedingly admired. The etchings of this artiſt are bold and free. The following, from his own compoſitions, are generally much eſteemed; viz. "Abraham's Sacrifice," "St. Jerom, ſeated in a cavern, holding a crucifix," and a "Philoſopher, holding a book." Bol died in 1681. Pilkington and Strutt.

Bol, John, a painter of landſcapes, hiſtory, and animals, was born at Mechlin in 1534, and completed his ſtudies at Heidelberg. His ſubjects were views of ſeveral cities and towns in the Low Countries, and different proſpects of Amſterdam; and in his pictures the veſſels, with the reflections of them from the water, are admirably executed. His invention and compoſition were very pleaſing; his colouring poſſeſſes great harmony and union; and his manner of ſketching and pencilling is broad and free. Van Mander highly commends one of the paintings of Bol, in diſtemper, the ſtory of which is "Dædalus and Icarus." This artiſt etched a ſet of landſcapes, which are "views in Holland," in the ſtyle of a maſter. He died in 1593. Pilkington and Strutt.

BOLA, in *Ancient Geography*, a town of Italy, the capital of the country of the Æqui, ſituate, according to Plutarch, 30 miles from Rome. Pliny places it in Latium. See Æqui.

BOLABOLA, more uſually pronounced Borabora, in *Geography*, one of the Society iſlands in the ſouthern Pacific ocean, ſituate four leagues N. W. of Otaha, and inferior to it in extent, being about ſeven leagues in circumference. The reef that ſurrounds it is nearly full of iſlets, much larger than thoſe that are ſcattered among the rocks, encloſing Otaha and Ulietea. It differs from thoſe iſlands, and from Huaheine, in having only one harbour on its coaſt; whereas the ſhores of the others, being ſtrongly indented, form, like the coaſts of Eimeo, numerous places of ſhelter for ſhipping. It is alſo diſtinguiſhed by a very lofty, double-peaked mountain in its centre, and is more rude and craggy than the other Society iſles. Its eaſtern ſide appears barren; the weſtern is more fertile; a low border, which ſurrounds the whole, and alſo the iſlands on the reef, are productive and populous. Its earlieſt inhabitants are ſaid to have been malefactors baniſhed from the neighbouring iſlands. As their number rapidly increaſed, and their military proweſs gained reputation, they eſtabliſhed their authority in Ulietea and Otaha, and alſo in Maurōva and Toobāe. Their conqueſts acquired ſo much reſpect, that the ſuppoſed tutelary divinity of Bolabola, named Oorā, or Orāa, had been adopted by the people of Teiarraboo, in preference to two imaginary deities whom they formerly worſhipped. The Bolabolan warriors are punctured in a different manner from thoſe of the more eaſtern iſlands. Bolabola was diſcovered by captain Cook, together with the group called by him the "Society iſlands," in July 1769; but though he took poſſeſſion of it in the king's name, he did not land upon it either in his firſt or ſecond voyage. But in 1777, he landed on this iſland, notwithſtanding the account which he had received of its inhabitants, and was introduced to Opoone, who had been repreſented as a very formidable chief, but whom he found old and feeble, though ſtill much eſteemed and feared. Opoone was ſucceeded in his government of this and the neighbouring iſlands by his daughter, who, in 1774, at the age of 12 years, had been betrothed to a chief named Boba, who governed Otaha under Opoone, and was deſigned to ſucceed him in the ſovereignty. In 1791, when captain Edwards viſited Bolabola, a man named Tatahoo, had the chief authority. S. lat. 16° 32′ 30″. W. long. 151° 52′. Miſſionary Voyage, Introd. p. 41.

BOLACA, in *Ancient Geography*, a town of Peloppone-ſus in Triphylia, a country of Elis. Polybius.

BOLAVOSANSKA, in *Geography*, a town of Siberia, in the government of Irkutzk, 80 miles N. W. of Ilimſk.

BOLBACH, a river of Germany, in the duchy of Stiria, which riſes in a lake, 10 miles S. W. of Voitſberg, and runs into the Sulm, near Wipplefpach.

BOLBÆ, in *Ancient Geography*, a town of Aſia Minor, in Caria, called alſo Heracleæ.

BOLBE, a marſh of Macedonia, near the Ionian ſea, before Apollonia, according to Scylax.

BOLBEC, or Bollebec, in *Geography*, a town of France, in the department of the Lower Seine, and chief place of a canton, in the diſtrict of Havre; the place contains 4921, and the canton 14,171 inhabitants; the territory comprehends 105 kiliometres, and 18 communes.

BOLBENA, in *Ancient Geography*, the name of a country in Aſia, in the greater Armenia. Ptolemy.

BOLBITINA, a town of Egypt, ſituate near the ſecond mouth of the Nile, adjoining to the ſpot where Roſetta now ſtands.

BOLBITINUM *Oſtium*, a name given by Ptolemy and Pliny to the ſecond mouth of the Nile, from that of the town, Bolbitina, ſeated near the canal called "Tuli." The Bolbitine branch is now called that of Roſetta, Roſſetta, or Raſchid, which ſee. Strabo informs us (l. 17. tom. ii. p. 1153.) that under the reign of Pſammitichus, the Mileſians, with 30 veſſels, landed at the Bolbitine, or Bolbitic branch, and there fortified themſelves.

BOLBONACH, in *Botany*. See Lunaria.

BOLBULÆ, in *Ancient Geography*, a name given by Pliny to an iſland of Aſia Minor, ſituate on the coaſt of Ionia.

BOLCA, in *Geography*, a branch of the Tyroleſe Alps, ſituate 50 miles N.W. of Venice, and noted for foſſil fiſh, in argillaceous ſchiſtus.

BOLCHE-

BOLCHERETSKOI, a town of Kamſchatka. N. lat. 52° 54′ 30″. E. long. 156° 37′ 30″.

BOLCHOF, or Bolkof, a town and diſtrict of Ruſſia, in the government of Orel, ſeated on the river Nugra, falling into the Occa; 32 miles N.N.W. of Orel.

BOLD SHORE, in *Sea Language*, a ſteep coaſt or ſhore, ſo that ſhips may approach cloſe to it.

BOLDSON, an iſland of Sweden, in the province of Halſingland, having a good harbour.

BOLE, in *Mineralogy*, *Bol*, Germ. *Bol*. Fr. *Argilla bolus*, Werner. The colour of bole is generally an obſcure Iſabella yellow, or reddiſh, or whitiſh brown; it is alſo ſometimes, though rarely, met with of a greyiſh yellow, or fleſh-red; its ſurface is often marked with black ſpots and dendritic figures. It occurs generally maſſive, ſeldom diſſeminated. Internally it exhibits a ſlight glimmering luſtre. Its fracture is perfectly conchoidal. It flies, when broken, into irregular, ſharp-edged fragments. The dark coloured varieties are opaque, the lighter coloured are more or leſs tranſlucid. It has a greaſy feel; adheres ſtrongly to the tongue; gives a ſhining ſtreak; is very ſoft, and eaſily frangible. Sp. gr. 1. 4 to 2.

When put into water it abſorbs a portion with great eagerneſs, and then breaks down into ſmall fragments, with a very ſenſible crackling noiſe; but is not reduced to an impalpable powder. When finely pulverized, and diffuſed through boiling water, it remains ſuſpended in this fluid a much leſs time than any of the plaſtic clays, and is entirely ſeparable by the filter.

Before the blow pipe it turns black, and melts without addition, though with ſome difficulty, into a porous, greeniſh, grey ſlag.

According to a ſomewhat inaccurate analyſis of Bergman, the Lemnian bole contains

Siliceous Powder -	47.
Carbonated lime -	5.4
Carbonated magneſia -	6.2
Alumine - -	21.
Oxyd of iron - -	5.4
Moiſture and volatile matter	17.
	102.0

Bole occurs in beds of wakke at Strigau in Sileſia, and in baſalt at Scheibenberg in Saxony; it is found alſo in Tuſcany and Sienna in Italy, and in the iſland Lemnos in the Archipelago.

The only uſe of bole, at preſent, is as a coarſe red pigment; for which purpoſe it is calcined and levigated, and is vended in Germany under the names of Berlin and Engliſh red. Anciently, however, a very high rank was aſſigned to bole among the articles of the Materia Medica; it was conſidered as a powerful aſtringent, ſudorific, and alexipharmic, that from Armenia and Lemnos being particularly eſteemed. The Lemnian bole, in the time of Dioſcorides, was dug up in the preſence of the prieſts of Venus, and after being mixed by them with goats' blood, was moulded into cakes, which were impreſſed with the figure of a goat, in order to authenticate them; hence it was called Σφραγις αιγος, *ſigillum caprinum*: It ſtill continued to be a conſecrated remedy even in the 16th century; according to Belon, the vein was opened annually on the 6th of Auguſt, and after prayers ſaid by the prieſts, as much of the earth was taken out as was thought ſufficient for the enſuing year; the entrance to the vein was then cloſed, and the ſevereſt puniſhments were denounced againſt any one who ſhould open it without permiſſion. Part of the earth was ſent to Conſtantinople, where it was made up into ſmall cakes, and received the ſeal of the emperor; the remainder was prepared in the iſland itſelf, and was impreſſed with the ſeal of the governor. The profits of this manufacture were too conſiderable not to be encroached upon, and the bolar earths, and even the clayey marls of Italy, France, and Germany, obtained a place in the Materia Medica, under the general name of *Terræ ſigillatæ*, from which, however, they, together with the Lemnian earth, have, been at length deſervedly excluded.

Bole is alſo uſed for the body or trunk of a tree; and hence boling trees are thoſe whoſe heads and branches are cut off.

BOLEMOW, in *Geography*, a ſmall town of Poland, in the palatinate of Rawa.

BOLENA, a town of the Morea, in the duchy of Clarence, 5 leagues from the gulf of Lepanto; the ſee of a biſhop, ſuffragan of the archbiſhop of Patras.

BOLENBERG, a ſmall town of the duchy of Mecklenburg, on the Baltic.

BOLENE, or Bollene, a town of France, in the department of Vaucluſe, and chief place of a canton in the diſtrict of Orange, 3 leagues north of Orange. The town contains 4064, and the canton 10,852, inhabitants; the territory comphehends 132½ kiliometres, and 7 communes.

BOLENIÆ, or Bodæ, in *Natural Hiſtory*, a name given by ancient writers to a ſort of ſtone of a roundiſh figure, and marked with ſeveral ridges and lines. They are ſuppoſed to be the ſame with thoſe called *Brontiæ* and *Ombriæ*, both being imagined to fall from the clouds in time of thunderſtorms; but they are really no other than a common ſpecies of *Echinitæ*.

BOLERA, in *Geography*, a town of Spain in Arragon, 4 leagues from Hueſca.

BOLERAZ, a ſmall town of Lower Hungary, in the upper outward diſtrict of the county of Preſburg.

BOLESKO, a town of Hungary, 28 miles north of Topoltzan.

BOLESLAW, or Buntzlaw, a circle of Bohemia, on the confines of Luſatia and Sileſia, from which it is ſeparated by mountains. The capital is Buntzlaw.

BOLESLAWIEC, a town of Poland, in the palatinate of Siradia, 24 miles S.S.W. of Siradia.

BOLETUS, in *Botany* (Gr. βωλιτης, from its globular form), a genus of the claſs *cryptogamia*, and of the order *fungi*, formed by Linnæus, and diſtinguiſhed from the agarics by having what is generally the lower ſurface compoſed of tubes inſtead of gills. The name was given by the Romans to a ſpecies of eſculent fungus, eſteemed by them a great delicacy, and celebrated by their hiſtorians and poets for being the vehicle of the poiſon adminiſtered to Claudius Cæſar, by his wife the younger Agrippina. This has been generally ſuppoſed by modern botaniſts to be the *Agaricus xerampelinus*, thence called by Scheffer *Cæſareus*; but Withering thinks it was the *delicioſus* of Linnæus. See Agaric.

Among the moderns it was firſt adopted as a generic name by Tournefort, who applied it to the common morel, the fungus ſavaginoſus of ſome of the older botaniſts, afterwards referred by Linnæus to his genus phallus. La Marck, diſpleaſed with Linnæus for altering Tournefort's names, has reſtored the name boletus to the morel, and has ſeparated it from phallus on account of its not being perforated at its ſummit. He has, in conſequence, divided Linnæus's genus boletus into two; calling thoſe that are ſeſſile and woody, agaricus, and thoſe that are pedicelled and ſoft, ſuillus. The Linnæan agaricus he has named amanita, as Dillerius and Haller had done before him. Juſſieu and Poiret concur with him in theſe alterations. But this, as Boſc well obſerves (Nouveau Dictionaire,

Dictionaire, ſub voce Boletus), is to increaſe a confuſion already too great, and to overturn a nomenclature which has been generally adopted in Europe ſince the publication of the ſexual ſyſtem. For, however Linnæus may in ſome caſes have capriciouſly changed ancient names, and however it may be wiſhed that, in the preſent inſtance, he had called his boletus, agaricus, which would have preſerved to the officinal agaric its cuſtomary generic denomination, it is better to let things remain as they are, than again to unſettle the language of the ſcience, and thereby to impede its farther advancement. We ſhall, therefore, go on as we have begun, in adhering ſtrictly to the Linnæan nomenclature, where we are not induced to depart from it by weighty ſcientific reaſons.

Linnæus has enumerated only fourteen ſpecies, and Reichard has made no addition to the number. Gmelin has extended them to a hundred and ſeven; but there is reaſon to ſuſpect, that he has ſometimes given the ſame ſpecies more than once under a different name. The ſettling of ſynonyms is in every part of botany an intricate and often unſatisfactory buſineſs, but peculiarly ſo in the claſs *cryptogamia*. Withering, in the third edition of his Arrangement of Britiſh plants, has deſcribed fifty-one ſpecies, many of which have ſeveral varieties. In this number are included eight of the Linnæan ſpecies. He diſpoſes them under three grand diviſions, as they have central, lateral, or no ſtems; and ſubdivides them according to the colour of their tubes. None of them being cultivated, we ſhall confine ourſelves to thoſe which are of Britiſh growth.

Stem Central.

**Tubes white.* 1. B. *pellucidus*. "Tubes decurrent, very ſhort; pores minute, angular: pileus concave, rich brown, ſcaly; ſtem whitiſh, thick, ſhort." 2. B. *ſubfuſcus*. "Tubes very ſhort; pileus light brown, ſmooth, clothy to the touch, regularly convex; fleſh very white; ſtem pale brown, covered with a beautiful white net-work over its whole ſurface; root conical; reſembles the elephantinus in habit." 3. B. *cyaneſcens*. "Tubes browniſh with age, not decurrent; pileus brown, convex, very fleſhy; fleſh white, changing to a fine blue when expoſed to the air; ſtem brown, rounded at the baſe." 4. B. *polyporus*. "Tubes very ſhort; pores circular, extremely minute; pileus brown, irregular; fleſh very thin; ſtem brown, varying from perfectly central to perfectly lateral, tough, thickening upwards." 5. B. *leptocephalus*. "Tubes very ſhort; pileus tawny bay, flat, thin, leather-like; ſtem browniſh, thick as a crow-quill." Firſt obſerved in Britain by Mr. Dickſon, growing on rotten ſticks. 6. B. *aurantiacus*. "Tubes not decurrent, readily parting from the pileus; pileus convex, full orange-red, viſcid, thin at the edge, and without tubes for about one-tenth of an inch; ſtem whitiſh, rough, with coloured pimples, ſpongy, ſilken." It is eaten in France when young. **Tubes brown.* 7. B. *bovinus*, Linn. "Tubes not touching the ſtem, unequal in length; pileus thin at the edge, brown or olive, clammy, large; fleſh ſpongy, white; ſtem dirty white, with reddiſh ſtains, from three to ſeven inches high, and about an inch in diameter." It varies in the colour of its tubes and pileus, and in the ſmoothneſs or roughneſs of its ſtem. 8. B. *ſubſquamoſus*. "Tubes decurrent, oblong; pileus yellowiſh brown, with red brown, ſcurfy, ſcales, the centre hollowed; fleſh ſolid, pure white; ſtem browniſh, tapering downwards." 9. B. *perennis*, Linn. "Tubes decurrent, not ſeparating from the pileus, very ſhort; pileus flattiſh, hollow in the centre, ſtriated with hairs, marked with alternate circles of brown and tawny, leathery; ſtem red brown, often excentric, ſhort, wiry, frequently coming up ſo thick that the piles run into one another." There is a variety of a cinnamon colour, within and without, the B. *cinnamomeus* of Jacquin, firſt found in this kingdom by Mr. Dickſon. 10. B. *ſubtomentoſus*, Linn. "Tubes rather angular, of different ſhapes; pileus yellow, convex, fleſhy, ſomewhat woolly; ſtem yellow." 11. B. *rubeolarius*. "Tubes olive-colour, fixed to the ſtem; pores rich red brown, moſtly oval; pileus red cinnamon, convex, ſoft to the touch, rather clammy; fleſh thick, ſpongy, buff-colour, inſtantly turning blue when wounded; ſtem red cinnamon, ſpongy within, and rich yellow, but inſtantly changing to a blue." 12. B. *piperatus*. "Tubes decurrent, deep orange, or earthy red; pores browner, open, irregular; pileus yellow, ſmooth, nearly flat, thin at the edge; ſtem greeniſh yellow." Its pungency on the tongue and throat is like that of a capſicum. Firſt found in England by Mr. Sowerby, in Hainault foreſt, Eſſex. **Tubes buff.* 13. B. *nummularius*. "Tubes looſe from the ſtem, very ſhort; pores angular; pileus colour of brown horn, with a black circle at the edge, convex, dimpled, leathery, ſmooth, very thin, about an inch in diameter; ſtem colour of brown horn, black at the baſe, ſmooth." Chiefly found on rotten branches of hazle. 14. B. *nigripes*. "Tubes decurrent, very ſhort; pileus whitiſh, the ſize of a ſixpence; ſtem black at the bottom." **Tubes yellow.* 15. B. *elephantinus*. "Tubes ſhort, adhering firmly to the pileus; pileus dead white, convex, but very irregular; ſtem yellow, thick and ſhort." 16. B. *edulis*. "Tubes not fixed to the ſtem, readily parting from the pileus; pores circular, ſmall; pileus brown, with ruſt-coloured patches, nearly globular, ſeven or eight inches acroſs when fully expanded: fleſh white, greeniſh when wounded; ſtem light browniſh yellow, tapering upwards." Bulliard reckons it a variety of bovinus. 17. B. *gregarius*. "Tubes ſhort; pores oblong, unequal; pileus cheſnut, ſmooth, thin, flattiſh; fleſh white, about three inches over; ſtem pale cheſnut, pinky below, inſenſibly ſwelling into the pileus. 18. B. *luteus*. "Tubes readily ſeparating from the pileus; pores round, ſmall; pileus deep bay, rather conical, ſtriated, viſcid; fleſh white, not changing; ſtem dirty white, cylindrical, widening at top; ring permanent." 19. B. *olivaceus*: "Tubes inſtantly turning blue when wounded; pores bright yellow, round or oval; pileus olive-brown; fleſh bright yellow, turning blue when expoſed to the air; ſtem brown below, yellow or crimſon above." 20. B. *ſanguineus*. "Tubes a little decurrent, unequal in length, changing to deep blue; pores lemon-yellow, angular; pileus crimſon, changing to rich red brown, ſemi-globular; fleſh white, changing ſlowly to a bluiſh caſt when wounded; ſtem yellow, with broad crimſon ſtreaks, apparently twiſted." Found by Dr. Withering, near Birmingham, but only in one place. 21. B. *chryſenteron*. "Tubes decurrent; pileus gently convex, pinky-red; ſtem yellow below, pinky upwards, ſwelling in the middle." 22. B. *flavus*. "Tubes a little decurrent; pores irregular in ſhape and ſize; pileus convex, deep orange when young, ſhining with a viſcid varniſh; ſtem yellow, cylindrical; curtain white, leaving a ring." 23. B. *lactifluus*. "Tubes in contact with the ſtem; pores very minute; pileus reddiſh-buff, very convex, viſcid; ſtem bright yellow." The plant abounds with a mild milky juice. Its flavour is like that of the agaricus campeſtris. 24. B. *ſubſtrictus* "Tubes ſhort; pores minute; pileus yellow, brown, olive, convex, thin, ſmooth, leathery; fleſh thin, white; ſtem dirty yellow, hard, tough, ſometimes excentric.

Stem lateral.

**Tubes white.* 25. B. *albidus*. "Tubes decurrent, not perpendicular to the pileus; pores angular, very irregular in ſhape; pileus white, lobed; ſtem ſolid, ſometimes only a knob." The whole plant white, with a cottony ſubſtance,

which

which is easily rubbed off. 26. B. *rugosus* (*lucidus*, Curtis). "Pores very small; pileus chesnut coloured, shining, flat, marked with concentric grooves; edge thick, wrinkled; stem chesnut coloured, hard, uneven, shining." 27. B. *frondosus*. "Tubes decurrent; pores very small, sometimes confluent; pileus brown, lobed, tiled, leathery; stem black at the base, very irregular and mishapen; sometimes nearly two feet across." 28. B. *betulinus*. "Tubes very short; pileus pinky-brown, smooth, oblong, convex, thin, curled in at the edge; flesh white; stem black; whole plant leathery." 29. B. *cristatus*. "Tubes short, not separating; pores irregular; pileus golden yellow, variously shaped, jagged, curled; stem brown, woody, distorted, thick, porous." 30. B. *squamosus*. "Tubes short, slanting; pores large, angular; pileus pale buff, pencilled with feather-like scales; flesh firm, white, elastic; stem dark coloured, white within." * *Tubes yellowish*. 31. B. *rangiferinus*. "Tubes decurrent, ragged at the extremity; pileus an expansion of the stem, dirty yellow; stem dark brown, with one or more lateral branches, splitting at the end into several horn-shaped branches, either expanding into the pileus, or barren with yellow tops." The whole plant resembles the palmated branches of some of the larger species of deer. 32. B. *calceolus*. "Tubes decurrent; pores small, unequal; pileus deep buff to chesnut, of a substance like cork, hollowed in the middle, thin, and waved at the edge; stem tough, white, conical." 33. B. *lateralis*. "Tubes very short; pores very minute; pileus yellow, smooth, flat, very thin leathery; stem yellow, spreading out at the top to form the pileus."

Stemless.

* *Tubes white*. 34. B. *suberosus*. "Tubes pointed; pores irregular; pileus white, convex, thin, downy when young, smooth when old, perfectly resembling cork." 35. B. *medullapanis*. "Wholly white, crustaceous, spreading; pores small, on the upper surface only." On decayed wood and branches of trees. 36. B. *salicinus*. "Tubes very short; pileus semicircular, whitish, smooth, thin, soft, leathery." 37. B. *suaveolens* (*discoideus*, Dickson). "Tubes very long, changing first to straw-colour, then to tawny; pores irregular; pileus smooth, semi-circular, white or tawny; flesh yellow brown." 38. B. *spongiosus*. "Pores fringed, angular; pileus often very large, brown, woolly, turning quite black when old." 39. B. *lachrymans*. "Pileus orange coloured, wrinkled, reticulated, with a broad, white, arched border; pores chiefly on the upper surface of the white border." Frequent in damp cellars. 40. B. *versicolor*. "Tubes short, minute; pileus thin, velvety, striped with concentric circles of various colours." * *Tubes brown*. 41. B. *cuticularis*. "Tubes long; pores minute, rich yellow brown: pileus rich dark red brown, semicircular, very uneven, with concentric ridges." 42. B. *cryptarum*. "Tubes very long; pores minute; pileus leathery, thin, supine, becoming woody when old." 43. B. *labyrinthiformis*. "Tubes long; pores sinuous; pileus rugged, zoned, woody; lobes many from one root." 44. B. *unicolor*. "Tubes short; pores labyrinth-formed; pileus leathery, woolly, with different shades of the same colour. * *Tubes red*. 45. B. *laciniatus*. "Tubes very short; pileus brownish, arched, warty, thin, fringed at the edge." 46. B. *albitinus*. "Pores angular; pileus thin, gently convex, wrinkled, woolly, greyish, whiter at the edge." 47. B. *hispidus*. "Tubes fringed; pileus bright red brown, in old age black, rough with bristly hairs." Possibly a variety of the *velutinus*. * *Tubes yellow*. 48. B. *sulphureus*. "Tubes short; pores minute, irregular; pileus bright aurora, streaked." 49. B. *velutinus*. "Pores angular, irregular; pileus large, very irregular in shape, covered with a dense pile of a silvery grey colour." * *Tubes green*. 50. B. *igniarius*. "Tubes very slender; pores very fine, yellowish, changing to red brown; pileus shaped like a horse's hoof, smooth, red brown to blackish." It is the officinal agaric, the *agaric amadouvier* of La Marck. For the domestic and surgical uses to which it is applied, in different parts of the continent of Europe, and the manner in which it is prepared, see the article AGARIC, in *Pharmacy*. 51. B. *fomentarius*. "Pores circular, equal; pileus white, convex, thick at the edge, uneven."

To these La Marck adds the *agaricus quercinus* of Linnæus, and observes, that it properly belongs to this species; for though it has the appearance of gills, they are really tubes with large mishapen pores, which near the edge of the pileus have a more regular form. Bulliard and Woodward incline to the same opinion; and we ourselves have already suggested that it seems to connect the agarici with the boleti. See AGARICUS.

BOLETUS (Haller). See HELVELLA MITRA.

BOLETUS (Tournefort). See CLATHRUS CANCELLATUS.

BOLETUS (Tourn. Michel. and Haller). See PHALLUS ESCULENTUS.

BOLETUS (Gled.). See HYDNUM REPANDUM and AURISCALPIUM.

BOLI, or BOLLI, in *Geography*, a town of Asiatic Turkey, in the province of Natolia, 140 miles east of Constantinople, and 74 N.W. of Angora. This town is situated on a small river, which discharges itself into the Black sea. It is the capital of a maritime canton, called by the Turks "Bolivialicti," and in the interior part of its extent very mountainous. N. lat. 40° 45′ E. long. 31° 26′.

BOLIDES, in *Meteorology*. See *Fire*-BALLS.

BOLINA, in *Ancient Geography*, a sea-port town of the Peloponnesus, in Achaia, near Argyra.

BOLINÆUS, a river of the Peloponnesus, which watered the towns of Argyra and Bolina, according to Pausanias. It discharged itself into the small gulf of Panormus.

BOLINAO, in *Geography*, a sea-port town on the island of Luçon, or Manilla.

BOLINBROKE, a town of America, in Talbot county, on the eastern shore of Maryland, 5 miles E. of Oxford. It lies on the N.W. point of Choptank river.

BOLINGÆ, in *Ancient Geography*, a people of India, near the Indus, mentioned by Pliny, Ptolemy, and Steph. Byz.

BOLINGBROKE, in *Geography*, a small town of Lincolnshire, England, is seated in a valley between the river Witham and the sea-coast. Here was formerly a very considerable castle, which was nearly demolished by Oliver Cromwell and his partizans, who also laid other parts of the town, with the church, in ruins. In the times of feudal vassalage, the castle at Bolingbroke was distinguished among the pompous mansions of the nobles. Here the celebrated John of Gaunt, duke of Lancaster, occasionally held his court, and it was the birth-place of his fourth son, who was afterwards crowned king of England. He was the fourth Henry who sat on the English throne, and from the place of his birth was known by the name of Henry of Bolingbroke. The St. John family also derive the title of viscount from this town. The only manufacture of the place is earthenware, and that is very inconsiderable. In the parish are 72 houses, and 283 inhabitants.

BOLINTHOS, in *Natural History*, a name given by Aristotle, and some of the other ancient Greeks, to the *monops* of Ælian, that is, the BONASUS.

BOLI-

BOLIPLEIKA, in *Geography*, a town of Russia, in the government of Saratof, on the west side of the Volga; 124 miles south of Saratof.

BOLISSUS, in *Ancient Geography*, a town of Asia, in Æolia, near Chio, according to Herodotus. Thucydides (l. 8.) mentions a victory gained by the Athenians over the inhabitants of Chio near this town.

BOLKOF, in *Geography*. See BOLCHOF.

BOLKOWITZ, a town of Silesia, 20 miles south of Glogaw.

BOLLANDISTS, in *Literary History*, a denomination given to certain Jesuits of Antwerp, who were a considerable time employed in collecting the lives and acts of the saints.—Thus called from J. Bollandus, one of the first and chief of the association.

BOLLANDUS, JOHN, in *Biography*, a famous ecclesiastical historian, was born at Tillemont in the Low Countries, in 1596, and educated among the Jesuits, by whom he was employed in collecting memorials of the church-saints, under the title of "Acta Sanctorum." The plan of the work was formed by father Rosweide, and it was to be arranged according to the order of celebrating their memories in the calendar. Bollandus, in 1643, published "The Lives of the Saints of the Month of January," in 2 vols. fol.; followed in 1658, by those of February, in 3 vols. fol. He had begun those of March, when he died in 1665. This work was continued by Henschenius, Papebroch, and others, on a scale of such extent, that the commencement of October reaches the 47th volume folio. Nouv. Dict. Hist.

BOLLARDS, large posts set in the ground on each side of a dock. On docking or undocking ships, large blocks are lashed to them; and through these blocks are reeved the transporting hausers to be brought to the capstans.

BOLLEN, in *Geography*, a town of Germany, in the circle of Austria, and duchy of Carinthia, 7 miles east of Mellstat.

BOLLENZ. See BREGNO.

BOLLIN, a river of England, which runs into the Mersey, 4 miles E.N.E. of Warrington.

BOLLITO, in the *Glass Works*, a name by which the Italians called a sea-green colour, or artificial crystal.

To prepare this colour you must have in the furnace a pot filled with forty pounds of good crystal, first carefully skimmed, boiled, and purified, without any manganese; you must then have twelve ounces of the powder of small leaves of copper, thrice calcined, and half an ounce of zaffer in powder; mix them together, and put them at four times into the pot, that they may the better mix with the glass; stirring them well at each time of putting in the powder, lest they should swell too much and run over.

BOLLOS, in the mines of Peru, a denomination given to the ingots or bars of silver procured there from the ore by the operation of the fire, and the use of aqua fortis.

BOLM, in *Geography*. See BULAM.

BOLNEST, EDWARD, in *Biography*, practised medicine in London in the beginning of the 17th century. He published, in 1605, "Chemia Medicina illustrata," or the true grounds and principles of the art of physic, 8vo. London, and the following year a translation of it into Latin "Delineatio fundamenti et princip. art. med.;" also "Aurora chemica seu naturalis methodus preparandi animalia, vegetabilia, et mineralia," 1675, 8vo. An edition of this work was published in English, in 1672. "A rational way of preparing animals, vegetables, and minerals, for physical uses." Haller. Bib. Med.

BOLNKI, in *Geography*, a town of Lithuania, in the province of Wilna, 14 miles E. S. E. of Wilcomirz.

BOLOGNA, or BONONIA, a city of Italy, the capital of the Bolognese duchy, is, next to Rome, the largest, finest, and richest city in the Ecclesiastical State. Its ancient name was *Felsina*, derived from Felsinus, a Tuscan king, who is supposed to have built it 25 years before the foundation of Rome. The name of Bononia is traced by some to a successor of Felsinus, called Bonus; but others deduce it from the Boii. Its [illegible] between five and six Italian miles, and the number of its inhabitants is estimated at 80,000; but the whole district, which includes 308 cities, towns, and villages, is said to contain 308,000 persons. Its figure is oblong, the length of it much exceeding the breadth; and viewed at a distance, it bears some resemblance of a ship, the tower of Asinelli, which is 371 feet high, being the mast. It is surrounded by a solid and lofty brick wall, well built, and adorned with piazzas, which extend through the streets, and under which passengers may walk without being incommoded by the sun or rain. The houses in general have lofty porticoes, which would have a better effect if the streets were not so narrow; but in this particular, magnificence is sacrificed to convenience, for, in Italy, shade is considered as a luxury. This city is seated at the foot of the Apennines, in an extensive, fertile plain, which liberally supplies the inhabitants with its rich produce. The river Savona washes its walls, and the rivulet Reno passes through it, parting into several small streams; and the latter, by means of a canal, communicates with the Po, and affords great advantage to the city.

The public edifices of various kinds are numerous and magnificent. In the centre of the city stands a high tower, called Degli Asinelli, from Gerardo Asinelli, who built it at his own charge in 1109; near it is the leaning tower, called Garisenda, which by a fall of part of it is now reduced to the height of 130 feet, and which inclines, so that a plumb-line let down from the top deviates seven feet from the wall at the bottom. Of the palaces in Bologna, that which is denominated the Public Palace is much the most spacious, though not the most elegant. In this the cardinal legate is lodged; and it has also apartments for the Gonfalonier, as well as halls, or chambers, for some of the courts of justice. This edifice contains some very magnificent apartments, and a few good pictures, of which the most esteemed are, a large one, by Guido, of the Virgin, and the infant Jesus, seated on a rainbow; a Sampson, also by Guido, refreshing himself with the water which issues from the jaw-bone, with which he has just defeated the Philistines; and a St. John the Baptist, by Raphael. The first object which strikes the eye of a stranger on his arrival at this town, is a noble marble fountain in the area before the Palazzo Publico. The principal figure is a statue of Neptune, 11 feet high, with one hand stretched out, and the other holding the trident. The body and limbs are finely proportioned, the anatomy perfect, and the character of the countenance severe and majestic. This figure of Neptune, as well as all the others of boys, dolphins, and syrens, which surround it, are in bronze. The whole is the workmanship of Giovanni di Bologna, and is highly esteemed; and yet there seems to be an impropriety in making water flow from the breasts of the sea-nymphs or syrens. Over the entrance of this palace is a bronze statue of pope Gregory XIII., weighing 11,300 pounds, and executed by Minganti. Near it is another statue of pope Boniface VIII. The interview between the emperor Charles V. and pope Clement VII. in 1529, when that prince submitted to be crowned by the pope, is recorded by an inscription on a copper-plate. In the Sampieri palace

are ſeveral pieces by the three Caraccis; one of the beſt ever done by Albano, repreſenting Cupid kiſſing his mother Venus, and, with an air of triumph, pointing at the rape of Proſerpine by Pluto; and another, more admired than all the reſt, and conſidered by the judges as the maſter-piece of Guido, the ſubject of which is the "Repentance of St. Peter," and conſiſting of two figures, that of the ſaint who weeps, and a young apoſtle who endeavours to comfort him. Although the nobility of Bologna are not now very rich, many of their palaces are furniſhed in a magnificent taſte, and contain paintings, particularly thoſe of the celebrated maſters which this city had the honour of producing, that are their chief ornaments, and are held in high eſtimation. The palaces were built, and ornamented, when the proprietors were richer, and when the fineſt works of architecture, ſculpture, and painting, could be procured on eaſier terms than at preſent. The galleries and apartments are ſpacious and magnificent; and yet there are circumſtances in the moſt ſplendid, that muſt hurt the eyes of thoſe who are accuſtomed to that perfect exactneſs in finiſhing, which prevails in Engliſh houſes. The glaſs of the windows of ſome palaces is divided into little ſquare panes, which are joined together by lead; and the floors of all are ſo indifferently laid, that you often feel a looſe brick ſhaking under your feet, as you walk through the fineſt apartments.

Bologna is alſo embelliſhed with a great number of churches and convents, which are enriched with a variety of paintings, ſculptures, &c. Of the churches, of which there are ſaid to be 200, that of St. Petronius is the largeſt. In this church the emperor Charles V. was crowned in 1530; and on the pavement of it, Caſſini drew his meridian line, conſiſting of pieces of red and white marble inlaid, of a hand's breadth; thoſe in which the ſigns of the zodiac are cut, are a foot ſquare. This line is half the length of the church, which is 360 feet; and at its commencement is a Latin inſcription, expreſſing that "the whole length of this meridian line, diſtinguiſhed by the ſigns, &c. is the ſix hundred thouſandth part of the circumference of the terraqueous globe." On the pavement, at the end of the line, is an inſcription in white marble, denoting "the meridian line from the zenith to the tropic of Capricorn." Oppoſite to the vertical point, is the date MDCLII. A ſmall round aperture has been made in the roof of the church, towards the ſouth, through which the rays of the ſun form a circular luminous ſpot, about eight inches in diameter, on the pavement, which ſhews the proper meridional point on the line every day. The church of the Dominicans is one of the moſt magnificent in Bologna. The chapel, dedicated to the honour of St. Dominico, who is ſaid to have died at Bologna in 1221, is much admired. It conſiſts of a curious dome, in which the glittering of gold appears throughout, adorned with the moſt capital paintings, repreſenting the hiſtory of his life. His monument is of white marble, ornamented with beautiful baſſo-relievos, by Michael Angelo; and the altar, together with the large candleſticks that ſtand upon it, are of ſilver. The pavement and the walls are inlaid with marble of different colours. In the veſtry is depoſited, amidſt jewels and various treaſures, a manuſcript of the Old Teſtament, or at leaſt of the Pentateuch, pretended to have been written by Ezra himſelf. See BIBLE. It is a large folio, carefully preſerved in a glaſs caſe, and was preſented to the convent by the Jews, when they removed hither from Rome, and were allowed to erect a noble ſynagogue about the cloſe of the 14th century. The other principal churches are the Franciſcan, in which are paintings by Facini, Luigi, Caracci, Brizio, Guido, and Tiarini; that of St. Agnes, containing, over the high altar, the martyrdom of the ſaint, by Domenichino; St. Bartholomew, before which ſtands a marble ſtatue of St. Petronius, by Brunelli, and in which are an annunciation, the nativity, and the flight into Egypt, by Albano; the church of the Capuchins, in the veſtry of which is a crucifixion, by Guido; that of S. Giovanni in Monte, famous for an admirable picture of St. Cecilia, by Raphael, which is much extolled by Addiſon, and reckoned one of Raphael's capital pieces, &c. &c. The convents alſo are enriched with valuable paintings and other ornaments, as well as the palaces and churches. A Dominican convent, ſeated on the top of a hill, about three miles from the city, is in poſſeſſion of a portrait of the virgin Mary, ſaid to have been painted by St. Luke. Sigoni ſays, that it was brought from the church of Sancta Sophia at Conſtantinople in 1160; and it is thought to have wrought many miracles in favour of the inhabitants of Bologna. A curious gallery, open to the ſouth and cloſed by a wall to the north, is built all the way from the city to the convent; on the open ſide it is ſupported by a long row of pillars; and was erected by voluntary contribution in honour of the virgin, and for the convenience of pilgrims. This long colonnade is about twelve feet in breadth, from the pillars to the wall, and about ſixteen feet high; all the communities of the town walk, once a year in ſolemn proceſſion, to the convent, and bring the holy picture to viſit the city. It is carried through the principal ſtreets, attended by every inhabitant who can afford to purchaſe a wax taper. During this proceſſion, the bells continue ringing, the cannon are fired, and the troops under arms practiſe the ſame ceremonies when the picture paſſes, as if it were commander in chief of the forces. In the library of the convent, belonging to the church di S. Salvatore, are many curious MSS.; particularly one of the hiſtory of queen Eſther, written on yellow coarſe leather in large Hebrew characters, and done up in a roll or volume, according to the original ſignification of the word. The canons pretend that this was written by Ezra. Here is alſo ſhewn a Hebrew MS. of the O. T. written on vellum, in 3 vols. fol. ſaid to have been written in 953; it has, however, points or vowels. Among other MSS. amounting to about 300 in number, are the N. T. called the "Codex Bononienſis," ſaid to be of the 11th century, containing the whole N. T. except the apocalypſe, abounding with abbreviations; and a Greek verſion of the minor prophets and Daniel, ſuppoſed to be of the 10th century; and among the printed books are Manutius's edition of Cicero's works, 4 vols. fol. publiſhed at Milan in 1498, and a Latin bible in folio, which, by a printed advertiſement annexed to it, appears to have been completed at Mentz by John Fuſt and Peter Schoiffer in 1462.

The univerſity of Bologna is one of the moſt ancient and moſt celebrated ſeats of literature in Europe; it was founded, as ſome ſay, by the emperor Theodoſius in 433, but others, with greater probability, attribute it to Charles the Great. For an account of the academy of ſciences, ſee ACADEMY. Over the gate of the magnificent edifice appropriated to that academy, is the following liberal inſcription:—"Bononienſe Scientiarum atque artium inſtitutum ad publicum totius orbis uſum." Here are an obſervatory, with the neceſſary inſtruments for aſtronomical obſervations; a very valuable library, in three ſpacious rooms, where any perſon may ſtudy and have the uſe of the books four hours every day; alſo, apartments for the ſtudents of ſculpture, painting, architecture, chemiſtry, anatomy, aſtronomy, and every branch of natural philoſophy. They are all ornamented with deſigns, models, inſtruments, and every kind of apparatus requiſite for illuſtrating thoſe ſciences. There are alſo profeſſors who regularly read lectures. There is a hall full of models,

models in architecture and fortification, a valuable collection of medals, and another of natural curiosities, as animals, earths, ores, minerals; and a complete collection, to assist the study of the materia medica, and every part of natural history. There is also a gallery of statues, consisting of a few originals, and very fine casts of the best statues in Italy. Honorary premiums are distributed every year among the artists, for the best designs in painting, sculpture, and architecture.

The anatomical theatre is adorned with statues of celebrated physicians; and the museum belonging to it supplies an abundance of anatomical preparations, and a complete suite of anatomical figures in wax: a man and woman are exhibited in the natural state; the same with the skin and cellular membrane removed, so that the external muscles of the whole body and limbs appear. In the subsequent figures the more external muscles are gradually removed, till nothing but the simple skeleton remains. These figures are very well formed, preserving the natural appearance and situation of the muscles and blood-vessels with as great exactness as could be expected in a work of this nature. There are also models in wax, of particular parts, and of several of the viscera of the human body separately.

The inhabitants of Bologna carry on a very considerable trade in silks and velvets, and leather bottles, which are manufactured here in great perfection. The country produces immense quantities of oil, wine, honey, wax, flax, and hemp; and furnishes all Europe with hams, dried tongues, sausages, macaroni, sweetmeat, olive, perfumes, wash-balls, liqueurs, and essences. The people are industrious, and allowed to enjoy the fruits of their labour; the nuns are very ingenious in making artificial flowers, and imitating fruits of various kinds; and very beautiful works are also made of walnut-tree and rock-crystal. The markets are plentifully supplied with provisions; fruit is had in great variety, and of excellent quality; and the common wine of the country is a light white wine of an agreeable taste, which is preferred by strangers to any of the French or German wines that may be had there. The inhabitants, in general, are facetious and polite to strangers, who may receive at Bologna every kind of accommodation that may suit their taste.

Bologna long retained the name of a republic, sent an ambassador to the pope's court, and the word "Libertas" was inscribed on the arms and coin of the state, with the flattering capitals S. P. Q. R. The civil government and police of the town were allowed to remain in the hands of the magistrates, who were chosen by the senate, which formerly consisted of 40 members; but since this republic came under the protection, as it is called, of the pope, he thought proper to add ten more; but the whole 50 still retain the name of the "Quaranta." One of the senators presided in the senate, and was called the "Gonfalonier," from his carrying the standard (Gonfalone) of the republic. He was the chief magistrate, was attended by guards, and was constantly at the palace, or near it, to be ready on any emergency; but he remained only two months in office, and the senators took it by turns. In the midst of all this appearance of independence, a cardinal legate from Rome governed this republic; he was appointed by the pope, with a vice-legate, and other assistants. The orders which the legate issued, were supposed to be with the approbation of the senate; or at least, they never disputed the office, which was of higher dignity than any other in the gift of the court of Rome, and continued for three years; at the expiration of that time, his holiness either appointed a new legate, or confirmed the old one in the office for three years longer. This ecclesiastical viceroy lived in great magnificence, and had a numerous suite of pages, equerries, and halberdiers, who attended him in the city. When he went into the country, he was accompanied by guards on horseback. The gonfalonier and magistrates regulated all the usual matters which regarded the police; and decided, in common causes, according to the laws and ancient forms of the republic; but in affairs of great importance, and, indeed, as often as he chose to interfere, the cardinal legate without doubt influenced all decisions. This must be mortifying to the senators and noble families; but was less felt by the people in general, who exhibited every appearance of living under a mild and beneficent government. Bologna was the see of an archbishop; who had for his suffragans the bishops of Crema, Borgo, St. Domino, Modena, Parma, Piacenza, and Reggio. Bologna is 23 miles S.W. of Modena, and 145 N. W. of Rome. N. lat. 44° 29′ 36″. E. long. 11° 21′ 15″. Keysler's Travels, vol. iii. p. 247. Moore's View of Society, &c. in Italy, vol. i. p. 252. See BOLOGNESE.

BOLOGNA *bottles*. See UNANNEALED *Bottles*.

BOLOGNA *stone*. See BONONIAN *Stone*, and PHOSPHORUS.

BOLOGNE, in *Geography*, a town of France, in the department of the Upper Marne, and chief place of a canton in the district of Chaumont, 6 miles north of Chaumont.

BOLOGNESE, FRANCISCO, in *Biography*, an eminent painter of landscape and history, whose original name was *Francisco Grimaldi*, was born at Bologna in 1606, and educated in the school of Annibal Caracci. He completed his studies at Rome; and his improvement was such, as to attract the attention of pope Innocent X. by whom he was employed both in the gallery of his palace at Monte Cavallo, and in the Vatican. Among his numerous admirers and friends were the prince Pamfili, the pope's nephew, and many of the principal nobility at Rome; Lewis XIV. and cardinal Mazarin at Paris, who procured for him a large pension; and employed him in decorating the Louvre; and after his return to Italy, the popes Alexander VII. and Clement IX. He was peculiarly happy in his execution of landscape: and was distinguished by his fresh and bold colouring, light and fine touch, and an elegant mode of composition. His landscapes in the manner of Caracci are models of the style of that school, though the colouring of them is thought to be somewhat too green. He understood architecture, and also etched, with great freedom, taste, and spirit, a great number of landscapes, partly from his own designs, and five after Titian. His agreeable manners and amiable disposition attached universal esteem. His benevolence was singularly manifested towards a Sicilian gentleman and his daughter, who had retired to Rome from the troubles of his country. They lodged near him, and were known to be so poor as to want bread. As soon as Bolognese was apprized of their situation, he repeatedly knocked at their door in the morning, threw in some money, and withdrew undiscovered. The Sicilian at length detected him in one of his acts of beneficence, and in token of gratitude fell at his feet. The painter raised and embraced him, and they continued mutual friends through life. Bolognese died at Rome in 1680, and bequeathed considerable property to his six children. His principal works are at Rome, and consist of large landscapes, and historical pieces in fresco. The pictures of his best time are very rare, and afford large prices. His son *Alexander* was a good painter in the style and taste of his father, though much inferior. Among his engravings are the "Brazen Serpent," from a composition of his own, which, though slight, is a spirited, free etching, in the style of a painter. Pilkington and Strutt.

BOLOGNESE, or the *duchy of Bologna*, in *Geography*, a territory

ritory of Italy, in the ecclesiastical state, bounded on the north by the Ferrarese, on the east by Romagna, on the south by Tuscany, and on the west by Modena; anciently inhabited by the Boii and Ligures. It was formerly a republic, under the protection of the emperor of Germany; but, in 1278, it became subject to pope Nicholas III. After many vicissitudes, pope Julius II. in 1513, annexed the city of Bologna, and all its dependencies, to the papal dominions; and in consequence of its voluntary submission to the see of Rome, it was indulged in several privileges, which it continued long to enjoy without molestation. But after the city of Bologna was taken by the French in the campaign of 1796, the legations of Bologna, Ferrara, Modena, and Reggio, entered into a treaty to form a republic, under the name of the "Republica Cispadana," or "Cisalpine Republic;" which was confirmed by the eighth article of the treaty of Campo Formio, October 17, 1797.

The soil of this territory is rich and fertile, and in the vicinity of Bologna it is so much improved by cultivation, that it appears like one continued garden. The vineyards are not divided by hedges, but by rows of elms and mulberry trees; and the vines hang in a very beautiful picturesque manner, in festoons from one tree to another. The country is not only fertile in vines, but likewise in corn, olives, and pasturage, and has, not without reason, acquired the name of "Bologna la Grassa." The Bolognese affirm, that their cheese is not inferior to that of Parma, and they sell a great quantity of it under the name of Parmesan cheese. See Bologna.

BOLOGNETTI, Pompey, in *Biography*, was born at Bologna, in Italy, about the year 1616, where he received his education, and attaching himself to the practice of physic, was admitted doctor, and then professor in medicine, at the university there, in which capacity he was much admired, his lectures being numerously attended. His works are "Consilium de precautione occasione mercium, ab insultibus imminentis contagii," Bono. 1630, folio; which, perhaps, gave birth to Dr. Mead's work on that subject, or suggested the idea of it. "Remora senectutis," 1650, 4to. Haller. Bib. Med. Eloy. Dict. Hist.

BOLOGNINI, Angelus, a celebrated professor of medicine and surgery, who flourished in the beginning of the 16th century, was born in the neighbourhood of Padua, but practised and taught medicine at Bologna. At the earnest intreaty of his pupils, he says, he published, in 1508, "De cura ulcerum interiorum, et de unguentis communibus in solutione continui," 4to. which has been frequently re-printed. He was of the school of Avicenna, on whose works he commented in his lectures. He gives forms for preparing ointments with mercury, which he highly extols, and says, they cure the lues, though the salivary glands should not be affected, which, however, he admits to be desirable. The latter part of his life was spent in retirement at Padua. Astruc. de Morb. Gal. Hall. Bib. Med.

BOLOTOVA, in *Geography*, a town of Siberia, 24 miles N.E. of Nertschink.

BOLSCHAIA, a town of Siberia, on the Irtish, 240 miles E.S.E. of Tobolsk.

BOLSCHAKINA, a town of Siberia, 68 miles south of Orlenga.

BOLSEC, Jerom, in *Biography*, a carmelite of Paris in the 16th century, who deserted his order on account of some free opinions, and became a refugee at Ferrara. There he commenced the profession of physic, and being acquainted with Calvin, removed to Geneva. In this city he divulged some opinions concerning predestination, which excited the resentment of the Genevan reformer, and which induced the magistrates of Geneva, probably at his instigation, first to imprison him, and finally to banish him, as one convicted of sedition and Pelagianism. He was afterwards expelled from the canton of Bern, whither he had retired; and failing in his endeavours to ingratiate himself with the Protestants of Paris and Orleans, he returned to the bosom of the Catholic church. He then revenged himself by writing a very slanderous account of the life of Calvin in 1577, and another of that of Beza in 1582, the falsities of which sober Catholics are ashamed to quote. He also wrote against Calvin's institution, and his arguments were afterwards made use of by Cardinal de Richelieu. Bolsec practised physic at Autun, and at Lyons, in which latter city he died, a few years after he had written Beza's life. Gen. Dict.

BOLSENA, in *Geography*, a town of Italy, in the ecclesiastical state, and patrimony of St. Peter, delightfully situated on a lake that is of the same name, which is about 35 Italian miles in circumference. In this lake are two islands, namely, Bisentina and Martana, with a church in each island; in the former the unfortunate Amalasunta, daughter of Theodoric, king of the Ostrogoths, is said to have been put to death in 534, by order of the ungrateful Theodatus, her cousin, whom she had admitted to a share in the government. We learn from Pliny, (Hist. Nat. l. ii. c. 95,) that in his time these two islands were floating. He calls this lake Tarquinian, a name which it derived from Tarquinium, one of the principal 12 Etrurian cities, whose territories anciently extended to this lake; but it has been doubted, whether Pliny refers to the islands of this lake. Bolsena is environed with mountains, covered with trees, forming a kind of august amphitheatre. On an eminence near it may be seen the ruins of the ancient "Volsinium." It is 7 miles S. of Orvieto.

BOLSOVER, a considerable market town of Derbyshire, England, has been noted for its manufactories of buckles, spurs, bridle-bits, stirrup-irons, and other similar articles; but the greater part of them is now made in Birmingham, and its vicinity. The town is governed by a constable, and two head boroughs; and a copy-hold court is held here every three weeks. Here was formerly a castle, which, according to the Doomsday book, was possessed, at the Norman conquest of England, by William Peverel. It was of considerable extent, and from its remaining fortifications was evidently of great strength. Its fortress is mentioned by Leland, as being in ruins when he visited this part of England, in the time of Henry the Eighth. A modern mansion, still called the castle, occupies the site of the ancient buildings, and was erected by sir Charles Cavendish in 1613. It is of square shape, and assumes the castellated character by towers at the four corners, and an embattled parapet. In this mansion, a superb entertainment was given by William Duke of Newcastle, to Charles the First and his queen in the year 1633. Upon this occasion, all the neighbouring gentry were invited to partake of the festival, which was conducted upon so magnificent a scale, that the expences were estimated as amounting to 15,000l. Grand pageants, &c. were represented before the royal guests, and the fancy and taste of Ben Jonson were employed in preparing speeches and scenery upon the occasion. It now belongs to the duke of Portland, whose family obtained it by marriage with a daughter of the earl of Oxford. In the parish church is a magnificent monument to the memory of the above-named sir Charles Cavendish, many of whose family are also interred here. Bolsover has a weekly market on Fridays, one annual fair, and a statute fair for hiring servants, &c. It is 8 miles from Mansfield, and 145 N.W. from London. In the parish are 435 houses, and 1091 inhabitants.

At *Elmton*, a ſmall village three miles N. E. of Bolſover, was born *Jedediah Buxton*, a man who, though only a poor labourer, acquired extraordinary celebrity, for his retentive memory, and recondite powers of calculation.

Three miles north of Bolſover are the great coal works, called Norbrig's Colliery. Theſe belong to the Duke of Portland, and are let out to a company of perſons who ſend great quantities by the canal to Workſop, Redford, Stockwith, &c. Bibliotheca Topographica, No. 32.

BOLSTER, among *Surgeons*, a ſoft yielding ſubſtance either laid under the head or a broken limb.

Bolster is alſo uſed for a ſtuffing, intending to fill out or raiſe a flat, ſinking, or hollow part. In which ſenſe bolſters are contrived for crooked, bunched, and other diſtorted backs, ſhoulders, &c.

Bolsters *of a ſaddle*, in the *Manege*, thoſe parts which are raiſed on the bows, both before and behind, to reſt the rider's thighs, and keep him in a poſture of withſtanding the diſorders which the horſe may occaſion. Common ſaddles have no bolſters behind or even before.

Bolsters, in *Sea Language*, ſmall cuſhions or bags, filled with tarred canvas or rope yarn, &c. and placed under the ſhrouds and ſtays, to prevent their chafing againſt the treſtle-trees, by the motion of the maſt, when the ſhip rocks at ſea.

Bolsters are alſo pieces of fir fayed upon the upper ſide of the treſtle-trees, and againſt the thwart-ſhip ſides of the maſt-head. They muſt be ſufficiently long to clear the fid-hole and after croſs-tree, and broad enough to project one inch and a half, or more, without the treſtle-trees, and the ſame in depth, and rounded from the upper to the lower edge on the outſide, and nailed to the treſtle-trees at each end. Their uſe is to prevent the ſhrouds chafing by the motion of the maſts.

Bolsters of an anchor are cylindrical pieces of iron, with a hole through the middle, uſed when holes are to be punched, or opened with pins.

BOLSWAERT, Bolswerd, or Bolswert, in *Geography*, a town of Frieſland, in the United Netherlands, ſaid to have been built in 713 by Bolſwine, ſon of Radbode, king of Frieſland, from whom it took its name. It was almoſt burnt down in 1475, and again in 1515, when it was rebuilt and encompaſſed with a rampart of earth. About a league from this town is a port, which, though much obſtructed by ſand, is very uſeful to the inhabitants. Bolſwaert is about two miles in circumference, and was formerly one of the Hanſe towns; and a great part of the Frieſland baize, which formed a conſiderable article of exportation, was wove in this place. It is diſtant 13 miles S. W. of Leewarden, and 7 S. S. E. of Harlingen. N. lat. 53° 2′. E. long. 5° 24′.

BOLSWERT, or Bolsuerd, Boetius Adam A, in *Biography*, an engraver and printſeller of Antwerp, derived his name from Bolſwaert in Frieſland, where his family reſided, and flouriſhed about the year 1620. He worked only with the graver, and ſucceſsfully imitated the free, open ſtyle of the Bloemarts, in whoſe ſchool he probably perfected himſelf in his art. When he worked from Rubens, he altered that ſtile, and his plates are neater, fuller of colour, and more highly finiſhed. His plates from Bloemart are a ſet of "Twenty landſcapes," "The foreſt of the hermits and hermiteſſes of Egypt and Paleſtine," and "The Nativity of Chriſt:" and thoſe from Rubens, in a more finiſhed ſtile, are the "Reſurrection of Lazarus," and its companion "The Laſt Supper," which is a very beautiful engraving. Strutt.

Bolswert, or Bolsuerd, Scheltius A, brother of the preceding, flouriſhed about 1626, and worked entirely with the graver. His general character, as an artiſt, is thus deſcribed by Baſan: "We have a large number of prints, which are held in great eſteem, by this artiſt, from various maſters, but eſpecially from Rubens, whoſe pictures he has copied with all poſſible knowledge, taſte, and great effect. The freedom with which this excellent artiſt handled the graver, the pictureſque roughneſs of etching, which he could imitate without any other aſſiſting inſtrument, and the ability he poſſeſſed of diſtinguiſhing the different maſſes of colours, have always been admired by the connoiſſeurs, and give him a place in the number of thoſe celebrated engravers, who are deſirous of rendering their works as uſeful as they are agreeable, and of acquiring a reputation, as laſting as it is juſtly merited." His prints are the exact tranſcripts of the pictures from which he engraved them; and his laſt works, though not equally neat or finiſhed, are always beautiful and indicate the hand of a maſter. His boldeſt engravings are from Rubens; and his neateſt from Vandyck and Jordans. Some of this maſter's works have been carefully copied, ſo as eaſily to deceive the unſkilful. Amongſt the eſtimable engravings of this artiſt the following are mentioned: viz. the "Brazen Serpent," from Rubens, "Abraham offering his ſon Iſaac," from Theodore Rombout, the "Education of the Virgin, by St. Anne," the "Marriage of the Virgin," the "Nativity of Chriſt," the "Adoration of the Wiſe Men," the Feaſt of Herod," in which the daughter of Herodias is exhibited, preſenting the head of John the Baptiſt to her mother, and the "Miraculous Draught of Fiſhes," all from Rubens; "Chriſt crowned with thorns," from Vandyck; and a "Crucifixion," from the ſame, in which a figure appears preſenting the ſponge to Chriſt; St. John and the Virgin are ſeen ſtanding at the foot of the croſs, and Mary Magdalene reclining towards it. This is one of his moſt beautiful engravings. The firſt impreſſions, in which the left hand of St. John is not ſeen, are very ſcarce; in the ſecond, the hand appears upon the ſhoulder of the Virgin; but in ſubſequent impreſſions, the hand was again eraſed. Strutt.

BOLT, in *Building*, an iron faſtening for a door, moved with the hand, and catching in a ſtaple or notch made to receive it. Bolts are chiefly of three kinds: *plate*, *round*, and *ſpring-bolts*.

Bolt *of a lock* is the piece of iron which, entering the ſtaple, faſtens the door; being the part which is moved backwards and forwards by turning the key.

Of theſe there are two ſorts; one ſhuts of itſelf by only putting to the door, and is called a *ſpring-bolt*; the other, which only moves when the key opens or ſhuts it, is called a *dormant-bolt*.

Bolt is alſo uſed for a large iron pin, having a round head at one end, and at the other a key-hole or ſlit, wherein to put a pin or faſtening, ſerving to make faſt the bar of a door, window-ſhutter, or the like.

This is more particularly called a *round-bolt*, or *window bolt*.

Bolts, in the *Artillery*, are of ſeveral ſorts; thoſe which go betwixt the cheeks of a carriage to ſtrengthen the tranſoms are called *tranſom-bolts*. The large iron bolts or knobs on the cheeks of a carriage, keep the handſpike from ſliding, when it is poiſing up the breech of the piece. The two ſhort bolts that being put one in each end of an Engliſh mortar-carriage, ſerve to traverſe her, are called *traverſe-bolts*. The bolts that go through the cheeks of a mortar, and, by the help of quoins, keep her fixed at the elevation given her, are called *bracket-bolts*. And the four bolts that faſten the bracket or cheeks of a mortar to the bed, are called

called *bed-bolts*. Besides these there are bolster, eye, breeching, garnish, joint, stool-bed, and axletree bolts. See CARRIAGE.

BOLTS, in *Carpentry*, denote pieces of wood cleft with wedges, in order to be split into laths.

BOLTS, or iron pins, in a *Ship*, are of several sorts, of which the most common have small round heads, and are used to unite two or more pieces together. Some have round flat heads, called saucer-heads, with a mortise in the other end, or point, and are used to fasten moveable pieces to those that are fixed; others have an eye at one end, for lashing or hooking blocks, &c. and are driven in mast-heads, yards, caps, &c. Some have a square part left at the back of the eye, that they may not be driven on the eye, and endanger splitting. Bolts are frequently distinguished according to the places where they are used; as, *chain-bolts*, *bolts for carriages*, &c.; *ring-bolts*, serving for the bringing-to of the planks, &c. *drive-bolts*, used to drive out others; *set-bolts*, employed for forcing the planks, and other works, and bringing them close to one another; *rag-bolts*, on each side full of jags or barbs, to keep them from flying out of their holes; *clench-bolts*, those which are clenched or fastened at the ends where they come through; *fore-lock-bolts*, made like locks with an eye at each end, whereunto a fore-lock of iron is driven to prevent starting out: *fend*, *or fender-bolts*, made with long and thick heads, struck into the outermost bends or wales of a ship, to save her sides from bruises and hurts. The following machine for drawing bolts in and out of ships was invented by Captain Bolton of the Navy, and obtained from the Society of Arts their prize of the gold medal. A model of it is preserved in the repository of the society for the use of the public. The description of it (See Transactions of the Society, vol. xvi.) is as follows:

AAAAAA (*Plate of ships*) is the frame of the machine. B, a cylindrical tube, having a female screw in the inside. C, a wheel with teeth attached to the cylinder B. D, an endless screw adapted to the wheel C. E, handle of the winch. F, the bolt drawing out. G G, blocks to support the frame. H, a hollow piece of steel, having on its outside a male screw, whose threads work within the female screw in the cylinder B. To this piece of steel the bolt is to be rivetted. I, a semicircular piece of steel, which is to be introduced into the notches on H, when a similar notch has been cut in the head of the copper bolt, which by this means is prevented from turning in H, while drawing. K, the bolt, as prepared to receive the machine. L, a steel bar, somewhat smaller than the bolt to be drawn, having at one end a male screw, A, and at the other end another male screw that fits into the famale screw in B. M, a section of a male screw, having a square hole larger than the bolt. N, a bolt with a male screw at one end ready to be drawn in.

The machine, of which a plate is annexed, consists of a frame supporting a cylindrical female screw tube. On this tube is mounted a wheel with teeth adapted to an endless screw fitted to the frame, and worked by a handle.

To draw the bolt out.

The head of the bolt must be cut off, and a hole made in the timber big enough to receive the male screw H, which is put over the bolt: a slit is then to be made, either by a saw or cold chissel, in the head of the bolt, to receive the key I, and which corresponds to the slit in H; the bolt head is then to be rivetted as firmly as possible upon H; the cylindrical tube, B, is then to be screwed on, turning the whole machine round till it can be done no longer, when the endless screw is to be used. If the machine is of a proper strength, and the rivetting well done, the power is such as to extract the bolt or break it, but generally it will be drawn out uninjured. See DRAWING, &c.

To draw bolts into ships.

It will be necessary to have a bar, L, which is recommended to be made of steel, long enough to pass from the inside to the outside of the ship, and somewhat smaller than the copper bolt intended to be drawn in. This may be called a conductor. On one end should be a male screw, *a*; the bolt to be drawn in should be tapped at one end to receive the male screw, *a*, on the conductor, and at the other end should be another male screw that fits into the female screw in B; after which the operation is the same as drawing a bolt out, and the machine should be applied accordingly. When the bolt arrives at its destined place, it may be secured on the inside by a nut, which is as good a way of fastening as clinching, and much more expeditious.

This machine though only of the height of eighteen inches, will draw bolts in or out of any length; for, after the bolt has risen to the top of the tube, it will only be necessary to screw the machine back, and follow up the work with blocks of timber, as represented in the drawing.

Note. If the upper part of the hole in H be made square, larger than the round hole as shewn at M, and the head of the bolt rivetted into it, it will do away the necessity of the key, I, render the machine less complicated, and save much time and trouble.

BOLTS of *an Anchor*, are cylindrical iron pins for fastening the two parts of the stock together.

BOLTS for *whirls*, in *Rope-making*, are large iron pins with round heads, driven in the board over the crank-wheel for the whirls to run on.

BOLT is also used for a measure or certain quantity of canvas, amounting to twenty-eight ells.

BOLT of silk or stuff denotes a long narrow piece, of indefinite measure.

BOLT, *pease*, in Essex, denotes the pease-straw, when the grain is threshed out of it.

BOLT, *thunder*. See THUNDER-*bolt*.

BOLT-*rope*, in *Sea Language*, is a rope sewed to the edges of a sail, to prevent it from rending by the force of the wind, or any other cause.

A bolt rope should be made of fine yarn spun from the best hemp, and sewed neatly on with good twine. To avoid stretching, the rope must be kept well twisted while sewing on, and care taken that neither too much nor too little slack is taken in: that part of the rope at the leech of the sail is to be cross stitched at every foot in length, at every seam, and in the middle of every cloth at the foot, with three cross stitches: four cross stitches should be taken at all the beginnings and fastenings off; the first stitch given twice, and the last three times. Small sails have two cross stitches at every seam, and three at every fastening off.

BOLTED *flour*, that which has passed through the BOLTERS.

BOLTEL, in *Building*, any prominence or jutting out, as of a piece of timber, end of a beam, or the like, advancing beyond the naked of the wall.

BOLTERS, or BOULTERS, a kind of sieves for meal, having the buttons made of woollen, hair, or even wire. The word seems derived from the German, *beutal*, *a sieve*; whence also *beutelen*, *to bolt*. The bakers use bolters, which are worked by the hand; millers have a large sort, wrought by the motion of the mill.

BOLT-HEAD, a vessel used by the chemists, the same as matrass; which see.

BOLT-HEAD, in *Geography*, a promontory of England, on the

the ſouth-coaſt of the county of Devon, 19 miles S.E. of Plymouth. N. lat. 50° 9′. W. long. 30° 47′. The promontory 4½ miles W.N.W. of this is called *bolt-tail*.

BOLT and TUN, in *Heraldry*, is a bird bolt in pale piercing through a ton.

BOLTING, or BOULTING, the act of ſeparating the flour from the bran, by means of a ſieve or bolter.

BOLTING-*cloth*, or BOLTER-*cloth*, ſometimes alſo called *bulting cloth*, denotes a linen or hair-cloth for ſifting of meal or flour.

That kind of bolting-cloth which is uſed for ſifting of meal, and alſo for a variety of needle work, for young ladies' ſamplers, and for filling up the frames of window-ſcreens, &c. is wove after the manner of gauze of fine ſpun woollen-yarn. The wool neceſſary for making this cloth muſt be long, well-waſhed, and ſpun to a fine equal thread, which, before it is ſcowered, muſt be ſcalded in hot water, to prevent it from ſhrinking. The web muſt be ſtiffened; and in the manufacture of it the Engliſh have the advantage of the Germans, whoſe cloth of this kind is much cheaper, but much inferior in value to that of England. The bolting-cloth of this country is ſtiffer, as well as ſmoother, and the flour paſſes through it much better than through that of the Germans, which is either very little or not at all ſtiffened. A manufactory of this cloth was eſtabliſhed at Oſtra, near Dreſden, by one Daniel Kraft, about the end of the 17th century; and at Hartau near Zittau, it was introduced by one Pleſsky, who learned the art of making it in Hungary. The cloth which is ſent from hence for ſale, not only every where round the country, but alſo to Bohemia, Moravia, and Sileſia, is wove in pieces, containing each from 64 to 65 Leipſick ells; the narroweſt being 10, and the wideſt 14 inches in breadth. Large quantities of it are alſo made by a company in the duchy of Wurtemberg. Bolting-cloth is alſo made at Gera, as well as at Potſdam and Berlin; at the latter of which places there is a manufactory of it carried on by the Jews.

BOLTING-*mill*, a verſatile engine for ſifting with more eaſe and expedition. The cloth round this is called the bolter.

The method of applying a ſieve in the form of an extended bag to the works of the mill, that the meal might fall into it as it came from the ſtones, and of cauſing it to be turned and ſhaken by the machinery, was firſt made known in the beginning of the 16th century, as we are expreſsly told in ſeveral ancient chronicles.

BOLTING, or BOULTING, among *Sportſmen*, ſignifies rouſing or diſlodging a fox, rabbit, or badger, from its reſting place.

BOLTING, in *Law*, a method of pleading, or arguing, formerly in uſe in the inns of court; inferior to mooting. The caſe is argued firſt by three ſtudents, then by two barriſters; an ancient, and two barriſters ſitting as judges.

The word comes from the Saxon *bolt*, a *houſe*; becauſe done privately within doors, for inſtruction.

BOLTON, EDMUND, in *Biography*, an Engliſh antiquarian writer of the 17th century. By religious profeſſion he was a Roman Catholic, and probably enjoyed ſome office under Villiers duke of Buckingham. He was diligent in his reſearches into ſubjects of hiſtory and antiquities, and was the author of ſeveral works, of which the principal are the following; viz. "A Life of Henry II.;" "Elements of Armories," Lond. 4to, 1610; "A tranſlation of Florus," "Nero Cæſar, or Monarchy depraved," Lond. fol. 1624, in which he attempts to eſtabliſh the improbable opinion, that Stonehenge was a monument to the memory of queen Boadicea. His "Vindiciæ Britannicæ," left in MS., was deſigned to prove the great antiquity and early importance of London. From all his performances, Bolton appears to have poſſeſſed the credulity, nationality, and love of trifles, often attendant on antiquarian ſtudies, when they are not directed by taſte and judgment. The time of his death is not known. Biog. Brit.

BOLTON, in *Geography*, a village of Yorkſhire, in England, had a very conſiderable monaſtery of canons regular, of the order of St. Auſtin, founded in 1120 by Robert de Romeli, and this had afterwards other benefactors, and at the diſſolution its annual revenues were valued at 212 *l.* Part of the religious houſe ſtill remains, and one room is appropriated to a free ſchool, which was founded by Robert Boyle, eſq. This village is rendered remarkable from being the birth-place and reſidence of Henry Jenkins, who was born in the year 1500, and lived to the great age of 169 years. He enjoyed a conſtant ſtate of good health, and poſſeſſed his faculties to the laſt year of his life. See LONGEVITY.

BOLTON-*le-Moors*, is an ancient manufacturing town of conſiderable conſequence in Lancaſhire, in England. It may be conſidered as the original ſeat of the cotton trade in this country, and for the manufacture of ornamental and fancy good is ſtill particularly celebrated. Leland, in his Itinerary, notices the cottons (then a ſpecies of woollen) and coarſe yarns which were brought to this town in his time, and obſerves, that many villages in the vicinity were engaged in this manufacture. Coal-pits were alſo worked at that time, and coals are ſtill obtained in abundance from pits in the neighbourhood. The making of fuſtians was introduced into this town, at a very early period, and ſtill continues a prominent object of trade. During the civil wars in the reign of Charles I., Bolton was beſieged by prince Rupert in 1644, and many of the inhabitants were killed. The town is well built, and has rapidly increaſed in ſize and population. It is ſeated in a flat diſtrict, as its name partly implies. The advantage of canal conveyance to Mancheſter and Bury, has proved highly important to the town, whoſe manufactories are thereby greatly promoted. Bolton has a free ſchool, of which Ainſworth, the author of the Latin dictionary, was once a maſter. The proſperity of Bolton may be partly eſtimated from the following comparative ſtate of its population. In the year 1773, there were 5339 inhabitants in this town and Little Bolton. Theſe were augmented to 11,739 perſons in 1789; and in 1801, when the population of the country was eſtimated by order of the houſe of Commons, there were found to be 3476 houſes, and 17,413 inhabitants in the townſhip and chapelry of Great and Little Bolton. The principal mart for the ſale of goods made at this place is Mancheſter, where the manufacturers reſort on Tueſdays, Thurſdays, and Saturdays. "The neighbourhood of Bolton," obſerves the judicious Dr. Aikin, "has been diſtinguiſhed for producing men of great talents in mechanical invention, who have generally been wholly uneducated, and indebted only to native powers, and the habit of obſervation. The moſt celebrated of theſe was ſir Richard Arkwright, of whom falſe pride and prejudice alone can think it derogatory to ſay, that he paſſed a great part of his life in the humble ſtation of a barber in the town of Bolton. His mind was ſo ardently engaged in the improvement of the mechaniſm uſed in the manufactures, that he could ſcarcely keep above want by the exerciſe of his proper profeſſion; but his perſeverance and ingenuity were at length rewarded with a meaſure of opulence, which nothing but the tide of proſperity in a commercial nation could beſtow." See ARKWRIGHT.

At *Smithels*, an old hall, or manſion, north of Bolton, formerly belonging to the Fauconberg family, is a curious old

old wainscotted room, the pannels of which are adorned with upwards of 50 heads, cut in wood. This hall is shewn and visited as a curiosity, from a superstitious prevalent opinion that an impression of a foot may be seen in the stone floor made by one Marsh a martyr, in the reign of queen Mary.

Rivington, in the parish of Bolton, is a conspicuous hill, crowned with a building called Rivington-pike. Some veins of lead and calamine have been worked in this neighbourhood, but have not hitherto proved very fortunate to the adventurers.

Bolton is 11 miles from Manchester, and 197 miles N.W. of London. It has a market on Mondays, and two fairs annually. Aikin's Description of the Country round Manchester, 4to. 1795.

Bolton, a township of America, in Chittenden county, Vermont, seated on Onion river, about 104 miles N.N.E. from Bennington, containing 88 inhabitants.—Also, a township in Tolland county, Connecticut, incorporated in 1720, and settled from Weathersfield, Hartford, and Windsor, 14 miles E. from Hartford.—Also, a township in Worcester county, Massachusetts, 18 miles N. E. from Worcester, and 34 W. from Boston; containing 945 inhabitants, and a good bed of limestone.—Also a township in Washington county, New York, between Scroon lake and lake George, distant 10 or 12 miles S.E. of Ticonderoga, and containing 959 inhabitants.

BOLTONIA, in *Botany*, (named by L'Heretier, in honour of James Bolton, late of Halifax, in Yorkshire, a self-taught naturalist and artist in a humble sphere of life, author of the "History of British Singing Birds," 2 vols. 4to. of "British Ferns," 4to. and of "Funguses growing about Halifax," 4 vols. 4to. with figures of the species, all drawn, etched, and coloured by himself.) L'Heret. Sert. Angl. p. 35, 36. Schreb. 1309. Jussieu 450. Bosc. Nov. Dict. Class, *Syngenesia Polygamia Superflua*. Nat. Ord. *Compositæ radiatæ.—Corymbiferæ*. Juss.

Gen. Char. *Cal.* common; imbricate, with nearly equal linear, acute scales. *Cor.* compound, radiate; florets of the disk tubular, funnel-shaped, five-cleft, numerous; of the ray many, linear, entire, pistiliferous. (Schreb.) three-toothed. (Bosc.) *Pist.* germ oblong; style filiform; stigmas two, those of the ray revolute. *Pericarp.* none; calyx unchanged. *Seed* solitary, compressed, slightly toothed, two-horned; receptacle naked, honey-combed, hemispheric.

Ess. Char. *Cal.* common, imbricate, with linear scales. *Cor.* radiate. *Germs* compressed, vertical. *Seed* obscurely toothed, two-horned. *Recept.* honey-combed.

Species, 1. B. *asteroides*, (matricaria ast. Linn. Mant. 116.) "Leaves quite entire." Stem upright, two feet high, even, scarcely angular, slightly streaked; leaves alternate, remote, sessile, lanceolate, even, bent down at the base, ragged about the edge; panicle thin, stiffish, with one-flowered peduncles; disk yellow; ray pale flesh-colour. 2. B. *glastifolia*. "Lower leaves serrate." Five or six feet high. Both species are natives of South America, flower late in the autumn, and were cultivated by Mr. Miller in 1758.

BOLTSACKEN, or Boltsack, in *Geography*, rocks at the N. entrance of the Great Belt, 5 miles S. E. from the island of Samsoe. N. lat. 55° 48′. E. long. 10°. 40′.

BOLTY, in *Ichthyology*, a fish of the Labrus genus. (*Labrus niloticus* of Linnæus), that is found in the Nile. It is figured and described by Sonnini, in his "Voyage en Egypte." This, it is observed, is one among the small number of fishes that inhabit the river Nile, the flesh of which is delicate, and of a good flavour. Daubenton, in the French Encyclopædia, calls the species *Nébuleux*, on account of the obscure spots with which the fins are marked.

BOLTZNITZ, in *Geography*, a river of Germany, which runs into the Elster near Elsterwerda, in the margraviate of Meissen.

BOLU, a mountain of Asia, in Armenia, 144 miles S.E. of Erivan.

BOLUADIN, a town of Asiatic Turkey, in the province of Natolia, 28 miles N. of Kara-hissar.

BOLUC-*bassi*, in the *Turkish Affairs*, denotes the chief of a company; or a captain who has the command of an hundred janizaries.

BOLURUS, in *Ancient Geography*, a town of Greece, in Thesprotia.—Also a town of Illyria, which belonged to the Trallians. Steph. Byz.

BOLUS, in *Pharmacy*, is a very useful form of extemporaneous prescription adapted to a variety of cases in which a more solid or a more liquid form would not answer the purpose. The consistence of a bolus is the same as that of an electuary, that is, about as soft as dough, so as easily to slip down the throat without falling to pieces. As it must in some degree be tasted while swallowed, it generally consists of the medicine in powder, worked up to the proper tenacity by means of some grateful syrup, soft extract of liquorice, or a palatable conserve; or, if the medicine be an oil, balsam, or other liquid, dry sugar, with flour, almond-paste, and the like, are added to bring it to the due consistence. It is intended to be only a single dose.

The substances most proper to be exhibited in this form are those that are very heavy, and scarcely to be suspended in any liquid so as to be drank off, such as calomel, tin-powder, steel filings, æthiops mineral, or those that are too bulky to be made into a convenient number of pills, and are nauseated by the patient in a liquid form, such as cinchona, chamomile, burnt-sponge, Dover's powder, valerian root; or some of the stronger acrids and aromatics, as guiacum, camphor, musk, castor, ammonia: or those that are little soluble in the stomach, unless previously mixed with some easily soluble matter, and yet do not readily combine with liquid sufficient to be drank off, as oil of turpentine, the balsams and the like, mixed with sugar and flour. Bolusses differ from troches in this, that the latter are made firmer, though equally soluble, and being intended for slow solution in the mouth; they consist only of insipid, or not unpalatable ingredients. Substances that readily become very moist, such as the kali preparatum, should not be used in this form, unless the bolus is intended to be taken immediately: but on this head less caution is required than in compounding electuaries.

This form of medicine should be avoided where the patient is in a state in which the power of swallowing is with difficulty exercised, as in apoplexy, and other comatose disorders; in some spasmodic and painful affections of the throat; or where the œsophagus is naturally very narrow. Alarming accidents have sometimes arisen from a neglect of these precautions. It is likewise difficult to get very young children to swallow them, unless made extremely thin. These minutiæ will not appear trifling to those who are in the habit of personally witnessing the trouble and difficulty which daily attend the exhibition of medicines, and are so liable to defeat the most judicious plans of the prescriber.

In hospitals and dispensaries this form is very commonly adopted, as it is prepared with little trouble, and is economical in the more expensive drugs, no more of them being employed than the immediate wants of the patient require.

Bolus-*Head*, in *Geography*, a cape of Ireland, on the south-west coast of the county of Kerry, 38 miles S. W. of Killarney. N. lat. 51° 44′. W. long. 10° 12′.

BOLWICK,

BOLWYCK, a town of Norway, 40 miles W. of Tonsberg.

BOLZANI, Urbano Valeriano, in *Biography*, one of the revivers of literature in the 15th century, was born at Belluno about the year 1440. Having entered, when young, into the order of the Minorites, he travelled through Egypt, Palestine, Syria, Arabia, Greece, and Thrace, observing whatever was curious either in nature or art. In the course of his perambulations, he twice ascended the summit of Ætna, and surveyed its crater. As a strict observer of his vows, he declined accepting the honours and dignities which were offered him. His fixed abode was at Venice, where he taught the Greek language, and, among other scholars, instructed the learned Gean-Antonio Flaminio, and John d'Medici, afterwards pope Leo X. He was the first who facilitated the attainment of the Greek, by composing a grammar in that language; of which the first edition was printed in 1497, and a second, much enlarged, in 1512. He died in 1524.

BOLZANO, or Bolzen, in *Geography*, a town of Germany, in the Tyrol, seated on the river Eysac, near its confluence with the Adige, famous for its four annual fairs, each of which continues a fortnight, which are much resorted to by Italian and German merchants; 6 leagues S. W. of Brixen, and 9 N. of Trent. It was taken by the French in March, 1797. N. lat. 46° 28′. E. long. 11° 14′.

Bolzano, a town of Italy, in the Vicentin, belonging to the state of Venice, 2 leagues E. of Vicenza.

BOM, in *Zoology*, the name of an American serpent of the Boa genus, called likewise bome, and boma. It is said to grow to a vast size, and to be perfectly harmless; but the latter assertion is improbable; it is not certainly of the poisonous race of serpents. This is called the bom, because it emits a remarkable noise resembling the sound of that word, when pronounced with a deep hollow voice.

BOMAL, or Bohemal, in *Geography*, a town of Germany, in the duchy of Luxemburg, seated on the Ourte, 7 miles S. W. of Spa, and 53 N. W. of Luxemburg.

BOMANGOY, a town of Africa, in the kingdom of Angoy, or Goy (which see), situate on the north bank of the river Zaire. S. lat. 5° 36′. W. long. 13°.

BOMARZO, a town of Italy, in the ecclesiastical state, and patrimony of St. Peter, once episcopal; 14 miles from Civita Castellana.

BOMB, in the *Military Art*, a hollow iron ball, or shell, furnished with a vent, by which it is filled with gun-powder, and which is fitted with a fusee, or hollow plug, by which it gives fire, when thrown out of a mortar.

In the English artillery, bombs are now commonly called shells.

The word bomb comes from the Latin *bombus*, *crepitus*, or *sibilus ani*: by reason of the noise it makes.

The method of preparing a bomb is as follows: a hollow iron globe A B (*Plate Gunnery*), is cast pretty thick, having a round aperture A, by which it may be filled and lighted; and circular *ansæ* C, D, of hammered iron fixed in the mould when they are cast, for the commodious putting it into the mortar, as well as for carrying it from one place to another. In France, the handles are cast iron: but they are thus rendered more clumsy, and liable to break sooner than the others.

It has been usual to make the lower part of the bomb the thickest, that it may fall on that side, and never on the fusee, and that it may also better resist the shock, or impression of the powder by which it is discharged from the mortar; but Mr. Muller thinks that neither of these considerations is of any great importance, and recommends rather to make them every where equally thick, because they would thus burst into a greater number of pieces. Artillery, p. 151. in his System, &c. vol. v.

After the shells have been gauged and examined as to their dimensions and weight, they must be well searched within and without by means of a copper grater, to ascertain whether there be any holes or cavities in them; and the iron pin or spike at the bottom of the inside, which supports the core when they are cast, should be beat down or broken off. They are then to be hammered all over, to knock off the scales, and discover flaws; and no hole, in the large shells, is allowed, of more than $\frac{3}{4}$ of an inch deep. An empty fusee is then driven into the fusee hole; and the shell is suspended in a tub of water, so that the water may cover it, without running into the fusee; in this situation the nose of a pair of bellows is introduced into the fusee hole, and several strong puffs given with the bellows; and if no bubbles rise in the water, it is concluded that there are no holes in the shell, but that it is found and fit for service.

When the shell has been thus proved, and is found to be dry within, gun-powder is introduced into its cavity, by means of a funnel; but it is not quite filled. Artillerists, though they agree that shells should not be quite full, have not ascertained the precise quantity which would serve for their bursting into the greatest number of pieces. Captain Desaguilliers, after having made several experiments, apprehends, that the most proper quantity of powder is two thirds of the weight which would fill the cavity. A little space or liberty is left, that when a fusee or wooden tube *a*, *e*, of the figure of a truncated cone, is driven through the aperture, the powder may not be bruised. This fusee is pressed in at first by the hand as far as it will go, and then drove with a mallet as hard as possible, taking care, however, not to split it; for if the least crack were in it, the composition would give fire to the powder, and the shell would burst either in the mortar, or in the air, and thus do no execution. For the method of preparing and filling the fusee, see Fusee.

This fusee is set on fire, and burns slowly till it reaches the gun-powder, which goes off at once, bursting the shell to pieces with incredible violence; whence the use of bombs in besieging towns. Special care, however, must be taken, that the fusee be so proportioned, as that the gun-powder do not take fire before the shell arrives at the destined place; to prevent which, the fusee is frequently wound round with a wet clammy thread.

The fusees are driven into the shell, so as that only about an inch and a half come out beyond the fusee-hole; and then the shell is said to be fixed. They are charged long before there is occasion to use them; and in order to secure the composition with which they are filled, the two ends are covered with a mixture of two parts of pitch, one of rosin, and three of bees-wax, which will guard the composition within from the access of air; and it will thus keep as long as you please. When the fusee is to be put into the shell, the little end is opened or cut off; but the great end is never opened till the mortar is to be fired.

Bombs or shells are made of different magnitudes, from that of 17 or 18 inches diameter downwards; the very large ones are not used by the English, that of 13 inches diameter being the largest size now employed by them. The following table shews the weight, dimensions, &c. of English and French shells.

SHELLS.—Their Dimensions, Weight, &c.

Nature.	Weight.				Diameter.	Powder contained in Shells.		Powder for Bursting.		Diameter of Fusee Hole. Outside.		Diameter of Fusee Hole. Inside.		Thickness of Metal.
	Ct.	Qr.	lbs.	oz.	Inches.	lbs.	oz.	lbs.	oz.	Inches.		Inches.		Inches.
13 Inch	1	3	2		$12\frac{3}{4}$	10	4	6	12	1.837		1.696		2.05
10 ——	0	3	9		$9\frac{3}{4}$	4	5	2	10	1.57		1.45		1.575
8 ——	0	1	$11\frac{1}{2}$		$7\frac{3}{4}$	2	12	1	14	1.219		1.127		1.2
$5\frac{1}{2}$ ——	0	0	$15\frac{1}{4}$		$5\frac{1}{4}$	1	0	0	12	.894		.826		0.822
$4\frac{2}{5}$ ——	0	0	8		$4\frac{1}{5}$	0	7	0	5	.832		.769		0.653
H. Gren.	0	0	3	11	3.49									
	0	0	1	13	2.77			0	$1\frac{1}{2}$					
French Shells, in French Weights and Measures.														
Inches.	lbs.									Lines	Po.	Lines	Po.	Lines.
12-Inch	150				12	17	0	5	0	15	9	15	0	16
10 ——	100				10	10	0	3	0	15	9	15	0	16
8 ——	43				8	4	1	1	0	12	0	11	0	10
6 ——	23				6	2	8	0	12	11	0	10	6	10

Mr. Muller gives the following proportions, from the 13 inch bombs, now commonly used, and observes that they may be easily adjusted to any other calibre, by making the diameter of the shell to 30, as any part expressed in inches, to the same part expressed in parts of the diameter divided into 30 equal parts.

Diameter of the bore - - - -	30
Diameter of the shell - - - -	29.5
Diameter of the hollow sphere - - -	21
Thickness of the metal at the fusee-hole -	3.5
Thickness at the opposite part - -	5
Diameter of the fusee-hole - - -	4
	d
Weight of the shell unloaded,	——
	11.7
	d
Weight of the powder contained in the shell	——
	236.5

N. B. The letter *d* denotes the cube of the diameter of the bore.

But shells have also been lately made with the metal every where of the same thickness, and are found to burst into a greater number of pieces by this construction. The Germans do not name their shells from the diameter of the bore which receives them, but from the weight of a stone-ball that fits the same bore as the shell. Thus a 7lb. howitzer admits a stone-ball of that weight: the shell for this weighs 15lbs. and corresponds to the English $5\frac{1}{2}$ inch. The 30lbs. howitzer shell weighs 60lbs., and is rather more than 8 inches in diameter. At the siege of Gibraltar, small shells, as $4\frac{2}{5}$ inches, and hand-granades, were quilted into grape for 13-inch mortars. The fusees were turned inwards next the iron-tampion, and leaders of quick-match for communicating fire to the fusees were introduced through holes made in the wood-bottom, and placed as near the fusees as possible in the centre of the grape. These answered very well for short ranges. In general, the windage, or difference between the diameter of the shell and mortar, is $\frac{1}{60}$th of the latter; and the diameter of the hollow part of the shell is $\frac{7}{10}$ths of the same. For finding the weight of an iron-shell, the following rule has been given. Take $\frac{6}{94}$ of the difference of the cubes of the external and internal diameters, and this will be its weight. In order to find how much powder will fill a shell; divide the cube of the internal diameter of the shell in inches by 57.3, which will be the number of pounds of powder. To find the size of a shell for containing a given weight of powder; multiply the number of pounds of powder by 57.3, and the cube root of the product will be the diameter in inches.

Bombs only differ from granades, in that the latter are much less; and instead of mortars are thrown out of the hand. Bombs are thrown not only out of mortars and howitzers, but out of cannon. The following shells may be fired from guns; viz. hand-granades from 6-pounders; $4\frac{2}{5}$ shells from 12-pounders; $5\frac{1}{2}$ shells from 24-pounders; and 8-inch shells from 68-pr-carronades. Shells may be also thrown from guns to short distances, in case of necessity, though the bore be not of a diameter sufficient to admit the shell. For this purpose the gun may be elevated to any degree that will retain the shell upon its muzzle, which may be assisted by a small line passing from the lugs of the shell round the neck of the gun. To produce a greater effect, the space between the shell and the charge may be filled with wads, or some other substance.

Bombs may be used without mortar-pieces, in the manner practised by the Venetians at Candia, when the Turks had possessed themselves of the ditch, rolling down bombs upon them, along a plank set sloping towards their works, with ledges on the sides to keep the bomb right forwards. They are sometimes also buried under ground to blow up. See CAISSON.

M. Blondel, who has written on the art of throwing bombs, observes that the first bombs were those thrown into the city of Watchtendonch, in Guelderland, in 1588, though others pretend they were in use a century before, viz. at the siege of Naples by Charles VIII. in 1495. Stowe says (p. 584), that mortars and bombs were invented in 1544 by foreigners, whom Henry VIII. employed. But they came not into common use before the year 1634, and then only in the Dutch and Spanish armies. One Malthus, an English engineer, is said to have first carried them into France, where they were put in use at the siege of Collioure, in 1642.

The art of throwing bombs makes a branch of gunnery, founded on the theory of projectiles, and the laws and quantities of gun-powder.

Meſſ. Blondel, Guiſnée, de Reſſons, de la Hire, and others have written expreſsly on the art of throwing bombs.

Bomb-*battery*. See Battery.

Bomb-*cheſt*, is a kind of cheſt filled uſually with bombs, ſometimes only with gun-powder, placed under ground, to tear and blow it up in the air, with thoſe who ſtand on it.

Bomb-cheſts were formerly much uſed to drive enemies from a poſt they had ſeized, or were about to take poſſeſſion of: they were ſet on fire by means of a *ſauciſſee* faſtened at one end, but they are now much diſuſed.

Bomb, *water*. See Water-*bomb*.

Bomb-*veſſels*, which are ſmall ſhips formed for throwing bombs into a fortreſs, are ſaid to be the invention of M. Reyneau, or Renard, and to have been firſt uſed at the bombardment of Algiers, in 1681. Till then, it had been judged impracticable to bombard a place from the ſea.

The bomb-ketches on the old eſtabliſhment carry one 13-inch, and one 10-inch mortar; with eight 6-pounders, beſides ſwivels, for their own immediate defence. The modern bomb-veſſels carry two 10-inch mortars, four 68-pounders, and ſix 18-pounders carronades; and the mortars may be fired at as low an angle as 20 degrees; though theſe mortars are not intended to be uſed at ſea, but on very particular occaſions, their principal uſe, at theſe low angles, being to cover the landing of troops, and to protect our coaſts and harbours. A bomb-ketch is generally from 60 to 70 feet long from ſtem to ſtern, and draws eight or nine feet water. The tender is generally a brig, on board of which the party of artillery remain, till their ſervices are required on board the bomb-veſſel. The following inſtructions ſerve for their management and ſecurity in action.

1. A Dutch pump, filled with water, muſt be placed in each round-top, one upon the fore-caſtle, one on the main-deck, and one on the quarter-deck; and furniſhed with leather buckets, for a freſh ſupply of water.

2. The booms muſt be wetted by the pumps before the tarpaulins and mortar-hatches are taken off; and a wooden ſkreen, 5 feet ſquare, is to be hung under the booms, over each mortar, to receive the fire from the vents.

3. The embrazures being fixed and properly ſecured, the port muſt be let down low enough to be covered by the ſole of the embrazure. Previous to its being let down, a ſpar muſt be laſhed acroſs it, to which the tackles for raiſing it again muſt be fixed: this ſpar ſerves to project the tackles clear of the exploſion.

4. The mortars muſt not be fired through the embrazure at a lower angle than 20 degrees, nor with a greater charge than 5lbs. of powder.

5. Previous to firing, the doors of the bulk-head, under the quarter-deck, muſt be ſhut, to prevent the cabin being injured by the exploſion.

6. The bed muſt be wedged in the circular curb, as ſoon as the mortar is pointed, to prevent re-action; the firſt wedge being driven tight before the rear ones are fixed, in order to give the full bearing on the table, as well as the rear of the bed.—The holes for dog-bolts muſt be corked up to prevent the ſparks falling into them.

7. When any ſhells are to be uſed on board the bomb, they muſt be fixed on board the tender, and brought from thence, in boxes in her long-boat; and kept along-ſide the bomb-ſhip till wanted, carefully covered up.

8. In the old conſtructed bomb-veſſels it is neceſſary to hoiſt out the booms, and raft them along-ſide previous to firing; but in theſe new ones, with embrazures, only the boats need be hoiſted out; after which the mortars may be prepared for action in 10 minutes. See Ketch.

BOMBA, in *Zoology*, a ſpecies of Trichoda, one of the genera of Animalcule or Vermes infuſoria. This kind is briefly deſcribed as being of a changeable form, with a few hairs on the anterior part. This is found abundant in ſtagnant water; the body is thick, ſomewhat pellucid, of a yellowiſh colour, and filled with paler molecules. Müll. Gmel. &c.

BOMBARD, Bombarda, a piece of artillery anciently in uſe, exceedingly ſhort and thick, and with a very large mouth, by ſome alſo called *baſiliſk*, by the Dutch *donderbuſs*. Some derive the word, by corruption, from *Lombard*, as ſuppoſing this piece firſt uſed in Lombardy. Du-Cange, after Voſſius, derives it from *bombus* and *ardeo*; Menage, from the German *bombarden*, the plural of *bomber*, *baliſta*. But we doubt whether the Germans knew any ſuch word. It is no unuſual thing with Menage, and many other etymologiſts, to give derivations from words of their own making.

There were ſome of theſe pieces ſaid to have carried balls of 300 pounds weight; Froiſſart mentions one of fifty feet long. To load them, they made uſe of cranes, &c. The bombard is ſuppoſed to have been in uſe before the invention of cannon.

Bombards can hardly be ſuppoſed to have been of metal, nor charged with gun-powder. They were rather a ſort of baliſtæ for throwing ſtones, and were played with ropes.

BOMBARDE, in *Geography*, a fort and village of the iſland of St. Domingo, about 3 leagues N. of La Plate Forme; 6 S.E. of the Mole, and 22 from Port de Paix. N. lat. 19° 42′.

BOMBARDIER, an engineer, or perſon, whoſe buſineſs is to take care of the firing and throwing bombs out of mortars.—He firſt drives the fuſee, then fixes the ſhell, points, loads, and fires.

Bombardier, in *Entomology*. See Carabus.

BOMBARDING, the art or act of attacking a city or fortreſs, by throwing bombs into it, in order to ruin or ſet on fire the houſes and magazines, and do other miſchiefs.

Bombarding is not reckoned the moſt honourable method of making war, as it rather tends to do miſchief to the inhabitants than to the works.

BOMBARIN, in *Zoology*, the name uſed by ſome old writers for the Hippopotamus.

BOMBASINE, in *Commerce*, a kind of ſilk ſtuff manufactured at Milan, and thence ſent into France and other countries. The French alſo uſe the word bombaſine for ſtuff made of cotton, more properly called dimity.

BOMBAST, in *Rhetoric*, denotes a *ſtyle* too high and pompous for the ſubject and occaſion; or a certain manner of elocution and action, which is grand when ſupported by dignity in the ſentiment, and force in the expreſſion, but never fails to appear ridiculous where the ſentiment is mean, and the expreſſion flat. See Style.

BOMBAX, in *Botany*, (a name given to the common cotton tree by Serapion an Arabian phyſician in the beginning of the ninth century; Pliny had before called cotton Bombyx. Gr. βαμβαξ. Suid.) ſilk cotton. Lin. Gen. 835. Reich. 901. Schreb. 1127. Juſſieu, 275. Willden. 1284. La Marck. *Fromager*. Claſs and order *Monadelphia Polyandria*. Nat. Ord. *Columniferæ—Malvaceæ*. Juſſ.

Gen. Char. *Cal.* permanent, either of one leaf, tubular-campanulate, three, four, or five-cleft; or of five unequal leaves. *Cor.* either five petals, or one petal five-cleft. *Stam.* filaments five or more, connate at the baſe, ſometimes ſlightly, ſometimes tubular. *Piſt.* germ ſuperior, turbinate-oblong. Stigma capitate, with five teeth more or leſs developed. *Pericarp.* large ovate-oblong, membranous and almoſt woody, five-celled, five-valved. *Seeds* numerous, round, woolly. *Recept.* columnar five-cornered, forming the partitions.

Eſſ. Char. *Cal.* ſimple. *Capſule* ſomewhat woody, five-celled, five-valved. *Seeds* woolly. *Recept.* five-cornered.

Species, 1. B. *pentandrum.* (La Marck Tab. 587.) "Flowers pentandrous." Linn. "Anthers bent; leaves in ſevens." Willden. A tree ſixty or eighty feet high. Bark greeniſh, ſmooth, eaſily ſeparated from the wood; often ſprinkled, eſpecially when young, with large, conic, ſpinous tubercles; branches near the ſummit, pendant; leaves on long petioles, digitate, ſolioles from five to nine, either entire or ſerrate, lanceolate, ending in a point; flowers in a ſimple umbel; partial peduncles about an inch long, with ſeveral alternate bractes; petals five, white and velvety without, ſmooth, concave, and of a purple or delicate roſe colour within; anthers two or three, on a filament, twiſted together; fruit half a foot long, ſhaped like a cucumber, very ſlender at its baſe; ſeeds oval with a ſharpiſh point, enveloped with a great quantity of ſhort dark cotton which is not ſpun, but uſed for ſtuffing pillows, mattraſſes, &c. Rumphius ſays that the valves open at the baſe. Plumier aſſerts the contrary. Jacquin, who ſaw the living plant in fruit, gives no information on the ſubject. A native of both Indies. Cultivated by Mr. Miller in 1739. 2. B. *erianthos.* (Cavan. Tab. 152.) "Flowers pentandrous; anthers ſimple, erect; leaves in ſevens." Willd. Trunk very ſpinous; leaves terminated by a filament, very ſmooth; calyx ſhort and very large; petals three inches long, whitiſh, covered without with a ſhort thick down, ſmooth within, concave, and rounded at their extremity; tube formed by the lower part of the filaments, bottle ſhaped; anther linear, longitudinally fixed to the upper part of the filament. Found by Commerſon in Brazil. 3. B. *pyramidale.* "Stem without thorns; leaves cordate, angular; flower pentandrous; anthers united; fruit very long, pyramidal." Cavan. A large tree with very ſpreading branches; wood white and ſo light that fiſhers uſe it inſtead of cork; bark thick, fibrous, cinereous, marked with whitiſh ſpots, and reddiſh wrinkles; leaves a foot in diameter, ſtrongly nerved, green on the upper, yellowiſh and downy on the lower ſurface, on long and thick petioles; flowers numerous on long peduncles; coroll large, monopetalous, campanulate, deeply divided into five ſegments; calyx large, reddiſh, green, campanulate, with five blunt diviſions; filaments five, thick, ſupporting as many large nearly arrow-ſhaped anthers which are ſpirally united and encloſe the ſummit of the ſtyle; ſtyle reddiſh, club-ſhaped, marked at the end with five ſpiral furrows; capſule furrowed, from eight to ten inches long; ſeeds very ſmall, ſomewhat egg-ſhaped, enveloped with fine, ſhort, reddiſh cotton. A native of the Antilles. 4. B. *grandiflora.* "Leaves in ſevens; flowers pentapetalous, large, polyandrous; ſtamens united into a tube at the baſe." Cavan. Calyx large, expanding with four blunt diviſions; coroll ſuperb, of five petals, each five inches long, but narrow in proportion to their length, whitiſh, fleſhy at their baſe, velvety without, ſmooth within, and rounded at their extremities, inſerted at the baſe of the tube of the filaments, which is naked, entire in its whole length, and terminated by a prodigious number of red filaments a little ſhorter than the coroll; anthers kidney-ſhaped, ſmall and looſely attached to the filaments; ſtyle filiform, thick, longer than the ſtamens, with five ſmall teeth; fruit unknown. Deſcribed by Cavanilles from a ſpecimen in the Herbarium of Thouin. It grows about Rio-Janeiro. 5. B. *Ceiba.* "Flowers polyandrous; leaves in fives." Linn. Trunk cloſely armed with ſhort, ſtrong ſpines, ſo large as to be hollowed out into canoes of twenty-five tons burden; calyx ſmall, campanulate, with five ſmall teeth: coroll monopetalous; tube ſtraight, twice as long as the calyx; border divided into five long, concave obtuſe ſegments; filaments numerous, proceeding from five diſtinct bodies, which are united at the baſe and form a conic tube adhering to the baſe of the coroll; anthers oblong, looſe; germ ſomewhat ovate, with five angles; capſule oblong, ſmall at the baſe; ſeeds nearly round, covered with down, which is uſed by the lower ranks to ſtuff pillows and chairs. A native of South America, near Carthagena. Cultivated at Hampton Court in 1692. 6. B. *heptaphyllum.* "Flowers polyandrous; leaves in ſevens." Linn. "Stamens in five bodies." Cavan. A tree fifty feet high, ſix feet diameter at its baſe; wood ſoft, light, and brittle; bark thick, cinereous, ſpinous when young; leaves digitate; calyx four-cleft; flowers numerous, large, odorous; coroll of five petals, downy without, attached by its baſe to the bottom of the tube of the filaments; filaments very numerous, kidney-ſhaped, ſhorter than the coroll, looſely attached; fruit elongated. 7. B. *globoſum.* "Leaves in fives or ſevens, obovate, emarginate; fruit globular." Willd. (Aub. Guian. Tab. 281.) A tree thirty feet high; trunk a foot and a half in diameter; leaves palmate, green, ſmooth, oval, obtuſe, ſlightly crenulated at the ſummit, the middle one the largeſt, on long petioles, with two long, pointed, caducous ſtipules at their baſe; flowers unknown; fruit in axillary and terminating racemes. A native of Cayenne. 8. B. *goſſypium.* "Leaves five-lobed, acuminate, tomentoſe beneath." Linn. A large tree with green, nearly ſmooth bark; leaves alternate on long, ſlender, pubeſcent petioles; flowers large, in ſimple panicles on downy peduncles; calyx of five unequal leaves; petals five, as long again as the calyx, expanding, yellow; filaments numerous, ſlightly united at their baſe; anthers oblong, curved; capſule oval-obtuſe; ſeeds kidney-ſhaped. A native of the coaſt of Coromandel.

The ſpecies known to Linnæus were at firſt placed by him with the common cotton and its congeners, under the old Greek name Xylon; but afterwards ſeparated on account of the ſimple calyx. Thoſe with the double calyx he then called goſſypium; thoſe with the ſimple one bombax. The ſpecies of the genus bombax, as it now ſtands, differ ſo much from each other in moſt of the parts of fructification, as almoſt to juſtify the diviſion of them into diſtinct genera. The calyx, the coroll, the number and ſupport of the ſtamens, the form and inſertion of the anthers, all vary: nothing is conſtant but the ſimple calyx; the five-celled, five-valved capſule, and the woolly ſeeds. We have altered the natural and eſſential generic characters, and ſo formed them as not to exclude any of the ſpecies.

Propagation and Culture. Silk cotton is propagated by ſeeds ſown in a hot-bed in the ſpring. In about two months it ſhould be tranſplanted into a ſmall pot filled with freſh loamy earth, and plunged into a moderate hot-bed of tanners' bark. At firſt it ſhould be ſhaded from the ſun; but afterwards, when the weather is warm, ſhould be allowed freſh air, and frequent ſupplies of water in ſmall quantities, with a uniform degree of heat. In autumn it muſt be removed into the bark-ſtove and ſparingly ſupplied with moiſture. It makes a pleaſing variety in a large ſtove, but is not likely to produce flowers in England. See Miller, Gardener's Dictionary.

BOMBAY, in *Geography*, a ſmall iſland in the Indian Sea, near the weſtern coaſt of Hindooſtan, about 7 miles in length and very narrow, containing a very ſtrong and capacious fortreſs, a large city, a dock-yard, and marine arſenal. It is ſeparated on the N.E. by a narrow ſtrait from Salſette, another iſland, and theſe two, together with the neighbouring ſhores of the continent, form a large ſound, in which are ſeveral other iſlands, particularly Caranjah and Elephanta;

Elephanta; the latter (which see) being famous for its subterraneous temple, and both of them acquisitions from the Mahrattas. It was first taken possession of by the Portuguese, soon after their arrival in India, and called by them *Buon Bahia*, or Good Bay, from the excellence of its harbour, which is so spacious as to accommodate, as it is affirmed, a thousand ships at anchor, and well sheltered from all winds. The Portuguese ceded it to the English in 1662, as part of the dower of the Infanta, queen of Charles II. After the king's marriage, a fleet under the command of lord Malborough was sent to take possession of it; and sir Abraham Shipman was appointed governor. But upon their arrival in September 1663, the viceroy, actuated by the Popish clergy, who objected to the cession of the island to heretics, refused to surrender it. At length, however, in 1664, he was terrified into compliance, and a treaty was established, by which Mr. Cook, upon the death of Shipman, was invested with the possession of the island, in quality of governor. By this treaty the inhabitants were to be continued in the free exercise of their religion, and in the undisturbed possession of their estates under the crown of England. Although the trade of Bombay was at this time very prosperous, it was soon found, that the royal revenues were not sufficient for defraying the charge of the establishment, and that the trade itself was subject to very considerable obstructions; so that the king found it expedient to make a full grant in fee-tail of the port and territory to our East India Company, which was done by charter, dated 20th March 1668, and thus they have continued to hold it to the present time.

The city of Bombay, the principal port and settlement of the English in this part of India, is situated in the northern part of the island, N. lat. 18° 58′, E. long. 72° 38′. It is about a mile in length, but narrow; and defended both towards the sea and land with various fortifications, which have been constructed at a great expence, and which have rendered it the most considerable fortress in India. On the island also there are small forts sufficient for protecting it from any irruption of the Indians; and in the harbour there are basons hewn out in the rock, for the purpose of careening ships. The houses of Bombay are in general neither splendid nor commodious; but there are several handsome buildings, among which are the governor's palace, and a large, elegant church near it; the houses are not flat-roofed, as they are in other parts of the East, but they are covered with tiles in the European fashion. The English have glass windows. The other inhabitants of the island have their windows of small pieces of transparent shells framed in wood, which render the apartments very dark. The soil of the island is sterile, and incapable of any great improvement; its chief produce consists of cocoas and rice, besides mangoes and some Indian fruits. It draws a considerable supply of provisions from the continent, and from the fertile island of Salsette. Large quantities of salt are manufactured on the shore, from the sea-water that flows into pits adapted to this purpose. The sea-breezes and frequent rains cool the atmosphere, and render the climate of this island temperate; and though the air is not so pure as at Madras, yet it is much more wholesome than at Bengal; the coast of Malabar being pretty healthy, though less so than the coast of Coromandel. The island of Bombay has been rendered much more healthy than it was formerly, by a wall, which has been built to prevent the encroachment of the sea, where it formed a salt marish, by draining the marshes in its environs, and by an order that none of the natives should manure their cocoa-nut trees with putrid fish. Nevertheless, many Europeans, especially on their first arrival, are seized with fevers, fluxes, and other disorders, which prove fatal; and others shorten their days by not adhering to a mode of life suitable to the climate. The natives, however, and others, who abstain from excess of animal food and strong liquors, enjoy a good share of health, and live to a considerable age. The want of fresh water is an inconvenience to which the inhabitants are subject; the best being that which they preserve in cisterns after rain; whereas that which is supplied by their wells has a brackish taste.

This island is become very populous, in consequence of the toleration which is granted by the English to persons of every religious profession. The number of inhabitants is estimated by Niebuhr at 140,000, and of these the Europeans form the most inconsiderable class. The other inhabitants are Portuguese, or Indian Catholics; Hindoos, the original possessors of the country; Persians from Kerman; Mahometans of different sects; and some Oriental Christians. The English have a handsome church at Bombay, but they are disadvantageously circumstanced with regard to officiating clergy. The Catholics are much more numerous than the Protestants, and have many priests, as well Europeans as Indians, who attend their studies at Goa. The pope, many years ago, appointed for their superintendance a bishop of Bombay, but he was dismissed by the governor of the island. The Catholic churches are decent buildings, and are within sumptuously ornamented. The Jews had once a college and a synagogue in the middle of this island; but the college was converted into a country-house for the English governor, and the synagogue into a suite of assembly rooms.

Bombay is the seat of the English government for the coast of Malabar; as Madras is for the Coromandel coast, Calcutta for Bengal, and as Bencoolen was for Sumatra. These four governments, of which that of Bengal has the superiority and control, are obliged, by an act of the British parliament passed in 1773, (13 Geo. III. c. 63.) to afford mutual assistance in cases of extraordinary exigence. The different establishments are under similar administration, and all processes between subjects of the company are determined by the law of England. The council or regency of Bombay (as well as that of Bengal) consists of a governor and three members of council. The other servants of the company are factors and writers of different ranks, and are sometimes transferred from one department to another. The governor and members of council of the other presidencies are to be under the control of the government-general of Bengal, with respect to treaties with the native powers of India, levying war, making peace, collecting and applying revenues, levying and employing forces, or other matters of civil and military government; and they are required in all cases to obey the orders of the said government-general, unless the directors of the company shall have sent to these settlements any contrary orders not known to the government-general, of which, in that case, they are to give this government immediate advice. The Court of Directors are to appoint to these several governments, and likewise the commander in chief of all the forces, and the three provincial commanders in chief. All governors and counsellors are prohibited from trading, except from the company, 24 Geo. III. sess. 2. c. 25. 33 Geo. III. c. 52. See BOARD of *Controul* and *East India* COMPANY.

BOMBAY *Hook*, an island of America at the mouth of Delaware river, about 8 miles long and 2 broad, formed by the Delaware on the eastern side, and Duck Creek and Little Duck Creek on the Maryland side; these are united together by a natural canal. The N. W. end of Bombay Hook is about 47 miles from Capes Henlopen and May; from the Hook to Reedy Island is 9 miles.

BOMBAZINE Rapids, lie on a river in Lincoln county, and diſtrict of Maine in America, and are navigable for boats with ſome lading, at a middling pitch of water. They took their name from Bombazine, an Indian warrior, who was ſlain by the Engliſh in attempting to croſs them.

Bombazine, a lake, ſeven or eight miles long, in the townſhip of Caſtleton, county of Rutland, and ſtate of Vermont.

BOMBELLA, in *Entomology*, a ſpecies of Bombyx, of a middle ſize, that inhabits Auſtria, the wings of which are cinereous, ſprinkled with fuſcous. Fabr. Mant. This is *Tinea Bombycella* of the Vienna catalogue. (Wien. Schmet. terl.)

BOMBERG, Daniel, in *Biography*, one of the early printers, was a native of Antwerp, and ſettled at Venice, where, in 1518, he printed a folio edition of the Hebrew Bible. See Bible. He alſo began an edition of the Talmud, in 1520, and completed it ſome years afterwards in eleven volumes folio. Each of the three impreſſions of this immenſe work is ſaid to have coſt him 100,000 crowns. His whole property was devoted to the impreſſions of valuable editions of Hebrew Bibles and rabbinical works, for which purpoſe he employed a great number, as ſome ſay, more than 100 of learned Jews. Bomberg was himſelf a Hebrew ſcholar. He died about the middle of the 16th century.

BOMBIC Acid. The ſilk worm has a ſmall reſervoir near the anus, from which, when full grown, or eſpecially when in the chryſalis ſtate, a minute quantity of an acid liquor is ſeen to ooze out. If the entire animal is bruiſed, it gives a liquor containing the uſual ſoft animal matters, together with a native acid. Alcohol ſeparates the former, and leaves the latter in ſolution, which, by evaporation, furniſhes a very ſour pungent yellow fluid, which ſhews all the marks of an acid by reddening blue vegetables, and uniting with alkalies and ſome earths. The diſcoverer, Chauſſier, conſiders it as peculiar, and hence it has obtained a ſeparate place in the liſt of animal acids; but from analogy with the experiments on the *formic* acid, and other circumſtances, the ſeparate exiſtence of the bombic acid is very queſtionable. No other chemiſt has yet undertaken to confirm or diſpute the original ſtatement. Mem. de l'Acad. de Dijon. 1783.

BOMBICHIE, in *Geography*, a town of Aſia in Syria, 44 miles E. N.E. of Aleppo.

BOMBINA, in *Entomology*, a large ſpecies of Curculio, deſcribed by Fabricius, as a native of Cayenne. The colour of this inſect is ferruginous brown, and the wing-caſes ſtriated, with black elevated tubercles.

Bombina, in *Zoology*, a ſpecies of Rana, or frog, the belly of which is orange, ſpotted with ſky-blue, and the pupil of the eye triangular. Blumenb. This kind appears to be extremely variable in point of colour and markings. In the tenth edition of the Linn. Syſt. Nat. it is deſcribed as the *Rana variegata*. Roeſel, in his "Hiſtory of Frogs and Toads," calls it *Bufo igneus*, (bufo vulgo igneus dictus). It is likewiſe *La ſonnante*, and *le couleur de feu*, of Lacepede, and *Rana ignea*, or fire-frog, of Dr. Shaw.

The permanent varieties, if they may be ſo expreſſed, of this particular ſpecies, do not ſeem to be very correctly aſcertained. Gmelin, upon the authority of preceding writers, conſtitutes the following varieties: β has the belly black, with clear white ſpots and ſpeckles; γ is of a fuſcous colour; and δ is diſtinguiſhed by its loud ſonorous voice.

This is the ſmalleſt of the European kinds of either the frog or toad. The general habit reſembles that of a toad, but it is ſaid to leap and ſwim with as much or even greater facility than the common frog. Dr. Shaw obſerves, that he places it among the frogs inſtead of toads, on account of its depoſiting its ova in cluſtered heaps; not in ſtrings like the latter animals. In Germany, Italy, and other European countries, which this creature inhabits, it is known to delight in marſhy places. The ſound of the male, which alone is vocal, is clear and ſharp, and is thought by ſome to reſemble, in a very peculiar manner, that of a man giggling with laughter. This, indeed, is not the univerſal opinion; ſome authors compare it to the tone of a bell, or the note of a cuckow, for which reaſon it has obtained the name of bombycina.

This animal, according to Dr. Shaw, may be conſidered rather as an aquatic than terreſtrial ſpecies; being rarely found on land, but chiefly inhabiting turbid ſtagnant waters, in which, in the month of June, it depoſits its ſpawn, the ova being much larger in proportion than in moſt others of the genus. The tadpoles are hatched towards the end of June, and are of a pale yelloweſh brown colour; and, when young, are often obſerved to hang from the ſurface of leaves, &c. by a glutinous thread proceeding from the ſmall tube or ſucker beneath the lower lip. They arrive at their full ſize towards the cloſe of September, and at that period are remarkable for the fleſhy or muſcular appearance of the tail, which is ſtronger in proportion than in moſt other tadpoles. About the beginning of October they aſſume their complete or ultimate form; and when the tail has ſo far decreaſed as to be ſtill a quarter of an inch in length, that remaining portion becomes entirely obliterated in the ſpace of about twelve hours. The fire-frog is a lively active animal; leaping and ſwimming admirably well. When ſurpriſed on land, or unable to eſcape, it ſquats cloſe to the ground; at the ſame time turning back its head and limbs in a ſingular manner, and if farther teized and irritated, evacuates from the hinder part of the thighs, a kind of ſaponaceous frothy fluid, of no bad ſcent, but which, in ſome circumſtances, has been found to excite a ſlight ſenſation of acrimony in the eyes and noſtrils. This ſpecies is obſerved to breed at the age of three years, and may be ſuppoſed to live about ten; but this is not entirely aſcertained.

It ought not to eſcape remark, that the triangular form of the pupil of the eye, which Gmelin and others conſider as the moſt ſtriking criterion of this ſpecies, can only be obſerved in a full light, for when examined in the ſhade its ſhape is circular.

BOMBOESKJE, in *Zoology*, the Sciurus Asiaticus in Le Bruyn's It. p. 434, t. 254.

BOMBUS, in *Medicine*. See Flatulency.

Bombus, in *Muſic*, an artificial motion with the hands, imitating, in cadence and harmony, the buzzing of bees. The word is originally Greek, and ſignifies the buz or noiſe of bees, gnats, and the like. In this ſenſe, *bombus* made one of the ſpecies of applauſe uſed by the ancient auditories.

BOMBYCILLA Bohemica, in *Ornithology*, the name under which Briſſon deſcribes the Bohemian chatterer, *Ampelis Garrulus*. The ſame author likewiſe calls an American variety of this bird *Bombycilla Carolinenſis*.

BOMBYCINUM, in *Ancient Writers*, properly denoted a ſpecies of ſilk, brought from Aſſyria and the iſland of Cos. In which ſenſe it ſtood diſtinguiſhed from *Sericum*, another ſort of ſilk brought from the Indies.

Bomcycinum *velamentum*. See Velamentum.

BOMBYLIUS, in *Entomology*, a genus of Dipterous inſects, diſtinguiſhed by the following character: beak or ſucker very long, ſetaceous, ſtraight, and conſiſting of two unequal valves, within which three ſetaceous briſtles are contained; feelers two, ſhort and hairy: antennæ ſubulate, and connected at the baſe. Linn. Gmel. &c.

The antennæ of the inſects in this genus are ſhort, and contain three articulations, the firſt of which is long, the ſecond ſhort, and the third or laſt conicle, and terminating in

in a kind of appendage, almost forming a fourth joint, as is to be observed with the assistance of glasses. Those who have carefully examined the structure of the trunk with the microscope affirm, that the number of valves or bristles concealed within the external bivalve sheath are four instead of three, as Gmelin describes them. The antennæ are inserted at the base of the trunk.

Insects of this genus have the head comparatively of a small size, of a form somewhat rotund, and almost wholly occupied by the eyes. The thorax large, the abdomen bulky, and rounded at the extremity as in the bee. Both the thorax and abdomen are hairy, or covered with down. The wings longer than the body, and extended horizontally. Legs long and slender.

The size and rotundity of the body afford an excellent natural character, by which this tribe of insects may be distinguished from those of the genera empis and asilus, with which some naturalists have confounded them. The Fabrician species of volucella, cytherea, and anthrax, have been referred to the bombylius genus with very little propriety.

The true bombylius is a lively active tribe of insects, that subsist entirely on the nectareous juices they extract from flowers, with the assistance of their long proboscis or trunk. They fly with much rapidity, making all the time a soft humming noise similar to that of the bee. In England the largest species (major) has acquired the name of the humble bee fly. The insects of this tribe are found in the winged state in the summer, but their metamorphose is utterly unknown.

Only a small number of species in this genus are at present known, namely major, medius, minor, minimus, ater, fuscus, griseus, virescens, and albifrons: these are natives of Europe. The extra-European kinds are æqualis, capensis, cupreus, maculatus, pygmæus, and versicolor.

BOMBYX, a genus of Lepidopterous insects, or rather one of the subdivisions of the Phalæna, an extensive genus, in which all the insects of the moth tribe are comprised by Linnæus. Fabricius, in his "Entomologia systematica," admits the bombyx as a genus, applying the term phalæna, which Linnæus gave indiscriminately to all the species of the moth tribe, as a generical name to that particular description of moths which have the palpi cylindrical, the tongue advanced and membranaceous, and the antennæ filiform.

The true definition of the bombyces, whether considered as a subdivision of the phalæna, or as constituting a genus of themselves, is not sufficiently explicit. A great number of the species may be readily referred to their proper station in the genus, by observing with attention the characters laid down by Linnæus; but there are others which cannot be so accurately distinguished from the noctua as we could wish, by the assistance of those characters. If, for instance, we advert to the earlier editions of the Linnæan Systema naturæ, we shall find even in the small number of species which that naturalist describes, that the greatest confusion prevails in this respect. Had Linnæus been himself correct in his ideas of the natural character of the bombyces, we are almost persuaded he would not have considered phalæna bucephala as a noctua, any more than dominula, fuliginosa, jacobææ, and some others, which he includes as such in his arrangement of the lepidoptera.

Linnæus thought at first the pectinated antennæ of the lepidoptera a sufficient criterion of the bombyces, provided the wings were incumbent and depressed, while the insect remained in a resting position, because the geometræ, though often furnished with pectinated antennæ, have the wings expanded horizontally when at rest. But later observations of other naturalists have determined this character of the bombyx to be insufficient to distinguish it.

In the Systema naturæ, Linnæus divides the bombyces into sections in the following order; the *elingues*, or those without a manifest spiral tongue, and the *spirilingues*, having an involuted spiral tongue. These two principal sections are subdivided again; the *elingues*, into those with the back smooth or not crested,—with expanded wings,—with reversed wings,—with deflected wings,—with erect crests, or tufts on the back; and the *spirilingues*, those smooth, with expanded wings,—with deflected wings,—and with the back crested.

This mode of arrangement is entirely superseded by the Entomologia Systematica of Fabricius. The latter writer takes his characters, as usual, chiefly from the tongue and palpi. His bombyx is thus generically described; feelers two, compressed, reflected; tongue short, and membranaceous; antennæ filiform. By this many of the Linnæan bombyces are excluded, for the reception of which he establishes two other genera, those of Cossus and Hepialus, both of which most strictly appertain to the Linnæan bombyces. The bombyx cossus gave Fabricius the idea of forming a distinct genus of the species analogous to this insect. The characters, he lays down for the cossus are these; the palpi or feelers two, compressed, cylindrical; with no tongue; and the antennæ short and filiform. His hepialus has two hairy feelers, between which is the rudiment of a bifid tongue; and the antennæ are moniliform.

Gmelin, in the last edition of the Syst. nat. endeavours to reconcile the Fabrician genera as subdivisions to the principal Linnæan genus *phalæna*. His bombyces consist of the attaci, which have the wings expanded, and the bombyces (strictly so) which have not the wings expanded, and these latter are again arranged in subdivisions in the following order: first, those with reversed wings, as in *quercifolia*; second, those with deflected wings, as in *bucephala* and *hebe*; third, those with incumbent wings, as in *antiqua*; and fourth, those with convoluted wings, as in *bella*. The four families, into which Olivier separates the bombyces, scarcely differ from the preceding; they consist of those with expanded wings, with wings reversed, with wings bent down (deflected), and with wings recovered (incumbent).

The bombyces are to be considered as a true natural family of the moth tribe, which for the most part may be distinguished by the casual observer, who will attend to the structure of the antennæ, the form of the body, the position of the wings, and some few other particulars to be mentioned hereafter. The antennæ, which are filiform, and either pectinated or ciliated, differ greatly in the two sexes of the same species; the male being generally distinguished by having the antennæ much broader, or larger, than in the other sex. The thorax of the bombyx is rather more bulky, and the body thicker than in the noctuæ, especially in the females. Thus far consistent with the Linnæan character; but a strict attention to the feelers and structure of the tongue, as Fabricius observes, will be also necessary to determine many of the bombyces, which approach so closely to the noctuæ as not to be accurately distinguished by any other means. For this reason Fabricius is commendable in having endeavoured to define the precise limits between the bombyces and their analogous tribes: his character is more definite than that which Linnæus had previously assigned to this family. The discrimination of Fabricius is obvious in separating the two tribes or genera of cossus and hepialus from the bombyces, under which head Linnæus comprehends them; for those insects certainly form distinct natural families, both in their general appearance, their metamorphoses, their habits of life, and other peculiarities, from that which

which ought to be considered as the natural family of bombyces.

The insects of the bombyx tribe never fly except in the evening. During the day time they secrete themselves under the leaves, or beneath the branches, in the clefts of trees, where they may remain secure till about sun-set, at which time they appear to be on the alert, at first crawling about the branches, then fluttering their wings, and becoming briskier in all their motions as the evening comes on. The larger sort of moths, which we see first starting from the woods or hedges after some of the geometræ, are the *swifts*, the Fabrician hepiali, which fly swiftly as their trivial name implies, but low or near the surface of the ground; these at twilight are succeeded by the bombyces and noctuæ, whose flight is more elevated. They continue to sport about till it becomes quite dark. The males of the bombyces are commonly first upon the wing in search of the females, which latter are in some few species entirely destitute of wings, or at least have only the rudiments of them close to the thorax; in which case the female waits upon the trees or herbage for the arrival of the male; the female of bombyx antiqua, the vapourer moth, is a striking proof of this, for it has so little the appearance of a moth that any one, except an entomologist, would mistake it for an apterous or wingless insect. Those females which have wings are commonly larger even than the males.

The bombyces are produced from a larva, or as it is more usually termed by common observers, a caterpillar. This is of a long cylindrical form, having in some species a smooth skin, or in others more or less tuberculated; sometimes the skin is covered with a fine silky down, or with hairs; and some of the larger kinds are armed with spines and bristles. All the larvæ of the bombyces subsist on vegetables. Their jaws are strong, and of a horny texture, and below them is a small opening, through which the creature draws the silky thread of so much utility in its general economy. Most of these larvæ have sixteen feet, some have only fourteen feet, and others no more than twelve, six of which are hooked, and situated on the three first annulations near the head, the others towards the lower extremity of the body are short, broad, and very different in structure.

The greater number of species in the bombyx tribe, when in the larva state, lead a solitary life, in which case they separate as soon as they are hatched from the eggs, and crawl about to provide for themselves, the smallest of these even being able to obtain its own subsistence; they can eat as readily, and spin, or throw out the silky thread with as much facility as when grown bigger. The latter is of considerable utility to the larva, for when it wishes to descend from one branch of the tree or bush to another, instead of being obliged to pursue a circuitous course, by crawling or walking, it need only fasten one end of the silken thread to any particular spot and lower itself by its assistance to the branch desired; or when suspended mid-way between the branches, it can pass aside with a swing to any other point within a convenient distance. In like manner, when observed by birds or other enemies, it can drop in an instant and elude the enemy, waiting concealed below among the leaves or on the ground till the danger is over, and then remounting to the former spot by the aid of this thread. This is a provision of nature for the security of the larvæ of the bombyces, in common with that of other lepidopterous insects.

Some species of the bombyces live in societies, as may be observed, for instance, in *bombyx neustria* of entomologists, (the *lackey-moth* of English collectors). The larvæ of this species, by their united labours, spin a capacious habitation, in which the infant brood is hatched from the egg, and after undergoing their several transformations finally become moths.

Like other larvæ of the moth tribe, those of the bombyces cast their skin several times. When full grown, and approaching the pupa state, those of the bombyx kind spin a sort of web, in which we find the most valuable silk produced by these creatures at any time of their lives. The silk spun by the hairy larvæ is observed to be of little value, because the creature interweaves it with the hairs it plucks off its skin for this purpose. The common silk worm (*bombyx mori*), whose cocoon consists of the most valuable kind of silk, as is well known, has the skin perfectly smooth, or free from hair. There are certain species of the larger bombyces, the larvæ of which have smooth skins, but still beset with annular series of spines or bristles, that produce very strong silk, and are reared with the view of obtaining the cocoons for the manufacture of silk in the East Indies. The breed of these useful insects has long been cultivated in India, although the silk produced from them is very little, if at all, known in Europe. See SILK. The bombyces remain in the pupa state for a certain time, varying according to the species, some only a few days or weeks, others six or twelve months, two years, or even three. The same day that the creatures emerge from the pupa state they are in a condition to perpetuate their race. Almost immediately after coupling the males die; the females live long enough to deposit the eggs in a proper place for their security, and where the infant brood may find subsistence, after which they perish likewise.

The species of the bombyx tribe are numerous. Those already described by naturalists amount to a large number; and there are, in the cabinets of the curious, many more, especially of the extra-European species, that have never been described; even in the collections of this country, those of the latter description are numerous. The following are described by Linnæus and Fabricius, and enumerated by Gmelin: atlas, hesperus, aurotus, cecropia, paphia, polyphemus, cypria, cytherea, mulitta, promothea, erythrinæ, janus, megaera, hippodamia, nictitans, semiramis, boreas, luna, epimethea, argus, pavonia, minor, media, major, achelous, angulata, liberia, tau, jo, abas, salmonea, proserpina, fenestra, penelope, tyrrhea, perspicua, armida, militaris, castalia, populifolia, quercifolia, illicifolia, promula, cassandra, capensis, aluco, australasiæ, quadricincta, rubi, pruni, amphione, potatoria, ocularia, hibisci, cynira, cerasi, pini, trifolii, quercus, stigma, lusca, dumeti, catax, lanestris, vinula, fagi, versicolor, mori, populi, eueria neustria, tricolor, castrensis, franconica, taraxaconis, cinerea, mali, avellanae, processionea, pityocampa, rurea, atra, rufa, lagopus, imperialis, crassicornis, hyphinoë, cyane, bucephala, helops, oleagina, caja, pudica, casta, maculosa, virgo, menete, deflorata, tarquinia, tarquinius, hebe, villica, plantaginis, vittata, monacha, flava, lutea, dispar, amasis, chrysorrhœa, auriflua, bicolor, salicis, cassinia, centrolinea mendica, advena, rutila, lentifera, crataegi, eridanus, tibialis nitidula, plumigera, obsoleta, corones festiva, dryas, coryli, flavomaculata, nuda, furcula, curtula, reclusa anachoreta, anastomosis, testudo, asella, bufo, cippus, pudibundus, scopularia, fascelina, tremula, cæruleocephala, argentina, decora, rufa, dictæa, elegans tritophus, ziczac, dromedarius, terebra, cossus, palpina trepida, querna, gnoma, arenacea, morio, rubea, alphæa, purpurea, ceraria, murina, nebulosa, strigosa albida, aulica, helvola, undulata, lubricipes, lota, læta, communimacula, compressa, milhauseri, spreta, lincus, strigula, begga, vnigrum, russula, rufina, grammica, striata, matronula, parthenias, leporina, celsia, dione, capucina, camelina, oo, aesculi, antiqua gonostigma, paradoxa, zona, pylotis,

pylotis, graminis, popularis, fulminea, gloriosæ, crini, rosea, lusoria, cribrum, libatrix, lectrix, credula, dominula, hera, sanguinolenta, ricini, crotalariæ, colon, populeti, ancilla, consperfa, fuliginosa, ornatrix, priverna, francisca, jesuita, viciella, vestita, muscella, bombella, pectinella, annulata, grisea, jacobææ, rubricollis, pulchella, bella, histrio, and umber. To which are to be added bombyx figura Donov. Ind. Inf.; hepialus mappa Donov. Brit. Inf.; cossus labyrinthicus, argenteus, lituratus, and nebulosus, Donov. Inf. New Holland.

In adhering to the Fabrician system, in preference to that of Linnæus, we are to exclude from the foregoing list of bombyces the following species: lagopus, rostrata, sagitta, gemina, deflorata, and saga, all of which are to be referred to the Fabrician genus *hyblæa*; humuli, jodutta, lupulina, hecta, obliqua, carna, crux testudo, asella, bufo, and mappa, species of the *hepialus* genus of Fabricius: and cossus, unguiculatæ, terebra, aesculi, scalaris, pyrina, labyrinthicus, argenteus, lituratus, and nebulosus, which strictly belong to the Fabrician genus *cossus*.

Bombyx is also a name given to the Silk-*worm*.

Bombyx, in the *Ancient Music*, a kind of instrument, which, in Aristotle's time, was made of a reed, calamus, and, by reason of its length, was difficult to play on.

The word seems also to have been used for a key, or contrivance for shutting and opening the holes of wind instruments.

Bombyx, in the *Ancient Naturalists*, signifies indifferently either silk or cotton.

BOMENE, in *Geography*, a port town of Zealand, one of the provinces of Holland, on the north shore of Schouwin island, one league east of Brouwershaven.

BOMING, an island of Asia, in the mouth of the Ganges. N. lat. 22° 45′. E. long. 91° 25′.

BOMIO, in *Ancient Geography*, a station near Axbridge, according to Antonine's Itinerary; but placed by Camden and Gale at Boverton, in Glamorganshire.

BOMMEL, in *Geography*, a town of Holland, in the island of Over-Flahee, 7 miles W. of Willemstadt.

Bommel, a strong town of the duchy of Gueldres, seated on the Wahal, in the island of Bommel-Waert, first surrounded with a wall by Otho III. count of Gueldres, in 1229; 60 miles N. E. of Antwerp, and 7 N. of Bois-le-Duc. Bommel was taken by the republican troops of France, October 4, 1794.

Bommel-*Waert*, a kind of island, in the province of Gueldres, about five leagues in length from Louvestein N. W. to Fort St. Andrew S. E., and two in its greatest breadth, formed by the rivers Maes and Wahal. It is defended by three forts, viz. St. Andrew, Voorn, and Crevecœur. The first has five bastions, and was built in 1599 by the admiral of Arragon, and the cardinal Andrew of Austria, lieutenant-general of the Spanish forces; the second is situated at a small island, called Voorn, at the east end of Bommel-Waert, and was constructed by the prince of Orange, and on that account is sometimes called Fort Nassau; and the third is at the south side of the island towards Bois-le-Duc. These three forts were constrained to surrender to prince Maurice in the year 1600. In 1672, the French took the island under marshal Turenne, who, after destroying the fortifications, abandoned it in the following year. At the commencement of the religious disputes, count Charles de Mansvelt, passing this island with some Spanish troops, was encompassed by several Dutch ships under the command of count Hohenlo, who ordered the dykes to be opened, and thus totally inundated the island, so that the Spaniards were obliged to retire to the citadel, and would have miserably perished, if a sudden frost had not constrained the count to abandon the siege, and to allow them liberty to retire. In commemoration of this deliverance a chapel was built at Brussels, in honour of the immaculate conception of the Virgin, next the Dominican church, which, being destroyed in 1695, was afterwards re-built with greater magnificence. In 1794, the republican troops of France, having compelled the Dutch to abandon Bommel, overtook them in their retreat, and compelled a great part of them to surrender. They afterwards availed themselves of the frozen state of the Wahal, and were making progress towards Gorcum and Calenberg; but they were attacked by the British troops in conjunction with the Hessians, and driven across the river, with the loss of a considerable number of men and four pieces of artillery. But this temporary success was of no permanent avail for restraining the progress of the French army.

This island belonged to the province of Guelderland, except the town of Louvestein, which, with a very small district at the western end of the island, belonged to Holland.

BOMO, in *Ancient Geography*, a name given to the island of Eubœa, from the cattle with which it was stored; the ancient Arabian word *bomo*, or *bohmo*, signifying, according to Hesychius, cattle, or herds of cattle. This is, probably, the most ancient appellation; the island having been first peopled, as Strabo informs us, by the inhabitants of Arabia and Phœnice.

BOMOA, in *Geography*, a town of North America, in New Navarre, 10 miles S. of Cinaloa.

BOMONICA, in *Antiquity*, an appellation given at Sparta to the children, who, in the sacrifices of Diana, strove who should receive the greatest number of stripes with rods, which they sometimes continued to do the whole day, and even, as Plutarch relates, to death itself.

The word is formed from βωμος, *altar*, and νικη, *victory*; importing as much as *victor ad aras*, or *conqueror at the altars*.

BOMPART, Marcellus, in *Biography*, practised medicine at Clermont Ferrand the early part of the seventeenth century, and was aulic counsellor to the king. No memorials of his life are known; but his work "Miser Homo," in which he gives a succinct account of all the principal diseases afflicting the human frame, was much esteemed. It was dedicated to Pietre, Riolan, and Guy Patin; and to be patronised by them was highly creditable: also "Nouveau Chassé Pesté," Paris, 1630, 8vo.; and "Lettres d'Hippocrates traduites et commentées," 1632, 8vo. Haller. Bib. Med. Eloy. Dict. Hist.

BOMPEL, in *Geography*, a town of Hindoostan, in the Panjab, 15 cosses east of Seba, and 3 miles S. E. of Nadone, a town on the Beyah. N. lat. 31° 55′. E. long. 75° 57′.

BOMRAUZE, a town of Hindoostan, in the Carnatic, 58 miles W.N.W. of Madras, and 36 N. of Arcot. N. lat. 13° 24′. E. long. 79° 38′.

BOMY, a town of France, in the department of the straits of Calais, and chief place of a canton in the district of St. Omer, 8 miles S.W. of Aire.

BON, John, Le, in *Biography*, a native of Anterville, in Champagne, and eminent in his time for his knowledge in medicine, physician to the king of France, and to the cardinal de Guise, published, in 1571, "Therapeia Puerorum," 16to. Paris, "induced to it," he says, "by the ignorance of the surgeons, midwives, and tonsors, who attended women in child-birth. By their blunders and inexpertness in their art, many women lost their lives, and many children

children were deſtroyed." His work is very full on the ſubject, giving rules for the management of women before, during, and after parturition. He has left formulæ for a variety of ointments, with which he directs the pudenda of the women to be anointed, and which he thought conduced much to accelerate the birth of the child. When theſe failed, lapis ætites was to be tied to one of the thighs of the woman, and polipody of the oak to the feet. But theſe, he gravely admoniſhes, are to be taken away as ſoon as the child is born, leſt they ſhould draw away the womb alſo. Such mighty power was attributed to theſe trifles! It is probable, however, that the author only meant by theſe proceſſes to gain time, and to prevent the too haſty interference of the midwives, ſurgeons, &c.; and as there was nothing in the remedies that could injure the woman, who would frequently be delivered by the natural pains, during their uſe, he might not be ſorry to find the attendants attributing the ſafety of the woman and child, and the happy termination of the labour, to them. Whatever his real opinion might be, it is certain, that, among the people, theſe kinds of remedies acquired great credit, and the uſe of them was continued for near a century after his time. Among other objects that engroſſed the attention of this writer, we find him giving formulæ for ointments for ſmoothing the wrinkles of the abdomen, and for preventing the breaſts of women who had borne children from becoming large and pendulous. "Ne venter rugis indecorus," he ſays, "et ſtatens, eas viris ſuis ingratas, parum amabiles, et abominandas reddat; ne mammæ in majorem molem extendantur." His book appears to have been in great requeſt, as it paſſed through many editions, and is inſerted in the "Collection of Treatiſes on diſorders attending pregnancy and child-birth," by Caſpar Wolfius, publiſhed in 1586, re-edited by If. Spachius, fol. 1597, under the title of "Gynecia, ſive de mulierum morbis," from which the above quotations have been taken. Haller. Bib. Med.

Bon, John Philip, probably of the ſame family with John le Bon, publiſhed, at Padua, "De Concordantiis Philoſophiæ et Medicinæ," 4to. 1573; he was alſo author of ſeveral poetical works, which were much eſteemed in their time. Eloy. Dict. Hiſt.

Bon, in *Botany*, (*Alpinus*). See Coffea.

Bon, *Cape*, in *Geography*, called by the Moors *Ras-Addar*, and the promontory of Mercury, or Hermes, of the ancients, is a cape of Africa, in the kingdom of Tunis, in the Mediterranean ſea, diſtant 11 leagues E.S.E. from that of Zibeeb, and forming the eaſtern point, as Zibeeb does the weſtern, of the gulf of Tunis. It is ſo high, that from its ſummit the mountains of Sicily, diſtant more than 20 leagues, may be diſcovered in fair weather. See Ægimurus, and Dakhul. Cape Bon is ſituated about N.N.E. from Tunis. N. lat. 36° 50′. E. long. 11° 15′.

Bon, in *Modern Hiſtory*, the name of a feaſt celebrated annually by the Japaneſe in honour of the dead. On this occaſion they uſe a great number of lights, and run with eagerneſs to the tombs of their departed relations with ſuch choice meats as they conceive to be ſuited to the taſte and nouriſhment of the dead.

Bon, Fr.; *Buono*, Ital.; as *tems bon*, and *tempo buono*, uſed, in *Muſic*, to expreſs the accented parts of a bar. It is the firſt note of binary meaſure of two minims or two crotchets in a bar; the firſt note of the ternary meaſure of $\frac{3}{2}$ or $\frac{3}{4}$, and the firſt and third notes of common time. It is oppoſed to *tems mauvais* and *tempo cattivo*, the unaccented part of a bar. The French at preſent, diſtinguiſh theſe portions of a bar by the terms *tems fort* and *tems foible*, ſtrong and weak, and almoſt loud and ſoft parts of a bar. It is on the accented part of a bar that a diſcord regularly prepared is ſtruck, and reſolved on the unaccented part.

Bona, John, *Cardinal*, in *Biography*, was born at Mondovi, in Piedmont, in 1609, and entered at an early age into a reformed congregation of Ciſtertians. After having ſtudied philoſophy and theology at Rome, he returned to his own country, and became, in 1651, general of the congregation; and he was, at length, viz. in 1669, nominated a cardinal by pope Clement IX. Upon the death of this pontiff, he was thought of as a fit perſon to ſucceed him; but another was elected. The cardinal ſpent the remainder of his days in ſtudy and pious exerciſes, and died at Rome in 1674. He was the author of ſeveral works, chiefly of a devotional kind; ſuch as, "De Divina Pſalmodia, deque variis ritibus omnium eccleſiarum in pſallendis divinis officiis," 4to. containing an hiſtorical account of the practice of pſalmody in the Chriſtian church; and "Rerum Liturgicarum libri duo," 4to. giving a ſimilar account of the celebration of the maſs. Both theſe works have been often reprinted; and of the latter an edition much enlarged was publiſhed at Turin, in 1747, by father Salas, in 4 vols. fol. Gen. Dict.

Bona, John de, profeſſor of medicine at Padua, publiſhed, 1758, "Hiſtoriæ aliquot curationum, mercurio ſublimato corrodente, perfectarum," Veronæ, 4to. This medicine was much commended by baron Van Swieten, and forms probably the baſis of moſt of our noſtrums celebrated for their power of removing pimples, blotches, &c. from the face and other parts of the ſkin. It was intended by the author to ſuperſede ſalivation in the cure of lues venerea, and in ſome caſes it has been uſed with complete ſucceſs; but it too often diſappoints the expectation of the preſcriber, to be entirely depended on. "Tractatus de Scorbuto," 4to, 1761. The author ſhews that this diſeaſe, though moſt frequent in cold marſhy places, is not unfrequent in warm countries. "Dell uſo e dell abuſo dell caffé," Venet. 1761. Coffee, which is hot and drying, ſhould only be uſed, he ſays, by perſons of cold phlegmatic conſtitutions. In the quantity it is uſually taken in this country, it will ſcarce be hurtful to any habit or conſtitution. "Obſervationes medicæ ad praxim in noſocomio, anno," 1765, 8vo. Patav. 1766. Haller Bib. Anat.

Bona, in *Botany (Dodoens)*. See Vicia *Narbonenſis*, and Faba.

Bona *Nox*. See Smilax.

Bona, in *Geography*, a ſea-port town of Africa, in the eaſtern or Levantine government of the kingdom of Algiers, and province of Conſtantina; known to the Moors by the name of Blaid el Aneb, or the town of jujebs, from the plenty of fruit which is gathered in the neighbourhood. Bona, ſays Dr. Shaw (Travels, p. 46.), is, without doubt, a corruption of Hippo, or Hippona, though the ruins of the ancient Hippo-regius are ſituated ſomewhat more than a mile to the ſouth, and furniſhed materials for the erection of Bona, which is the Aphrodiſium of Ptolemy, and placed by him 15′ to the north of Hippo. Bona was formerly rich and populous, but is now poorly built and thinly inhabited. Bona, beſides its capacious harbour to the eaſt, had formerly a convenient little port under its walls towards the ſouth; but by the conſtant diſcharge of ballaſt into the one, and a neglect of cleanſing the other, both are rendered unſafe and incommodious. However, a great quantity of corn, wool, hides, and wax, are every year permitted to be ſhipped off from this place; and, by proper management, it might be rendered the moſt flouriſhing city in Barbary; and, by introducing a ſupply of freſh water, it would alſo become one of the moſt convenient and delightful. The

adjacent country produces corn and fruit, and great numbers of ſmall and large cattle, but is much expoſed to the incurſions of the plundering Arabs. The French have a factory at Bona, where they purchaſe corn, oil, leather, wax, and wool, and conſtantly keep a reſident agent, who has charge of the correſpondence between Bona, Algiers, La Calle, and Marſeilles. N. lat. 37°. W. long. 7° 50′.

Bona *Fortuna, Cape*, is a cape of Ruſſia, in the White Sea. N. lat. 65° 35′. E. long. 58° 25′.

Bona *Shoals*. See Bassaws.

Bona *Dea*, the *good goddeſs*, in *Mythology*, a myſterious kind of divinity, whoſe name was unknown to men, and whoſe ſacred rites, performed by the Veſtal virgins for the ſafety of the Roman people, were attended only by women. Some have ſuppoſed that this name belonged to Cybele, or the earth, as the ſource of all good things. Plutarch confounds her with Flora. Varro pretends that ſhe was the wife of Faunus; and that ſhe maintained her character for chaſtity to ſuch a degree, as never to allow herſelf to look upon any man beſides her huſband. Lactantius, on the contrary, ſays, that this wife of Faunus, having drank wine in violation of the prevailing cuſtom of the period in which ſhe lived, was whipped to death by her huſband with rods of myrtle; and that he, afterwards repenting of the deed, and lamenting the loſs of his wife, placed her in the rank of divinities. The feaſts of the Bona Dea were annually celebrated, with peculiar ſolemnity, on the firſt day of May. The houſe, in which the rites of the feſtival were performed, was adorned at a great expence; and as the night was the ſeaſon appropriated to this purpoſe, the apartments were illuminated with a great number of lights. The veſtals were conveyed into the houſe of the ſovereign pontiff, or one of the chief magiſtrates; and care was taken to exclude all males, and all animals of this ſpecies; and every thing maſculine was ſo ſcrupulouſly excluded, that even pictures of that ſort were covered during the ceremony. To this purpoſe, Juvenal (vi. 339.) ſays:

"——————— ubi velari pictura jubetur
Quæcunque alterius ſexus imitata figuram eſt."

It was ſuppoſed, that if a man by chance, and without any deliberate intention, became the witneſs of theſe myſteries, he would be ſtruck blind. Clodius, however, was guilty of polluting theſe myſteries. Whilſt Pompeia, the wife of Cæſar, with whom he had an intrigue, was, according to annual cuſtom, celebrating in her houſe the awful and myſtic ſacrifices of the "Bona Dea," Clodius determined to gain acceſs to his miſtreſs, even in the ſeaſon of her holy miniſtry. Accordingly, he dreſſed himſelf in a woman's habit, and by the benefit of his ſmooth face, and the introduction of one of the female ſervants who was in the ſecret, hoped to paſs without diſcovery. But by ſome miſtake between him and his guide, he loſt his way when he came into the houſe, and unluckily fell in among the other female ſervants, who, detecting him by his voice, alarmed the whole company by their ſhrieks, to the great amazement of the matrons, who preſently threw a veil over the ſacred myſteries, while Clodius found an opportunity of making his eſcape by the favour of ſome of the damſels. This ſtory was preſently ſpread abroad, and raiſed a general ſcandal and horror through the whole city. Cæſar put away his wife upon it; and perſons of all ranks were deſirous of availing themſelves of this circumſtance to get rid of a citizen, who by this, as well as other ſpecimens of his audacioufneſs, ſeemed born to create much diſturbance to the ſtate. It had been the conſtant belief of the populace, that if a man ſhould ever pry into theſe myſteries, he would be inſtantly deprived of ſight; but it was not poſſible, as Cicero ſays, to know the truth of it before, till Clodius ventured upon the experiment; though it was now found, as he tells him, that the blindneſs of the eye was converted to that of the mind. The affair was ſoon brought before the ſenate, and by them referred to the college of prieſts, who declared it to be an abominable impiety: upon which the conſuls were ordered to provide a law for bringing Clodius to a trial for it before the people. Clodius's faction, however, ultimately prevailed; and when the trial came to the iſſue, 25 condemned, and 31 abſolved him. When Cæſar, on this occaſion was ſummoned to give evidence, he declared, that he knew nothing at all of the matter, though his mother Aurelia, and ſiſter Julia, who were examined before him, had given a punctual relation of the whole fact; and being interrogated, how he came then to part with his wife? he replied, "that all who belonged to him ought to be free from ſuſpicion as well as guilt." Cicero, in his oration for Milo againſt Clodius, often refers to this ſacrilege, with a view of rendering his adverſary odious to the people. Many Roman writers have exclaimed againſt the licentiouſneſs and infamy of theſe myſteries, called by way of eminence the Roman myſteries, and celebrated on the 4th of December, though thoſe of the goddeſs Cybele were celebrated on the firſt of May. Nevertheleſs, this goddeſs is called *holy* in an inſcription recorded by Gruter, "Bonæ Deæ *Sanctæ* ſacrum, &c." Lucretius (ii. 598.) depicts the good goddeſs as bearing a mural crown, and drawn in a chariot by lions. She is alſo thus repreſented on the medals of the emperor Philip. The Greeks alſo had their good goddeſs, whom they denominated the goddeſs of women; and the Carthaginians paid divine honours to a goddeſs under this appellation, whom they believed to be Juno.

Bona *Fides*, or *Bona Fide*, is uſed in ſpeaking of things done with an honeſt intention, in oppoſition to thoſe done with a deſign of fraud and deceit, ſaid to be *mala fide*. In this ſenſe, we ſay, a grant, a conveyance, *bona fide*.

In many caſes, in the civil law, the *bona fide* of an action excuſes the want of ſome of the cuſtomary forms.

Contracts *bonæ fidei* among *Civilians*, ſtand contradiſtinguiſhed from thoſe *ſtricti juris*; the former being gained by plain honeſty and conſcience, which ſometimes include ſeveral things not expreſsly mentioned; whereas the latter are reſtrained to the expreſs terms of the deed. A buyer *bonæ fidei*, is he who really believed the thing to belong to the ſeller at the time when he purchaſed it. A poſſeſſor *bonæ fidei*, is he who is in poſſeſſion of a thing belonging to another, but which he truly believes his own. To be entitled to the benefits of next acceſſion, it is requiſite the perſons have poſſeſſed the thing *bona fide*, or really thought themſelves the proprietors.

Preſcription cannot ariſe from acts done *mala fide*; ſince what was unjuſt in its origin, can never be made juſt by time and continuance. See Prescription.

Bonæ *Fidei Actions*, thoſe wherein for farther light, the judge might take cognizance of things not mentioned between the parties.

Bona *Fide Judgment*, that wherein the parties are obliged to pay each other what is due *bona fide*, i. e. juſtly and equitably; and the judge has a power of eſtimating what is thus due to the actor or plaintiff; a power given him by the formula of the prætor, viz. *ex fide bona, vel quantum æquius melius*.

Bona *Geſtura*. See Good *A-bearing*.

Bona *Gratia*, a phraſe antiently uſed in ſpeaking of divorces, which were brought amicably about for ſome juſt reaſon, with the conſent of both parties, and without any

crime on the part of either, as in case of old age, disease, barrenness, monachism, captivity, or the like.

Bona *Defuncti ad colligendum.* See Colligendum.

Bona *Mobilia.* See Mobilia.

Bona *Notabilia*, in *Law.* Where a person dying has goods, or good debts, in another diocese, but within the same province, besides his goods in the diocese where he dies, amounting to the value of five pounds at least, he is said to have *bona notabilia:* in which case, the probate of his will, &c. belongs not to the bishop of the diocese where he dies, whose jurisdiction cannot extend beyond the bounds of his own diocese, but to the archbishop of the province.

Though if a person happens to die in another diocese than that wherein he lives, on a journey; what he hath about him above the value of five pounds, &c. shall not be *bona notabilia.*

Bona *Patria*, a jury or assise of countrymen, or good neighbours. See Assise and Jury.

Bona *peritura*, perishable goods. By stat. 13 Ed. I. cap. 4. the cargo of a ship that hath been cast away shall be kept for a year and a day, and restored to the rightful owner; but if the goods be such as will not endure so long, they are *bona peritura*, which the sheriff is allowed to sell, and to account in money for the value.

Bona *vacantia*, goods, such as royal fish, shipwrecks, treasure-trove, waifs, and estrays, in which no one can claim a property. These goods, by the law of nature, and by the imperial law, belonged to the first occupant or finder; but in the modern constitutions of European governments, they are annexed to the supreme power by the positive laws of the state.

BONACCIOLUS, Lewis, in *Biography*, a physician of great eminence and authority, practised medicine at Ferrara, in the early part of the 16th century. His great work "Æneas muliebris, sive de fœtus formatione," was first published in 1503, in fol. "qua, præter alia, plurima quoque ad coitum, et ad rem veneream facientia, dictione liberrima describuntur." It was nevertheless dedicated to Lucretia, daughter to pope Alexander VI. But the dedication, Blomenbach observes, is only to be found to the folio edition, princip. which is extremely rare. A copy of this edition was sold by Paterson, in 1791, with the splendid Paris library. This writer, Douglas says, was the first who distinguished the clitoris from the nymphæ, and shewed them to be distinct parts. The Æneas was again printed in 1587. It was also inserted by Caspar Wolfius in his Collection of Treatises, called "Gynecia, sive de mulierum morbis," 4to. 1586, re-edited by If. Spachius, fol. 1597; and with Pinæus's physiological treatises. Though of little value now, the work was for a long time held in great esteem; the author having given in it a more accurate anatomy of the fœtus, and of the partes generationi subservientes, than any preceding writer. Douglas Bib. Hal. Bib. Anat.

BONACHI, in *Geography*, a town of North America, in New Navarre, 180 miles S. of Casa-grand.

BONACOPUS, Hercules, in *Biography*, of Ferrara, and for some years professor in medicine at Bologna, published, in 1552, "De affectu quem Latini tormina appellant," 4to.; "De humorum exuperantium signis ac serapiis, de compositione Theriacæ, de modo preparandi aquam ligni sancti, &c." 4to. 1553; the latter medicine was now in the zenith of its reputation for its powers in curing the lues venerea; "De curatione pleuritidis, ab Hippocratis, Galeni, &c. monumentis deprompta," 4to. 1553. He died in 1558. Bonacopus had much learning, and contributed by his works to revive among his compatriots a taste for literature, particularly for the works of the ancient Greek fathers in medicine. His brother, or near relative, James Bonacopus, was also much in esteem. He was physician to pope Paul III. He died in 1553, aged 69 years. Astruc. de Morb. Gall. Haller. Bib. Med.

BONAFIDES, Francis, professor in the practice of medicine at Padua, published, in 1533, "Quæstio de cura pleuritidis per venæsectionem, adversus Curtium," 4to. Venet. He defends the practice of the Arabian physicians, who recommended bleeding by the vena saphæna, on the side opposite to the part affected, in plethoric habits; in debilitated constitutions by the basilica in the arm, of the side where the pain was felt; a distinction not attended to in modern practice. Haller. Bib. Med.

BONAIRE, in *Geography*, an island almost uninhabited, near the coast of South America, about 20 leagues from the continent, and 14 S. E. of Curaçoa, belonging to the Dutch. It is about 50 miles in compass, and has on the S.W. side near the middle of the island, a good bay and road. Here were formerly a few houses, with a fort guarded by a small number of soldiers; and five or six Indian families resided here, and cultivated maize, yams, potatoes, &c. The island has plenty of cattle and goats, which are anually salted and sent to Curaçoa. On the south side is a good salt pond, from whence the Dutch procure salt. N. lat. 12° 16'. W. long. 68° 18'.

BONAMES, a town of Germany in the circle of the Upper Rhine, 3 miles N. N. W. of Frankfort on the Mayne.

BONAMY, Peter-Nicholas, in *Biography*, was born at Louvres, in the district of Paris, in 1694, and educated for the ecclesiastical profession. But, devoting himself entirely to literature, he became under-librarian of St. Victor, and distinguished both by the politeness of his manners, and the variety as well as assiduity of his studies. In 1727, he was admitted a member of the Academy of Inscriptions and Belles Letters, and made many valuable contributions to its Memoirs. His papers are characterised by simple but correct language, variety of erudition, clearness of argument, and solidity of criticism. At the instigation of M. Turgot, a place was created of historiographer of Paris, and Bonamy was appointed to occupy it. He was thus led to write various memoirs relative to the history and antiquities of the city; and on occasion of a bequest of a curious library to the city, he was made librarian. From the year 1747, he conducted the "Journal of Verdun" with the strictest propriety and decorum. In universal esteem for candour and probity, as well as learning, he died at Paris, in 1770, aged 76. Gen. Biog.

Bonamy's *Point*, in *Geography*, lies on the southern side of Chaleur bay, at the N. W. extremity of Eel river cove, and forms the S. limit of Ristigouche river.

BONANA, in *Ornithology*, a species of Oriolus, of a fulvous colour, with the head and breast chesnut; back quill, and tail feathers, black. Gmel.

This is called by Brisson *xanthormus*, and *le carouge*. It is supposed to be the *xochitototl* of Hern. Mex. and *xochitotl altera* of Ray. Brown names it the bonana bird.

The length of this bird is seven inches: bill black; base of the lower mandible grey; head, neck, and breast chesnut; upper part of the back velvet black; lower part, with the rump, belly, thighs, and under the wings, a deep orange red; vent the same, tipped with chesnut; greater wing coverts, quills and tail, black; legs and claws grey. The female differs in having the colours less vivid than in the male.

The bonana bird is a native of Martinico, Jamaica, and the other islands in the West Indies, where it chiefly inhabits

bits woods. The neſt of this ſpecies is of a curious ſtructure, being compoſed of leaves and fibres of vegetables, ſewed with the greateſt ingenuity to the leaf of a banana plant, in ſuch a manner that the leaf itſelf forms one of the ſides to the neſt; when completed, it is ſaid to be exactly in ſhape of the fourth part of a globe.

Another bird, of a ſpecies very analogous to the above, is deſcribed by Ray and Sloane under the names of *watchy picket*, *Spaniſh nightingale*, *American hang-neſt*, and *icterus minor nidum ſuſpendens*. This appears to have been confounded with the former kind. Briſſon, deeming them both the ſame, included the ſynonyms of the two ſpecies together, which led later obſervers into an error. Dr. Latham ſeparates them; and, upon the authority of this able ornithologiſt, Gmelin gives the *watchy picket* as a diſtinct ſpecies under the name of *oriolus nidipendulus*. This ſpecific name is choſen, in alluſion to the manner in which the neſt is faſtened to the extremity of the further twigs of the trees in which it lives. The neſt of the bonana bird is before deſcribed; that of the watchy picket is very different, being of a long cylindrical form, compoſed of ſtalks, fibres, and the inward hairs of the "*old man's beard*," which latter bears a ſtrong reſemblance to horſe-hair. The two oppoſite methods of conſtructing, as well as placing the neſt, as Dr. Latham judiciouſly obſerves, cannot ſurely belong to one bird. See NIDIPENDULUS.

Obſ. Gmelin places the watchy picket, with a note of ſcepticiſm, as a ſynonym to *motacilla calidris*. This might poſſibly miſlead, without obſerving that Sloane, Ray, &c. deſcribe more than one bird under that name; the latter is the *American nightingale* of Edwards, and the *hang-neſt warbler* of Latham, the bird called the *watchy picket* by Sloane, Hiſt. Jam. 2. p. 299.

BONANNI, PADRE FILIPPO, in *Biography*, a Jeſuit, who publiſhed at Rome, in 1722, in 4to. drawings of a curious collection of muſical inſtruments, repreſented in the hands of the performers; entitled "Gabinetto Armonico Pieno d'Iſtromenti Sonori indicati e ſpiegati—ed offerto al ſanto Re David." The collection is curious, and the inſtruments are not ill executed; but we are not ſure that the drawings are always correct.

BONARATTE, in *Geography*, a ſmall iſland of the Indian ocean, ſouth-eaſt of Saleyer, ceded by the Macaſſers to a raja of Boni, in Celebes, who uſed it as a place of education for his dancing girls, and appropriated to the ſame purpoſe by the kings of Boni. It is chiefly inhabited by Bougeneſe.

BONARELLI, GUIDUBALDO, *Count*, in *Biography*, an Italian poet, was born in 1563, in the palace of the duke of Urbino, to whom his father was favourite miniſter; and, after previous inſtruction at home, was ſent to ſtudy theology at Pont à Mouſſon, in France, where he made ſuch proficiency, that he was invited, at the age of 19, to take the chair of philoſophy at the Sorbonne. He returned, however, into Italy, and was employed by Cæſar, duke of Modena, in ſome important negociations at the courts of Rome and France; but incurring diſgrace by his marriage, he withdrew to Ferrara, and, in 1607, publiſhed the paſtoral drama by which he acquired celebrity. This drama was acted by the academy of "Intrepidi" at this place, of which Bonarelli had been one of the founders. In his way to Rome, for the purpoſe of aſſuming the office of major-domo to cardinal Eſte, he was ſeized at Fano with a diſorder, which terminated his life, Jan. 8, 1608. The drama of Bonarelli, entitled "Filli di Sciro," was much applauded both in Italy and other countries at its firſt appearance, and was ranked by common opinion next to the Aminto of Taſſo, and the Paſtor Fido of Guarini. Although this paſtoral has many poetical beauties, it ſtrongly indicates the corrupt taſte which then prevailed; nevertheleſs it maintains its place among Italian paſtorals. Many editions of it have been printed: and it has been tranſlated into the French and Engliſh languages. Gen. Biog.

BONARES, in *Geography*, a town of Spain, in Andaluſia; one league from Lucena.

BONARIENSIS, in *Ornithology*, that ſpecies of LOXIA or groſbeak, deſcribed by Buffon under the name of *noir-ſouci*. The head and back of the neck are blue; body above blackiſh, beneath yellow; belly and vent ſulphur colour; wings and tail blackiſh, edged with blue.

This bird is about ſeven inches long, and is obſerved generally to fly in pairs; they haunt gardens, where they do much miſchief, as they feed on ſeeds. The bill is blackiſh; legs reddiſh; claws acute, curved, and grooved; the hind claw largeſt. This is the *marigold groſbeak* of Latham.

BONARIENSIS, a ſpecies of TANAGRA, that inhabits Bonaria. This is eight inches long; the colour black, gloſſed with violet, and with greeniſh on the wings and tail. Gmel. &c. Buffon calls this bird *tangavio*. The beak is black, the legs blackiſh, with large claws. The female is of a brown colour, with the head black, and gloſſed with blue.

BONARIENSIS, a ſpecies of MOTACILLA, of a black colour; throat and ſides ferruginous; face, chin, middle of the belly, and exterior tail feathers, white. This bird is of the ſize of a linnet; bill blackiſh; hind-claw large. Buffon calls this *demi-fin noir et roux*. It is the *white-chinned warbler* of Latham.

BONAROTA, in *Botany*, Michel. and Scopol. See PÆDEROTA.

BONASCOLA, in *Geography*, a town of Italy, in the ſtate of Genoa, near the ſea-coaſt, 4½ miles S.S.W. of Brugnetto.

BONASIA, in *Entomology*, a ſpecies of CICADA (*membracis*, *cruciata*) found in America. Fabricius deſcribes it as having the thorax bicornuted, produced behind, and edged with white; at the baſe of the wings is a white ſpot.

BONASIA, is alſo the name of a ſpecies of PAPILIO (*Heliconius*), the wings of which are fuſcous, with a common fulvous band; the lower pair ſpotted at the baſe with black.

BONASIA, in *Ornithology*. Under this name Briſſon deſcribes ſeveral ſpecies of the TETRAO genus; as for inſtance, *tetrao Canadenſis* he calls *bonaſia freti Hudſonis*; *tetrao Canace*, *bonaſia Canadenſis*; *tetrao lagopus*, *bonaſia ſcotica*; and *tetrao togatus*, *bonaſia major Canadenſis*.

BONASUS, in *Zoology*, one of the ſynonyms of the wild ox. See BOS TAURUS.

By ſome the bonaſus is underſtood to be that particular kind of wild ox which has the horns bent back, and the mane very long. Bonaſus of Pliny, &c. bos cornibus in ſe flexis, juba longiſſima. Linn. Syſt. Nat. The biſon is thought by Geſner to be the bonaſus of Ariſtotle.

BONAT, in *Geography*, a town of France, in the department of the Creuſe, and chief place of a canton, in the diſtrict of Gueret, 3½ leagues N. of Gueret.

BONAVENTURA, ST., in *Biography*, a cardinal of Rome, and entitled the "Seraphic doctor," was born at Bagnarea, in Tuſcany, in 1221; and having entered into the order of Minorites, in 1243, ſtudied at Paris under Alexander de Hales, and there taught theology with great applauſe. He received his doctor's degree in 1255, and in the following year was made general of his order. He declined accepting the archbiſhoprick of York, to which he

was nominated by pope Clement IV. in 1265; and, after his death, the choice of a ſucceſſor was referred by the cardinals to Bonaventura, who fixed on Gregory X. by whom he was made cardinal, and whom he attended to the ſecond council of Lyons, in 1274, where he died in the ſame year. He was canonized by Sixtus IV. in 1482, and declared a doctor of the church by Sixtus V. in 1588. His works have been collected in 8 vols. fol. and were printed at Rome in 1588; and an edition of them in 14 vols. 4to. has alſo been publiſhed. Among theſe are his "Life of St. Francis," the founder of his order, and "A Commentary on the Maſter of the Sentences," in which he appears to be a complete maſter of the theology of the 13th century. To him has been inſcribed the inſtitution of religious confraternities; and though his private character, and literary talents, are commended both by proteſtants and catholics, he has incurred ſome reproach for the zeal with which he promoted the worſhip of the virgin Mary, as the mother of God. Moreri. Encycl. Moſheim vol. iii.

Bonaventura, Frederic, an eminent ſcholar and phyſician of Urbino, in Italy, who flouriſhed in the early part of the 17th century, publiſhed, in 1601, "De natura partus octomeſtris, adverſus vulgarem opinionem, libri decem," Francof. folio; an enormous volume, containing upwards of one thouſand pages, on this unintereſting ſubject, in which he has introduced the opinions of different writers, and accounts of all the controverſies that have been held on the legitimate period of utero-geſtation in women. The author had publiſhed a diſſertation on the ſubject, in the preceding year, which he incorporated in the great work, but with which a modern reader would probably have been fully contented. Haller. Bib. Med.

Bonaventura, *Cape*, in *Geography*, is ſituate on the coaſt of New Guinea, in S. lat. 6° 15′, and about 65 leagues N.E. from port St. Auguſtine. The land is low and luxuriant, and produces the cocoa-nut, bread-fruit, plantain, &c.

Bonaventura, the name of an iſland, north-eaſt of the bay of Chaleur, off the coaſt of New Brunſwick, in the gulf of St. Lawrence, and a little to the ſouth-weſt of the point which forms the ſouth-eaſt entrance into that river; about a league from Gaſpé bay.—Alſo, an iſland on the ſtarboard ſide of the entrance into Porto-Bello harbour, oppoſite to the mouth of Guanches river. See Porto-Bello.

BONAVENTURE, or Buenaventura, a river, bay, harbour, and fort, on the coaſt of Papayan, in South America, nearly ſouth from Panama bay. N. lat. 3° 20′. W. long. 75° 18′. Barks and ſloops of 40 or 50 tons may go up to a village a league beyond the fort. Bonaventure is the ſtaple port of Cali, Papayan, Sta. Fé, &c.

Bonaventure, *Cape* and *Port*, are ſituated on the eaſt coaſt of Newfoundland, about ſouth-weſt of Bonaviſta cape, and form the north entrance into Smith's ſound, from whence the coaſt runs S. by W. into Trinity bay.—Alſo, a bay on the eaſt ſide of the iſland of St. Vincent. N. lat. 13° 9′. W. long. 61° 18′.

BONAVISTA, ſo called in reference to its beautiful appearance at ſea, the moſt eaſterly of the Cape de Verde iſlands, about 20 miles long, and 12 broad, and diſtant about 70 leagues weſt from the coaſt of Africa. Its ſurface is low towards the ſea, but within hilly, particularly towards the north-eaſt extremity, where is a hill, which, from its conical and truncated ſhape, appears to have been a volcano; and there is another hill, much higher towards the ſouth-weſt end, with high land to the weſtward of it. The ſoil is ſandy, barren, and uncultivated; milk, goats, fiſh, and turtle, are the principal food of the inhabitants. It affords ſome ſalt; and if the culture of it were not neglected, it would yield cotton and indigo. It is known at a diſtance by ſeveral white banks on its north ſide, where the ſhore is bold, and where a rapid river diſcharges itſelf into the ſea. This iſland has a good harbour on its weſt ſide, where veſſels may lie in 15 or 16 fathoms water. At the diſtance of a league or a league and a half from the ſouth-eaſt point of the iſland is a reef of rocks; and over this point, ſays Capt. Cook, there is a pretty high round mountain, riſing not far from the ſhore. This point, by his obſervations, is in N. lat. 16° 0′, and longitude from London, by account, 21° 51′ W. The latitude of the north end of the iſland is 16° 12′ N. and of the ſouth end 15° 57′ N. but that at the eaſt end was not aſcertained. Mr. Wales, in the ſecond voyage, determined the latitudes of theſe three points as follows: north point 16° 13⅔′ N. eaſt point 16° 3⅓′ N. and latitude of the ſouth point 15° 58′. N. Stavorinus ſays, that this iſland has two eminences of a middling height, that appear diſtinctly upon it; and that there are two reefs, one at the north ſide, and one at the ſouth ſide, which ſtretch out to the eaſtward, and which are both very dangerous. According to the account in lord Macartney's embaſſy to China, the ſea-coaſt, on the ſouth-eaſt ſide was guarded by rocks; but towards the ſouth-eaſt end the ſhore was much covered with white ſand. On that ſide there ſeemed to be neither cultivation nor inhabitants. The latitude of Bonaviſta, was 16° 6′ N. and the longitude 22° 47′ W. The variation 12° 36′ to the weſtward of the pole. This iſland belongs to the Portugueſe.

Bonavista, *Cape*, the extreme N. W. point of the iſland of Cuba in the Weſt Indies, opening into the gulf of Mexico, from whence the land falls off ſoutherly to cape St. Antonio.

Bonavista, *Cape and Bay of*, lie on the eaſt ſide of Newfoundland iſland, the cape lies in N. lat. 48° 54′, and W. long. 52° 33′, and was diſcovered by John Cabot and his ſon Sebaſtian, in 1497, under a commiſſion for exploring unknown lands, obtained from Henry VII. The bay is formed by this cape and cape Freels, 15 leagues apart.

BONAYE, a town of France in the department of the Lower Loire, and chief place of a canton, in the diſtrict of Nantes. The place contains 834, and the canton 9,530, inhabitants; its territory comprehends 135 kiliometres and 7 communes.

BONCAT, a town of France, in the department of the Lower Pyrenées, 6 leagues N. of Bayonne.

BONCHAMPS, a town of France, in the department of the Mayenne, 2 miles S. W. of Craon.

BONCONICA, Oppenheim, in *Ancient Geography*, a town of Gaul, placed between Mogontia to the north, and Borbatomagus to the ſouth, ſeated on the river Rhenus, in Germania prima.

BONCONVENTO, or Buon-convento, in *Geography*, a town of Italy, in the territory of Sienna, where the emperor Henry VII. died; 12 miles S. of Sienna.

BONCORE, Thomas, doctor in philoſophy, medicine, and law, in *Biography*, has left a memorial of a deſtructive peſtilence, which raged at Naples, where he was in high credit, as a practitioner in medicine, in the year 1622. "De populi, horribili, ac peſtilenti gutturis affectione, nobiliſſimam urbem Neapolim vexante, conſilium," 4to. 1622, Neap. An early account of the ſcarlatina anginoſa, or malignant ſore throat, which has of late years made ſuch frequent appearance, and proved ſo deſtructive, among children particularly, in this country. Eloy. Bib. Hiſt.

BOND, John, an Engliſh grammarian of the 16th century, was a native of Somerſetſhire, and after finiſhing his

his grammatical education at Winchester school, was entered, in 1569, at the age of 19 years, a student in the university of Oxford, where he was distinguished by his proficiency in academical learning. Having taken his degrees of bachelor and master of arts, the former in 1573, and the latter in 1579, he was promoted by the master and wardens of New College to the mastership of the free-school at Taunton, in Somersetshire, which office he occupied with reputation for several years. At length he quitted the laborious station of school-master, and directed his attention to physic, which he practised more for amusement than profit. He died in 1612, and was buried in the chancel of the church at Taunton. He wrote "Commentaries on Horace and on Persius."

Bond, or *Obligation*, in *Law*, is a deed whereby the *obligor*, or person bound, obliges himself, his heirs, executors, and administrators, to pay a certain sum of money to another called the *obligee*, at a day appointed. If this be all, the bond is called a single one, "Simplex obligatio;" but there is generally a condition added, that if the obligor does some particular act, the obligation shall be void, or else shall remain in full force; as payment of rent, performances of covenants in a deed, or repayment of a principal sum of money borrowed of the obligee, with interest, which principal sum is usually one half of the penal sum specified in the bond. In case this condition is not performed, the bond becomes forfeited or absolute at law, and charges the obligor while living; and after his death the obligation descends upon his heir, who, on defect of personal assets, is bound to discharge it, provided he has real assets, by descent as a recompence. So that it may be called, though not a *direct*, yet a *collateral*, charge upon the lands.

This security is called a "specialty;" the debt being therein particularly specified in writing, and the party's seal, acknowledging the debt or duty, and confirming the contract, rendering it a security of a higher nature than those entered into without the solemnity of a seal. In order to make a good obligation, it has been held that three things are necessary, *viz.* writing in paper or parchment, sealing, and delivery: but it hath been adjudged not to be necessary, that the obligor should sign or subscribe his name, sealing being deemed sufficient, and subscribing being no essential part of the deed. And though the seal be necessary, yet if the word sealed be wanting, it is remedied by verdict and pleading over, for all necessary circumstances shall be intended; and if it were not sealed, it could not be the deed or obligation of the party. Moreover, though sealing and delivery be essential in an obligation, it is not necessary to mention in the bond, that it was sealed and delivered, because, according to lord Coke, (2 Co. 5 *a.*) these are things which are done afterwards. The name of the obligor subscribed is sufficient, though there is a blank for his Christian name in the bond; and where the obligor's name is omitted to be inserted in the bond, if he signs and seals it, the court of chancery may make good such an accident.

An obligation is good, though it has no date, or a false or impossible date; the date not being of the substance of the deed; but the day of the delivery is the day of date, though no day be set forth. Every deed is supposed to be delivered and made on the day of its date; and if the plaintiff declare on a date, he cannot afterwards reply, that it was first delivered at another day. A plantiff may suggest a date in a bond which has none, or one that is impossible, &c. provided that the parties and sum are sufficiently expressed. A person shall not be charged by a bond, though signed and sealed, without delivery, or words, or other act, amounting to a delivery. But it may be delivered by mere words; and an actual delivery without speaking any word, is sufficient. If a bond be altered by interlineation in a material part, it becomes void, and it may be made void by rasure, &c. or by rasing the date, &c. after delivery. If the words at the end of the condition, "that then this obligation to be void," are omitted, the condition will be void, but not the obligation. If the condition of a bond be impossible at the time of making it, or be to do a thing contrary to some rule of law that is merely positive, or be uncertain or insensible, the condition alone is void, and the bond shall stand single and unconditional; for it is the folly of the obligor to enter into such an obligation, from which he can never be released. If it be to do a thing that is *malum in se*, the obligation itself is void; for the whole is an unlawful contract, and the obligee shall take no advantage from such a transaction. And if the condition be possible at the time of making it, and afterwards becomes impossible by the act of God, the act of law, or the act of the obligee himself, there the penalty of the obligation is saved; for no prudence or foresight of the obligor could guard against such a contingency. Co. Litt. 206. When a condition is doubtful, it is always taken most favourably for the obligor, and against the obligee; but so that a reasonable construction may be made as nearly as possible according to the intention of the parties. If no time be limited in a bond for payment of the money, it is due presently and payable on demand. 1 Brownl. 53.; and if a condition be impossible in respect of time, it shall be paid presently. Jones 140. 1 Leon, 101. If the party, who is bound to perform the condition, disables himself, this is a breach. A bond made with condition not to give evidence against a felon, &c. is void; but the defendant must plead the special matter. 2 Wilf. 341, &c. Condition of a bond to indemnify a person from any legal prosecution is against law, and void. 1 Lutw. 667. And if a sheriff takes a bond as a reward for doing of a thing, it is void. 3 Salk. 75. See Condition.

On the forfeiture of a bond, or its becoming single, the whole penalty was formerly recoverable at law; but here the courts of equity interposed, and would not permit a man to take more than in conscience he ought, viz. his principal, interest, and expences, in case of the forfeiture accrued by non-payment of money borrowed; the damages sustained, upon non-performance of covenants; and the like. And a similar practice having gained some footing in the courts of law, see 2 (Keb. 553. 555. Salk. 596, 597. 6 Mod. 11. 6?. 101.), the statute 4 and 5 Ann. c. 16. at length enacted, in the same spirit of equity, that, in case of a bond, conditioned for the payment of money, the payment or tender of the principal sum due, with interest and costs, even though the bond be forfeited and a suit commenced thereon, shall be a full satisfaction and discharge. The court of Chancery will not generally carry the debt beyond the penalty of a bond; yet in a case, where a plaintiff fought relief against such penalty, though it was decreed, it was on the payment of the principal money, interest, and costs; and notwithstanding they exceeded the penalty, this was affirmed, 1 Vern. 350. 1 Eq. Ab. 92. 6 Vin. tit. *Penalty*. 3 Comm. 435. And where the condition of a bond is to perform a collateral act, damages may be recovered beyond the penalty, and the court of K. B. will not stay the proceedings on payment of the money into court. 2 Term Rep 388.

All persons who are enabled to contract, and who are supposed in law to have sufficient freedom and understanding for that purpose, may bind themselves by bonds and obligations. 5 Co. 119. 4 Co. 124. 1 Roll. Abr. 340. If a person, illegally imprisoned, enters into a bond, during such restraint, to the person who causes it, the same may be avoided

avoided for dureſs of impriſonment. Co. Litt. 253. 2 Inſt. 482. The bond of a feme covert is *ipſo facto* void, and ſhall bind neither her nor her huſband. The bond of an infant, even for neceſſaries, with a penalty for payment, is void. But if an infant, feme covert, &c. enter with a ſtranger, who is not ſubject to their diſabilities, into an obligation, the ſtranger ſhall be bound by it. However, infants, idiots, ſeme coverts, and aliens, may be obligees. Sole corporations, ſuch as biſhops, prebends, parſons, vicars, &c. cannot be obligees; but a corporation aggregate may take any chattel, as bonds, leaſes, &c. in its political capacity, which ſhall paſs in ſucceſſion, becauſe it is always in being. Cro. Eliz. 464. Dyer, 48 *a*. Co. Litt. 9 *a*. 46 *a*. Hob. 64. 1 Rol. Abr. 515. If a drunken man gives his bond, it binds him; and a bond without conſideration is obligatory, and no relief ſhall be had againſt it, for it is voluntary, and as a gift. Jenk. Cent. 109. But on the general iſſue, the defendant may give in evidence that they made him ſign the bond when he was ſo drunk that he knew not what he did; and though a voluntary bond cannot be relieved againſt in equity, it may not be paid in a courſe of adminiſtration, ſo as to take place of real debts, even by ſimple contract; yet it ſhall be paid before legacies. 1 Chan. Caſ. 157. An heir is not bound, unleſs he be expreſsly named in the bond, though the executors and adminiſtrators are. Dyer 13. Two or more perſons may bind themſelves jointly in an obligation, or they may bind themſelves jointly and ſeverally; in which laſt caſe, the obligee may free them jointly, or he may free any one of them at his election; but if they are jointly and not ſeparately bound, they muſt be freed jointly; and in ſuch caſe, if one of them dies, his executor is totally diſcharged, and the ſurvivor or ſurvivors only chargeable. 2 Rol. Abr. 148. Dyer 19 310. 5 Co. 19. 1 Salk. 393. 1 Lutw. 696.

With regard to diſcharge of bonds, if a leſſer ſum be paid before it is due, and the payment is accepted, it ſhall be good in ſatisfaction of a greater ſum; but after the money is due, a leſſer ſum, though accepted, ſhall not be a ſatiſfaction for a greater ſum. Moore, 677. 3 Bulſt. 301. 1 Lutw. 464. It has been adjudged, that the acceptance of one bond cannot be pleaded in ſatisfaction of another bond. Cro. Car. 85. Moore, 872. Cro. Eliz. 716. 727. 2 Cro. 579. A bond, on which neither principal nor intereſt has been demanded for 20 years, will be preſumed in equity to be ſatisfied, and be decreed to be cancelled; and a perpetual injunction granted to ſtay proceedings thereon. 1 Ch. Rep. 79. Finch. Rep. 78. Satisfaction, moreover, may be preſumed within a leſs period, if any evidence can be adduced in aid of the preſumption, ſuch as the ſettlement of an account in the intermediate time, without any demand. Yet length of time is no *legal* bar; and is only a ground for the jury to preſume ſatisfaction. 1 Term Rep. 270. As to the pleading of performance of a condition, the defendant muſt ſet forth in what manner he has performed it. By ſtat. 8 and 9 Will. III. c. 11. § 8. in actions on bonds for performance of covenants, the plaintiff may aſſign as many breaches as he pleaſes, and the jury may aſſeſs damages. In debt on a bond, the defendant may have ſeveral pleas in bar. 1 Salk. 180. But a defendant in an action on a bond cannot plead, "Non eſt factum;" and a tender as to part. 5 Term Rep. 97. In debt on an obligation the defendant cannot plead, "Nil debet," but muſt deny the deed by pleading "Non eſt factum;" for the ſeal of the party continuing, it muſt be diſſolved, "Eo ligamine quo ligatur." Hard. 332. Hob. 218. In bonds to ſave harmleſs, the defendant being proſecuted, is to plead "Non damnificatus, &c." The ſtealing of any bond, bill, &c. for money, being the property of any one, is made felony, as if offenders had taken other goods of like value. Stat. 2 Geo. II. c. 25.

Form of a bond or obligation, with condition for the payment of money. "Know all men by theſe preſents, that I David Edwards, of Lincoln's Inn, in the county of Middleſex, eſquire, am held and firmly bound to Abraham Barker, of Dale-hall, in the county of Norfolk, eſquire, in ten thouſand pounds of lawful money of Great Britain, to be paid to the ſaid Abraham Barker, or his certain attorney, executors, adminiſtrators, or aſſigns; for which payment well and truly to be made, I bind myſelf, my heirs, executors, and adminiſtrators, firmly by theſe preſents, ſealed with my ſeal. Dated the fourth day of September, in the twenty-firſt year of the reign of our ſovereign lord George the third, by the grace of God king of Great Britain, France, and Ireland, defender of the faith, and ſo forth, and in the year of our Lord one thouſand ſeven hundred and ——."

The condition of this obligation is ſuch, that if the above bounden David Edwards, his heirs, executors, or adminiſtrators, do and ſhall, well and truly pay, or cauſe to be paid, unto the above named Abraham Barker, his executors, adminiſtrators, or aſſigns, the full ſum of five thouſand pounds of lawful money of Great Britain, with lawful intereſt for the ſame, on the fourth day of March next enſuing the date of the above written obligation, then this obligation ſhall be void and of none effect, or elſe ſhall be and remain in full force and virtue.

DAVID EDWARDS, (*L. S.*)

Sealed and delivered, being firſt duly
ſtamped, in the preſence of
GEORGE CARTER,
WILLIAM BROWNE.

Blackſtone's Com. ii. 340. Jacob's Law Dict. by Tomlins, vol. i. tit. *Bond*.

BOND of *Arbitration*. See ARBITRATION.

BOND, *Aſſignment* of. See ASSIGNMENT.

BOND, *bail*. See BAIL.

BOND, *counter*. See COUNTER-*bond*.

BOND of *reſignation*. See RESIGNATION.

BOND-*tenants*, are the ſame, in reſpect to the nature of their tenure, with copy-holders, and cuſtomary-tenants. Blackſtone's Com. vol. ii. p. 148.

Bond, in *Maſonry* and *Brick-laying*, is when bricks or ſtones are, as it were, knit and interwoven; and when they ſay, make good bond, they mean that the joints are not made over, or upon other joints; but reach at leaſt ſix inches, both within the wall and on the ſurface, as the art of building requires.

BONDAGE properly denotes a ſtate of ſervitude or ſlavery.

BONDAGE, *bondagium*, in *Engliſh Law Writers*, the ſame with VILLENAGE.

Tenants in bondage, paid heriots, and did fealty; they were not to fell trees in their own garden, without licence of the lord.

The widow of a tenant in bondage held her huſband's eſtate, *quamdiu vixerit ſine marito*.

BONDAGE *by the forelock*, or *bondagium per anteriores crines capitis*, was when a freeman renounced his liberty, and became ſlave to ſome great man; which was done by the ceremony of cutting off a lock of hair on the forehead, and delivering it to his lord; denoting, that he was to be maintained for the future.

Such a bondman, if he reclaimed his liberty, or were fugitive from his maſter, might be drawn again to his ſervitude by

by the nose; whence the origin of the popular menace, *to pull a man by the nose.*

BONDELIA, in *Ancient Geography*, a town of Italy, in Etruria. Ptolemy.

BONDENO, or BUONDENO, in *Geography*, a town of Italy, in the duchy of Ferrara, at the conflux of the Panaro and Po, 9 miles W. of Ferrara.

BONDMAN, BONDUS, formed from the Saxon *bond*, signifying a *fetter*, in the *English Law*, is used for a villain, or tenant in villenage. See VILLAIN.

The Romans had two kinds of bondmen; one called *servi*, who were those either bought for money, taken in war, left by succession, or purchased by some other lawful acquisition; or else born of their bondwomen, and called *vernæ*. Both are called in our law villains in gross, as being immediately bound to the person and his heirs. We may add a third kind of bondmen mentioned by Justinian, called *adscriptitii glebæ*, or *agricensiti;* who were not bound to the person, but to the ground or place, and followed him who had the land. These, in our law, are called *villains regardants*, as belonging to the manor or place.

In the English as well as Scottish laws, those called by the Romans *vernæ*, are sometimes also denominated *nativi*, as being born on the land. See NATIVUS.

BONDORF, in *Geography*, a country of Germany, in the circle of Swabia, about five leagues long, and between one and three broad, lying between the Brisgaw and the landgraviates of Baar and Stuhlingen. It had formerly lords of its own, but in 1613 was purchased by the abbey of St. Blaise. It is assessed in the imperial matricula, at 25 florins, 30 kruitzers; and its contingency to the chamber, at Wetzlar, is 12 rixdollars, 15½ kruitzers. This territory comprehends the town of Bondorf, 28 miles N.N.W. of Zuric, and several villages.

BONDOU, a kingdom of Western Africa (formerly a part of the kingdom of Bambouk), the capital of which is Fatteconda, near the eastern bank of the river Faleme. This kingdom is bounded on the north by Kajaaga, on the east by Bambouk, on the south-east and south by Tenda and the Simbani wilderness, on the south-west by Woolli, and on the west by Foota Torra. It lies between N. lat. 13° 32′ and 14° 32′, and between W. long. 10° 8′ and 11° 18′. Mr. Park, in his journey through this kingdom towards the east, found that the country, though covered with woods, like that of Woolli, rose into hills, especially towards the Faleme river, and that the soil varied to a considerable degree; but wherever the land was cleared, great natural fertility was observable. Bondou, in particular, may literally be pronounced "a land flowing with milk and honey." Both these articles, together with rice, and Indian corn of two or three species, were to be obtained at a small expence. Of their honey, the unconverted or pagan natives make an intoxicating liquor, much the same as the mead, or metheglin, of Europe; and this, and the wine of the palm-tree, constitute their principal liquors. The price of a fowl in Bondou was a button, or a small bit of amber; goat's flesh and mutton were proportionably cheap; and for six or eight amber beads Mr. Park might at any time have purchased a bullock. The domestic animals are nearly the same as in Europe. Swine are found in the woods, but their flesh is not esteemed. Probably the marked abhorrence with which this animal is held by the votaries of Mahomet has spread itself among the Pagans. Poultry of all kinds, the turkey excepted, may be had every where. The Guinea fowl and red partridge abound in the fields; and the woods furnish a small species of antelope, of which the venison is highly and deservedly prized. Of the other wild animals in the Mandingo countries, the most common are the hyæna, the panther, and the elephant. But of the method of taming the latter animal, and applying his services to the use of man, the natives of Africa are totally ignorant; and when they were told by Mr. Park, that this was done in the east, they treated the information with contempt, and exclaimed "Tobaubio fonnio," i. e. the white man's lie. They find means, however, to destroy the wild elephants by fire-arms for the sake of their teeth, which they transfer in barter to those who sell them again to the Europeans. They eat the flesh, and deem it a great delicacy. The pastures of Bondou furnish an excellent breed of horses; but the usual beast of burthen in all the negro territories is the ass. The application of animal labour to the purposes of agriculture is no where adopted, and the plough is an instrument altogether unknown. The chief implement used in husbandry is the hoe, which in different districts is of various forms; and labour is universally performed by slaves. The Mandingoes cultivate, besides the grains proper to tropical climates, ground-nuts, yams, and pompions. They likewise raise cotton and indigo, and they produce of these materials a tolerably fine cloth, of a rich blue colour; and they make good soup from a mixture of ground-nuts and a ley of wood-ashes. Their trade with the whites is composed of slaves, gold-dust, ivory, and bees-wax. Their inland traffic consists chiefly of salt, which is procured from the Moors, in barter for corn and blue cloth, and of warlike stores which are obtained from the European traders on the Gambia river. These are sold again to itinerant merchants, called "Slattees," who come down annually from distant countries, with slaves, and a commodity called "Shea-toulou," which is an excellent sort of butter, produced from the kernel of a nut boiled in water. They also bring down small quantities of iron, which is manufactured in the interior districts; but those articles of this metal which are in use among the natives of the coast, are made of iron from Europe. The natives of the Gambia countries are also supplied, in considerable quantities, with sweet smelling gums and frankincense, which are the produce of Bondou.

Bondou is chiefly inhabited by Foulahs, a race of negroes, who lead a wandering life, and employ themselves chiefly in the pasturage of cattle, and the cultivation of corn. Among these, however, are a great number of Mandingoes, by whom the trade of the country is chiefly conducted. The government in Bondou, and in all the adjacent petty states, is monarchical, but no where absolute. The persons, who are called chief-men, constitute a sort of aristocracy, which serves much to restrain the powers of the sovereign. The king cannot declare war, nor conclude a peace, without their advice. When Mr. Park visited Bondou, the king was a "Soninkee," or Pagan, like the king of Woolli; but he had adopted the Moorish name of Almami, and with the name he seemed to have imbibed somewhat of the Moorish disposition; for although the traveller had presented to him his umbrella, and some other articles, he compelled him, as he had before compelled major Houghton, to strip in his presence, and surrender his coat, which, he said, he should reserve for his own wearing, on great and public festivals. In return, however, he gave Mr. Park five minkallies (drams) of gold-dust, and loaded him with provisions. Every considerable town is under the immediate government of a magistrate, called the "Alkaid;" by whom the duties and customs on itinerant traders, which are paid in kind (the only system of taxation), are levied. The office is hereditary. The people of the lower classes are in a state of slavery, or vassalage, to individual proprietors; but the power of the master is far from being unlimited. He may punish his slave

ſlave corporally; but cannot deprive him of life for any offence, nor even ſell him to a ſtranger, without firſt bringing him to a public trial, called a "Palaver," before the chief men of the town; and on ſuch occaſions the cauſe of the ſlaves is pleaded by the native Mahometans, who are a ſort of profeſſional advocates. Theſe indulgences indeed extend only to native or domeſtic ſlaves; for captives taken in war, and thoſe who are obtained in traffic, may be ſold at pleaſure, and treated as the owner thinks proper. Park's Travels into Africa. Rennell's Proceedings of the African aſſociation.

BONDOUR, a town of Aſiatic Turkey, in the province of Natolia, 24 miles weſt of Iſbarteh.

BONDRE'E, in *Ornithology*, the honey buzzard *(falco apivorus,)* ſtands under this name in Buffon's Hiſtory of Birds. The French writers of the preſent day alſo call it bondrée.

BONDUC, and Bonducella, in *Botany*, (Plumier). See Guillandina.

BONDUCH, in the *Materia Medica*, a name by which many authors have called the Molucca, Marſao, or Bezoar nuts.

BONE, in *Anatomy*. The bones are the moſt ſolid parts of animals, and may be regarded as the walls of a building ſupporting and containing the other parts. The human body is compoſed of a pile of bones, the extremities of which are variouſly ſhaped, and adapted to each other, and calculated to admit of a variety of motions. Bones appear to be compoſed of a vaſcular ſubſtance, not differing materially in ſtructure from that of the reſt of the body, except that there is depoſited in its interſtices phoſphat of lime, which gives to the whole maſs rigidity, ſtrength, and a permanent figure. That ſtate of the veſſels in which they ſecrete, and depoſit, earthy matter, occurs in diſeaſes of other parts of the body. The nutrient veſſels of arteries, membranes, and ligaments, occaſionally depoſit lime, and cauſe the oſſification of thoſe parts. The earth of bone is alſo depoſited in ſome ſpecies of tumours, and often in conſiderable quantity, and in an irregular manner in the cellular ſubſtance of a limb, when the bone of it is diſeaſed. After this general view of the ſubject, we proceed to give an account of the ſtructure of a bone, both with reſpect to the arrangement of its earthy particles, and with relation to its vaſcular texture.

It is cuſtomary, however, in giving an account of the ſtructure of bones, firſt to deſcribe their original formation in the fœtus; and this is uſeful, becauſe it demonſtrates the ſimplicity of the proceſs, and tends to refute old and erroneous ideas reſpecting it. The parts of the young fœtus which are afterwards to become bones, are merely a vaſcular, gelatinous ſubſtance, ſcarcely diſtinguiſhable from the other parts; afterwards the outline of the bone becomes evident, and its ſubſtance is rendered white and firm, in proportion to the quantity of lime depoſited in it. The quantity depoſited in it, even at the time of birth, is only ſufficient to give firmneſs to the whole maſs, but not to prevent its flexibility. The extremities of all the long bones conſiſt of large portions of cartilage, and theſe, by degrees, become bony. This change is effected by an alteration, firſt, in the organization of the part; the cartilage is abſorbed, the veſſels enlarge, ſo as to admit of injection, and then they appear to have the power of depoſiting earthy matter, or forming bone. The formation of bone begins in the centre of a cartilage, and gradually extends from thence to the remote parts, ſo that the ſeparate piece of bone, formed at the extremity, remains to nearly the period of puberty, conjoined to the body of the bone, by a cruſt of cartilage. In this ſtate it is technically termed an epiphyſis. The obſervation of theſe facts led formerly to the erroneous notion, that it was neceſſary that cartilage ſhould exiſt, prior to the formation of bone; and that it was converted by preſſure, or in ſome inexplicable manner, into bone. It were a waſte of argument to refute this opinion. We can perceive a ſtriking advantage that reſults from the bones of the fœtus being formed as they are. Their flexibility admits of the form of limbs becoming adapted to the varying figure of the pelvis, through which they muſt paſs, and their elaſticity, which is powerful, reſtores them afterwards to their natural ſhape.

The ſubject which firſt engages our attention, in examining the ſtructure of bone, is the arrangement of the earthy parts. The phoſphat of lime is depoſited by the arteries in minute points or particles, and theſe being placed lengthwiſe, with reſpect to each other, form fibres; again theſe fibres being placed parallel to one another, form bony plates, ſcales, or laminæ. That bones are fibrous and laminous, is evident from a mere inſpection of them in the fœtal ſtate; that they are ſo in the adult ſubject may be demonſtrated by calcination, or long expoſure to weather: in which caſes the connecting vaſcular ſubſtance is more ſuddenly or ſlowly diſſipated, and thus the arrangement of the earthy matter is rendered viſible. The earthy fibres of long bones extend themſelves in a direction parallel to the axis of the bone; in broad bones they ſhoot out in every direction, like rays from a centre. In long bones the earthy matter is conſolidated in the circumference and ſides, ſo as to form thick and ſtrong walls; whilſt a tube or more ſpongy bony ſtructure is found in their centre. In broad bones a ſimilar ſtructure is obſerved; the earthy matter is conſolidated exteriorly, ſo as to form denſe plates or tables; whilſt interiorly the fabric of the bones is ſpongy or cancellous. In the internal ſpongy part of bones the marrow is depoſited. In the middle part of long bones the walls are very thick, being compoſed of a great number of bony lamellæ, and theſe walls gradually become extenuated as they approach to the extremities of the bone, where they are proportionally very thin. Long bones are alſo ſlender in the middle, but at the ſame time ſtrong, on account of the great quantity of earthy matter thus conſolidated to form their walls; whilſt there is but little cavity or medullary ſtructure. Theſe bones expand greatly at their extremities, in order to afford an extent of ſurface for the formation of joints, and for the ſupport of the weight of the body. In the extremities of long bones, though the walls are thin, there yet exiſts a great deal of bony matter, which is depoſited ſo as to leave interſpaces between its fibres, forming what is termed the cancellous ſtructure, or lattice-work of bones. It has been therefore concluded, that the quantity of earthy matter may be nearly equal in each part of a bone, and give to it an equal degree of ſtrength; but that it has this difference of arrangement, that in the middle it is compacted ſo as to form very thick and denſe walls, occupying but little ſpace, and leaving but little internal cavity, whilſt in the extremities it occupies a greater ſpace, and forms a leſs ſolid kind of fabric. It would be deſirable to aſcertain, with ſome preciſion, where ſimilar circumſtances are to be met with in broad bones; and though no preciſe rules can be given, yet this may be admitted as a general truth, that where a broad bone ſwells out into a protuberance, there we ſhall find the walls or tables thin, and the cancellous ſtructure abundant; and, on the contrary, where a broad bone is condenſed ſo as to occupy but little ſpace, there we ſhall find the tables proportionately thicker, and the cancellous ſtructure leſs in quantity.

Having thus deſcribed the arrangement of the earth of bones, we may next enquire into the advantages which reſult from this ſtructure. The long bones are made ſlender

in the middle, to allow of the convenient arrangement of large muſcles round them; they become expanded at their extremities to afford an extent of ſurface for the formation of joints, and the ſupport of the weight of the body. A cavity is left in the middle; for if all the earthy matter had been compacted into the ſmalleſt poſſible ſpace, the bones would have been ſuch ſlender ſtems, as to be very unſuitable to their offices; and if they had been of their preſent dimenſions and ſolid throughout, they would have been unneceſſarily ſtrong and weighty. Beſides, it can be proved by mathematical demonſtration, that the ſtrength of the bone becomes augmented, in proportion as its fibres are placed at a greater diſtance from its centre.

With regard to the vaſcular ſtructure of bones, there can be no doubt but that it exactly reſembles that of the reſt of the body. That bones poſſeſs numerous arteries, is proved by the injection of young bones from the general arterious ſyſtem of the ſubject; for they are made very red by the injection conveyed into them by numerous, though minute arteries, which enter them by pores evident on their ſurface. The effect of feeding animals with madder is an additional and ſtriking proof of the ſame fact; for the bone becomes deeply tinged with the red colour of the madder. The cauſe of this phenomenon has of late been explained by Dr. Rutherford: he has ſhewn that it ariſes from a chemical attraction that exiſts between earths and certain colouring materials, which cauſes them to combine ſo intimately as to form pigments which are called lakes by painters. Dr. Rutherford diſſolved madder in diſtilled water, and added to it muriate of lime, which produced no change of appearance in the ſolution; on the further addition of phoſphat of ſoda, a double decompoſition took place; the muriatic acid combined with the ſoda, and the phoſphoric acid with the lime. The phoſphat of lime alſo combined with the madder, and they were together precipitated, forming a beautiful red powder. If blood be conſtantly conveyed into bones by numerous arteries, it muſt be returned from them again by veins, or otherwiſe it muſt accumulate in them in conſiderable quantities. That bones poſſeſs abſorbents in common with other parts is equally clear, and is proved by their mode of growth, and alſo by their diſeaſes. The growth of the tube of a bone is a proof of the mutation of its parts by abſorption; for if bones grew merely by new matter depoſited on the ſurface, the tube of the bone ſhould be of the ſame dimenſions in the adult as in the fœtus: on the contrary, however, the tube enlarges, and bears the ſame proportion to the whole bone in either ſtate. If any number of laminæ of the ſides of a bone, or if a portion of its whole ſubſtance periſh, the mortified part is detached in the ſame manner that it is in ſoft parts; and this detachment is manifeſtly the effect, in the firſt inſtance, of the agency of the abſorbing veſſels. Though a portion of animal ſubſtance has periſhed, it ſtill poſſeſſes the ſame powers of coheſive attraction that it did while living; it ſtill tenaciouſly adheres to the living parts; but a ſpace takes place all round the dead portion, and the production of that ſpace can only rationally be attributed to the removal of parts by the abſorbents. In diſeaſes of bones their form becomes entirely altered, if an increaſed depoſition of matter takes place in their internal parts; and this alteration of form could not happen unleſs the walls were removed by abſorption, and depoſited anew in conformity to the augmented bulk and figure, which the diſeaſed depoſition had occaſioned. Not to cite leſſer inſtances, one may be mentioned, which Mr. Hunter uſed to ſhew in his lectures, of a very large and globular bony tumour, which had formed in the extremity of one of the bones of the leg in an ox. The tumour was ſo ſolid, that the ſection of it admitted of being poliſhed, and the walls of the bone had become thin, and of a ſpherical form, ſo as to make a neat kind of caſe containing this bony tumour. That bones poſſeſs nerves as well as arteries, veins, and abſorbents, cannot be doubted; for though they have naturally but little ſenſibility, they become extremely painful when diſeaſed; and again a fungus ſometimes grows out of a bone, which is ſenſible, though it may have no connection whatever with the ſurrounding ſoft parts; of courſe it muſt have derived its nerves, by means of which it poſſeſſes its ſenſation, from the bone out of which it aroſe. That the veſſels and nerves of a bone are connected together by common cellular ſubſtances, as in other parts of the body, is demonſtrated by ſoaking a bone in dilute muriatic acid, which diſſolves all the lime, and leaves the vaſcular matter a little thickened, but perfectly flexible. We then ſee that this vaſcular and cellular matter has a laminated arrangement correſponding to that of the earthy, which has been deſcribed, ſo that between each layer of earthy matter, there is a layer of ſoft ſubſtance, and of courſe the different layers of ſoft ſubſtance are connected by veſſels and cellular membrane, which intervene between the bony fibres, and connect the different ſtrata together. Bones are covered by a ſtrong, firm, fibrous ſubſtance, termed perioſteum, on which the veſſels are firſt diſtributed; from this they deſcend, connected by cellular ſubſtance, between the fibres of the bone. The veſſels and nerves of the bone enter it through holes which are evident on the ſurface, and which are larger and more numerous in the extremities of the long bones than in the middle. The veſſels do not penetrate the bone in a tranſverſe direction, but obliquely, running tranſverſely through a certain number of lamellæ, and then taking a perpendicular courſe between others, which prevents the bone from being weakened, particularly at any one part, by that want of earthy matter which is neceſſary to leave room for the admiſſion and diſtribution of veſſels.

The marrow that is contained in bones is of an unctuous nature, and in herbaceous animals, hardens when it becomes cold; but it remains fluid in thoſe which are carnivorous. Some of the red parts of the blood are depoſited with it in young animals, but in thoſe that are adult it is no longer tinged with blood. The marrow is contained in fine cells, which do not communicate with one another, like thoſe of the common cellular ſubſtance. This is proved by ſawing a bone through, and keeping it in a temperature which will preſerve the marrow fluid, with the part which is ſawn downwards. Under theſe circumſtances, if the cells communicated, the gravitation of the liquid marrow would cauſe it quickly to drop out, and leave the cells empty; but this does not happen. The cells which contain the marrow are lodged in the cancelli of the bone, at the extremities of the long bones; but in the middle they are unſupported by this kind of oſſeous ſtructure. The cellular ſubſtance which contains the marrow, being condenſed upon the inſide of the walls of the bone, and adhering to them, has been termed the perioſteum internum. In the principal bones we perceive arteries, much larger than thoſe for the nutrition of the bone, which penetrate the walls obliquely, and ſpread their branches upon the medullary cells, for the nouriſhment of theſe parts. That theſe are the chief nutrient arteries of the marrow cannot be doubted; and it has been contended, that they have excluſively this power, and that they do not anaſtomoſe with the nutrient arteries of the bone. This opinion has been formed, becauſe in ſome caſes of accidental injury, in which the medullary artery has been deſtroyed, the marrow has, as it were, periſhed. This opinion, however, ſtands in direct oppoſition to all analogy; and it muſt indeed be conſidered

ſidered as a very ſtrange peculiarity, were not the minute contiguous nutrient arteries to inoſculate with one another. The writer of this article is of opinion, that they do in this, as in other inſtances, for it is common in amputation to cut off the trunks of the medullary arteries, and yet the marrow of the remaining bone does not periſh; and, again, the bone may be injected from the medullary artery alone. We may next inquire into the uſes of the marrow. Havers thought that it tranſuded through the bone, and by this means prevented it from becoming brittle; nay, he even deſcribed the pores through which ſuch tranſudation was ſuppoſed to take place. The cells, however, which contain the marrow are perfect veſicles; and we know that no tranſudation of contained fluids takes place through the membranes which contain them during life, though in conſequence of putrefaction it does after death. If a bone be deprived of its perioſteum in a living body, no tranſudation of oil from its ſurface takes place; and even after death a recent bone may be deprived of its perioſteum, and put in warm water for a conſiderable time, and yet no ſudden tranſudation of oil from the ſurface will take place, as might be expected if there were natural channels for this purpoſe. The canals which Havers deſcribed, are probably the paſſages through which the veſſels are tranſmitted. If then this opinion of the uſe of the marrow be unfounded, we have ſtill to inquire, for what purpoſe is it deſigned? The utility of the bones being formed as they are, ſmall and tubular in their middle, expanded and ſpongy at their extremities, has been already explained. If then ſpaces are neceſſarily left in their interior parts, thoſe ſpaces muſt be filled with ſomething, for they cannot be left void, or the immenſe preſſure of the atmoſphere would cruſh their parietes, and aboliſh the vacuum. There is no matter in the animal body more ſuitable to fill their ſpaces than the marrow; and it is to be regarded as a part of the adipoſe ſyſtem of the animal. In corroboration of this remark, it has been obſerved, that in impoveriſhed and dropſical ſubjects, where there is no fat in other parts, there is likewiſe none even in the bones: and if a bone be ſawn, and the medullary cells broken down, ſo that the fluid which they contain may drop out upon paper, that it will not penetrate it, and render it tranſparent like oil; but, on the contrary, that it will encruſt upon it, from its being of a gelatinous nature, like that fluid which is found in the interſtices of the common reticular or cellular ſubſtance. From the circumſtances which have been detailed in the foregoing account, viz. the great and general vaſcularity of bones;—the quantity of ſoft ſubſtance exiſting in every part of them;—their growth and mutation of form in diſeaſe, &c.;—it is natural to conclude, that there exiſt in the compoſition of every bony fibre, arteries for its formation, abſorbents for its removal, cellular ſubſtance for the connection of its parts, and nerves to give animation to the whole. In this view of the ſubject, we perceive no eſſential difference of ſtructure between bones and other parts of the body; nor do we expect any eſſential difference in the functions of their nutrient, and other veſſels. We naturally conclude that bony fibres are formed and repaired, and that they undergo mutation or removal in the ſame manner, and from the ſame cauſes, that ſoft parts do. Mr. Hunter, however, from obſerving the ſtriated appearance of the bones of animals, who have been at one time fed with madder, and at another with common food, and obſerving that the exterior ſtria was red if the animal was killed after having been for ſome time fed with madder, and white if it had only taken its ordinary food, concluded that bones grew by a depoſition on their ſurface, and a correſpondent removal of the internal part of the walls of the bone. Mr. Hunter alſo, to inveſtigate the truth of Du Hamel's opinion reſpecting the growth of bones, bored two holes in the tibia of a pig, one near the upper end, and the other near the lower; the ſpace between the holes was exactly two inches; a ſmall leaden ſhot was inſerted into each hole: when the bone had been increaſed in its length by the growth of the animal the pig was killed, and the ſpace between the two ſhots was exactly two inches. Mr. Hunter's experiments and opinions are publiſhed by Mr. Home in the ſecond volume of Tranſactions of a Society for the improvement of Medical and Chirurgical Knowledge. We forbear to give a more detailed account of them, or enter into any diſcuſſion of the ſubject, but refer the reader to the original paper, becauſe we believe that no theory will be found, on conſideration, to be adequate to account for the phenomena of the growth and diſeaſes of bones, except that which admits the bony fibres to be of the ſame ſtructure as the ſoft fibres of the body, and conſequently concludes that both are formed, removed, and renovated in the ſame manner. We ſubjoin ſome references to the inſtructive works on the ſtructure of the bones. Albini icones oſſium fœtus, cui accedit oſteogen. brevis hiſtoria.—Annot. Acad. J. G. Walter handbuch von den knochen. Reichel Diſſ. de oſſium ortu & ſtructura in Saudif. theſaur. diſſ. vol. ii. Boehmer inſtitutiones oſteologicæ. Blumenbach Geſchichte und beſchriebung der knochen. The works of Ruyſch. Neſbit's human oſteogeny explained. Kerckring anthropograph. ritrograph. & oſteogenia fœtuum. Du Hamel in memoires de l'acad. des Sciences, 1742. Haller. in op. minor. tom. ii.

Bone, in *Chemiſtry and the Arts*. The analyſis of bone, and the products obtained from it by various chemical proceſſes, deſerve conſiderable attention, as this great claſs of animal ſubſtances ranks among the moſt important to the chemiſt.

So great a ſimilarity is found in the compoſition of the bones of different animals, that their properties may firſt be deſcribed generally.

Bone, when firſt taken from the animal, is moiſt and greaſy on its ſurface; and if cylindrical, it contains a quantity of the peculiar fat called *marrow*. When this is ſeparated, and the bone expoſed to the air, it gradually dries, becomes brittle and whiter; but the articulating heads long remain moiſt, greaſy, and yellow. When once dry, and kept in a dry and airy place, they are ſcarcely ſuſceptible of further ſpontaneous alteration.

The effect of mere heat on bone has long been known to chemiſtry and the arts, as furniſhing ſome very important articles of chemical manufacture. Heated in the open air, bone firſt becomes oily and yellow, gives out a watery vapour, to which ſucceeds a thick, denſe, fetid ſmoke, which readily takes fire, and when once kindled, affords heat enough, when the bones are in ſufficient quantity, to complete the entire calcination, which laſts for many hours, during which they become ſucceſſively black and carbonaceous, brittle, and at laſt, when every thing combuſtible is conſumed, they remain nearly white, friable, light, and extremely porous or cellular in texture, and retaining their original ſhape and bulk. This proceſs of burning bones in the open air, in large heaps, is performed near great towns for the ſake of the earthy ſalt *bone-aſh*, which is left behind, and forms on an average about half the weight of the freſh bone. It is compoſed chiefly of phoſphat of lime, and is uſed by the aſſayers as the material for cupels, and for a few other purpoſes.

But the volatile products which are waſted in the above proceſs, are highly valuable when the bones are diſtilled in cloſe veſſels, without addition as before, but with a proper apparatus to receive and condenſe the volatile products. In theſe circumſtances, with a heat at firſt gentle, but gradually increaſing,

increasing, bone yields, at first, a limpid water, with a peculiar animal oily smell, which soon becomes impregnated with carbonated ammonia, together with an oil, at first of a clear yellow, pungent, and not ungrateful to the smell, but afterwards rendered brown, and even black, by the increasing heat, strongly fetid and ammoniacal. With the empyreumatic oil, a large quantity of sulphurated hydrogen, of carbonated hydrogen, and of carbonic acid gas escapes. The products of this distillation, when condensed, are the ammoniacal water, and the empyreumatic oil; the former contains, besides carbonat of ammonia, a portion of sebacic and prussic acid united with the alkali; the oil may be separated into the less and more empyreumatic, by changing the receiver occasionally, and keeping apart the first portions of the oil as the purest. If this oil is again repeatedly distilled by itself from clean vessels with gentle heat, it becomes at last as colourless as water, pungent, and not very unpleasant to the smell, so volatile at a common temperature as only to be kept by inverting under water the mouths of the vessels that contain it, and acting in medicine as a powerful sudorific. It is called from the name of the inventor, DIPPEL's *Oil*, which see.

The only valuable part of the products of the distillation of bone is the ammonia, or volatile alkali, which is mixed with every part of the distilled liquid, and is afterwards purified by subsequent processes, assisting in the formation of the MURIAT *of ammonia*, or forming the pure CARBONAT *of ammonia* of the shops, the *sal volatile*, *spirit of hartshorn*, &c. When the distillation is discontinued, the bones remain in the retort of a brown colour, and swimming in a black, thick, extremely fetid, tenacious oil. If they are then gradually heated to redness in close iron vessels, every thing volatile is dissipated, and the earthy part remains dry and friable, still retaining the original form of the bones, but thoroughly impregnated with the charcoal of the oil, so as to become a fine glossy black. This is afterwards ground to a fine powder, mixed with size into cakes of a convenient weight, and forms one of the species of *lamp-black*, used very largely as a pigment. The harder and compacter bones, such as ivory, furnish a similar and more valuable black pigment, simply by heating to redness in close vessels.

But the analysis by heat, though it furnishes some valuable articles of commerce, is not well calculated to exhibit the constituent parts of bone in their proper characters.

In fact the ammonia, probably much of the oil, and all the gasses, are formed by the action of heat out of the real constituents of bone, as they exist in the animal.

Water and acids are the chief re-agents to be used by the chemist.

Cold water has scarcely any action on bone, but by long maceration its texture becomes more loose and open, and the gelatinous part becomes gradually changed, as by slow animal putrefaction.

Hot water acts with great ease upon bone, when reduced to small pieces by rasping or bruising; the first effect is to separate most of the *natural* oil of bone which rises to the top, and when cool concretes to a suety fat. The water then dissolves the *gelatin*, which is found to compose a very considerable part of the substance, even of the driest and most compact bone; and in this method a clear insipid pure jelly is extracted, rendering the water, even when in large proportion, of a stiff, tremulous consistence when cooled, which, by evaporation, leaves at last a strong, hard *glue*.

The experiments of M. Pelletier on this subject are important. This accurate practical chemist took six pounds of dry bone shavings, procured from the button-mould makers, macerated them for two days in cold water, and then boiled them for nine hours with 24 quarts of water. The product was a very strong clear jelly, and at the bottom of the vessel the *marc*, or earthy residue, which was pressed in order to separate the portion of somewhat turbid jelly, with which it was entangled. By subsequent boiling down, the jelly became so stiff when cold, as to bear to be cut into firm slices, which were hung up on strings in a place under cover from the weather (as in the common manufacture of glue), and in a fortnight became hard, brittle glue of good quality. The produce was 15½ ounces of clear glue, half an ounce more from the marc, and somewhat foul, and the marc itself weighed 4 lb. 3 oz. The loss in the operation amounted to 13 oz. In like manner 50 lb. of ivory shavings, exhausted by repeated boiling, gave 9½ lb. of clear glue, and 30 lb. of the marc remained.

These facts are important to the manufacturer; nor is the use of bone less interesting as an article capable of supplying much good and wholesome nutriment to man and other animals. In the making of soups it is a matter of common observation, that bones contribute, when boiled with the meat, to the richness of the liquor; but it is not commonly known how much they may be made to add to the nutritious quality; nor is it generally known that the hardest and driest bones, even those that have been kept for years, retain their gelatinous part unchanged.

The exact proportion of jelly cannot easily be ascertained by extraction with water, for even when converted into the hardest glue, it has become intimately united with a portion of this fluid; and it is by no means certain that the utmost desiccation of glue equals the degree of dryness of natural gelatin, as it exists in the more solid bones.

The quantity of jelly is also much increased, either by giving the water by which it is extracted a higher heat than the boiling point, or by reducing the bones to a fine powder, and using repeated coction and pulverization.

The former method was used by Papin, who, in his valuable experiments on the solubility of animal substances, when confined with highly heated water in his *Digester*, found that he was able to extract every thing from powdered bone, but the mere earthy part. The latter mode has been brought into notice by M. Proust, in an important economico-chemical memoir on the "Method of ameliorating the subsistence of the Soldier," published at Madrid, in 1791.

Though there is a great general similarity between the bones taken from different parts of the body, they differ much in the relative portion of fat, of gelatin, and of earth. The younger the animal is, the less earthy salt, *cæteris paribus*, is contained in its bones. The large, round, joint-heads of the thigh, and other large bones, contain much more oil than the rib or blade bones, as is seen when they are exposed to the air; the latter soon becoming dry and clean, but the former remaining long foul and greasy.

No method of extracting all the soluble part of bone answers the purpose so completely, as long boiling in Papin's digester with a very great heat; the earthy residue then remains quite friable in the fingers, and gives little, if any, volatile, oily, or ammoniacal product on burning. But the jelly which remains in the water, and the oil which swims at the top, are found to have acquired a burnt unpleasant taste; and in the process, a considerable quantity of gas is generated, doubtless from partial decomposition of the soluble part. On the other hand, even after repeated boiling and laborious pulverization, unassisted by a higher heat than that of boiling water, the earthy residue still feels clammy and cohesive between the fingers, and retains some of the oil.

M. Proust asserts, that the knuckle and joint bones simply chopped into small pieces, and boiled for a quarter of an hour in a common copper, yielded no less than one fourth of their weight of fine insipid fat, which rose to the top of

the water, and on cooling concreted into the consistence of suet. The haunch bones yielded about one eighth of fat. The utmost economy of bones, therefore, when used as human food, may be obtained in the following method. First chop the fresh bones into small pieces, and extract the fat in the way just mentioned; then dry the bones, and powder, or reduce them to a fine paste, by some pretty strong mechanical power; and boil them with about ten times their weight of water, for some hours, till half the water is wasted, more or less according to the kind of bone; the joint and thick bones making a richer jelly than the thin bones, and therefore requiring somewhat less boiling down to make a jelly of a determinate consistence.

M. Proust finds that this proportion of water is sufficient to leave a jelly of about the same richness as would be produced by dissolving one ounce of bone jelly, dried to the consistence of portable soup, in thirty-one ounces of water, and makes a jelly of a very agreeable degree of richness. The extraction is much assisted by using an iron vessel with a close lid, to give a heat somewhat greater than that of boiling water, though not to the degree of a Papin's digester.

In all the above experiments on the extraction of jelly and fat from bones, the uncooked bone is understood to be used. The bones of *boiled* meat, though deprived of some of their extractive matter, are still rich in nutriment; but *roasting* renders them entirely unfit for this purpose.

The earthy part, which composes on an average about half the weight of the larger bones of animals, was discovered first by Gahn, a Swedish chemist, to consist of the phosphoric acid united with a large proportion of lime. It will be more minutely described under the article PHOSPHAT *of Lime*; and it is the most convenient substance from which PHOSPHORUS is prepared. It may here be mentioned, that the stronger acids, such as the sulphuric or nitric separate a part of the lime from this earthy salt, but only a part, for when sulphuric acid is added to bone ash, sulphat of lime is formed in great quantity, most of which remains at the bottom of a supernatant liquor, consisting of a great excess of phosphoric acid united with a small portion of lime, and also some sulphat of lime dissolved therein. It should be remarked in the analysis of this salt, that this acid phosphat of lime, is not decomposed by any single acid, nor even by the pure or carbonated alkalies; for, on adding the latter, the precipitate is not carbonated lime, but still the phosphat.

This earthy salt, when in solution, is, however, entirely decomposed by the nitrat or acetite of lead; the lime remaining dissolved in the liquor by the nitric or acetic acid, and the phosphat of lead forming an insoluble precipitate. Phosphat of lead is distinguishable from sulphat of the same metal by being readily soluble in nitric acid. If the phosphat is sprinkled on hot charcoal, the lead is reduced, and the luminousness and peculiar smell of phosphorus are perceivable. The phosphat of lime is equally distinguishable from the sulphat of lime by being very soluble in most acids, even when dilute.

Much light has been thrown on the analysis, and with it the physical structure of bone, and of most other of the hard supporting or protecting parts of the body, by the accurate and numerous experiments of Mr. Hatchett, whose researches into these subjects are admirably calculated to shew the extreme advantage which physiology derives from the labours of the chemist, when assisted by accurate knowledge, and guided by a philosophical spirit.

When bones, boiled or fresh, are steeped in any acid, a slight effervescence is perceived, and they presently are rendered soft and flexible by the gradual abstraction of the earthy basis (chiefly phosphat of lime), which becomes dissolved in the acid. If the bone be previously boiled for a long time in water, its gelatin is removed by this liquid; but if the bone is in its natural state, the gelatin also is gradually dissolved in the acid, rendering it yellow and somewhat tenacious. The insoluble residue (except in a few kinds of bone, such as the enamel of the teeth) is either a membrane or a spongy cartilage, retaining the form of the original bone; for, in the process of ossification, membrane or cartilage forms the first basis or rudiments of bone, which is afterwards compleated by the gradual deposition of the earthy salts. Though phosphat of lime forms the chief ingredient in the earth of bones of all animals, a small portion of sulphat of lime is mixed with it: and Mr. Hatchett has detected also a little carbonate of lime. The carbonic acid of this is that which occasions the slight effervescence during the action of the acid; the lime remains dissolved in the acid after the precipitation of the phosphat of lime by pure ammonia. A carbonated alkali then precipitates it together with the now decomposed earth of the calcareous sulphat.

We have thus shewn the great constituent parts of bone to be *gelatin*, soluble by boiling in water, and giving a fine clear jelly; *oil*, separable, during the boiling, by rising to the top of the water, and when cold concreting into a suet; *phosphat of lime*, soluble in dilute nitrous muriatic or acetous acid, and precipitable thence by pure ammonia; some *sulphat of lime*; a little *carbonate of lime*; and a *membranous* or *cartilaginous* substance, retaining the form of the bone after every thing else has been extracted by water and an acid.

For a highly probable opinion on the nature and origin of this membrane or cartilage, we are indebted to Mr. Hatchett who has shewn a number of characteristic marks, in which it most strongly resembles inspissated albumen, and by which it differs from gelatin. The chief of these are the following:

When dry, it is semi-transparent like horn, and more or less brittle. In this state it resists the action of water very powerfully; for when boiled for many days with this fluid, a scarcely perceptible precipitate is given by nitro-muriat of tin; a test of dissolved albumen. In this it strikingly resembles coagulated albumen, and as pointedly differs from gelatin, which, as we have seen, is readily extracted by water even from the dryest and hardest bones.

This bony membrane, as well as albumen, is scarcely acted on by cold muriatic and sulphuric and dilute nitric acids, which last readily extracts gelatin from bone. However, after an immersion in these acids of some weeks, the bony cartilage, when taken out and steeped in ammonia, gradually dissolves into a blood-red liquor. But if the nitric acid is heated, the albuminous membrane is rapidly dissolved with the copious discharge of nitrous gas.

With caustic fixed alkali, the bony membrane or cartilage is readily dissolved into a perfect animal soap (a strong mark of resemblance to albumen, and difference from gelatin), and during the process much ammonia is given out. Acids again separate the albumen from the soap, unaltered in chemical properties.

Lastly, the bony cartilage is extremely slow to enter into a state of putrefaction, though kept moist and warm for many weeks: and in this too it resembles coagulated albumen.

Therefore in addition to the above-mentioned constituent parts of bone, we may add *albumen*, in a condensed state, forming the substance of the original cartilaginous or membranous structure, both of all the organized bones, and, as Mr. Hatchett has also shewn, of most of the hard parts which serve for the covering, protection, and arming of

almost

almoſt every part of the animal creation. See the articles Shell, Horn, &c.

The enamel of the tooth is a ſingular variety of the bone, being entirely deſtitute of the albuminous membrane. When an entire tooth is immerſed in dilute nitrous acid, the enamel totally diſſolves without reſidue; but the core of the tooth is acted on like other bone, leaving a cartilage of the ſame ſhape. The ſolution of enamel is found to be almoſt entirely phoſphat of lime, by the teſts already mentioned, being precipitable by pure ammonia, giving phoſphat of lead, by adding the acetite of this metal, &c.

Fiſh-bones Mr. Hatchett found to contain rather a larger quantity of cartilage, in proportion to the phoſphat of lime, than the bones of quadrupeds. Of the different kinds of horn and defenſive weapons, the ſtag's-horn, elephant's-tuſks, and the other hard and heavy defences, entirely reſemble bone; but the horns of cattle, rams, and the ſofter ſpecies, contain ſo little earthy reſidue, that they owe their ſolidity entirely to the extreme condenſation of the other conſtituents, the gelatin and albumen.

Bones may be ſoftened by a ſhort immerſion in a weak acid. This ariſes from the partial abſtraction of the earthy baſis; and advantage may be taken of this property in the working of bone, for the various purpoſes of manufacture to which this article is applied by the turner, comb-maker, cutler, &c. Bone thus ſoftened, is again made hard, by being ſteeped in alum-water. Alkalies alſo ſoften bone, as they do every other animal matter, by beginning to act upon the ſofter parts. See Ivory.

Bones readily take various colours, which, if diſſolved in an acid, ſink deep into the ſubſtance of the bone, and produce a pleaſing effect. The metallic ſolutions are generally preferred for this purpoſe. To give a green, diſſolve verdigris in diſtilled vinegar, immerſe the bones in the ſolution, put the whole in a veſſel, very well cloſed, and bury it in a dunghill, or give it a ſlow and uniform warmth in any other way for about ten or twelve days. The bones are then found very deeply and permanently dyed green, and capable of a good poliſh. The once prized *Turquoiſe* ſtone is foſſile bone of various animals, accidentally impregnated with ſulphat of copper whilſt buried in the earth. To give the artificially dyed bones a finer colour, boil them in nut-oil, and they will then take a very high poliſh.

A permanent black is given to bone, either by nitrated ſilver, or in the following manner: boil equal parts of litharge and quick-lime in water, and the bones along with them for ſome hours, ſtirring them frequently. Other metallic ſolutions may be uſed for different colours.

Or the dye may be given by preparing the vegetable coloured lakes, or concentrated dyes; and by rubbing the bone, firſt with dilute nitrous acid to open its texture, and then rubbing in the dye for ſome time. This may be applied in various ways, firſt ſoftening the bone by a weak acid, whereby it is made fit to receive the colour.

Bones are whitened by ſimple expoſure to ſun, wind, and weather, being firſt thoroughly cleaned, and particularly by occaſional immerſion in brine: thus the bones of ſea-birds and fiſh, left for ſome time on the ſhore, are found beautifully white and clean. The ſame effect is produced much more ſpeedily, but perhaps leſs permanently, by the oxymuriatic acid, the bone being expoſed for ſome hours to this acid gas in cloſe veſſels, as Mr. Smith of Briſtol has obſerved. The acid firſt makes the bone yellow, which, by expoſure to air goes off, and leaves the bone beautifully white. This colour a little fades, when the bone is kept in cloſe caſes excluded from the light. See Skeleton.

From all that has preceded, it will appear obvious that to the chemiſt and manufacturer, bone is one of the moſt curious and valuable of the animal ſubſtances, though conſidered vulgarly as little better than refuſe, and ſcattered about without care. Beſides its uſe as a hard and good material for turnery and workmanſhip of various kinds, it gives, by chemical decompoſition, a large quantity of uſeful, nutritive jelly, fit for human food, or the ſame, in the form of glue, for the arts. When ſubjected to fire, it yields a vaſt quantity of ammonia, and is actually the material uſed in very many manufactures of the ammoniacal ſalts; and the reſidue, ſtrongly calcined in cloſe veſſels, (and therefore retaining its carbonaceous ingredient,) produces uſeful and fine black pigments; or, burned with acceſs of air, leaves an earthy ſalt, neceſſary to ſome important chemical proceſſes.

Some of the preparations from bone are only uſed in medicine. Of theſe, are Dippel's oil, and the leſs rectified *oleum cornu cervi*, (oil of hartſhorn,) both powerful ſudorifics, and ſuppoſed antiſpaſmodics; the *ſpiritus cornu cervi*, (ſpirits of hartſhorn,) ſo univerſally known as a ſtimulant and cordial; and the carbonat of ammonia, often called ſalt of hartſhorn. The white calcined earth of bones, *cornu cervi calcinatum*, enters into the compoſition of one or two pharmaceutical preparations, but without exhibiting any obvious properties. In diſeaſes of the bones, where the ſoftening and ſpontaneous deformity ſhews an evident want of their earthy baſis, this calcareous phoſphat has been given with apparent advantage. Of the unprepared bones, the elk's tooth, rhinoceros's horn, and ſhavings of the dried human ſkull, &c. are medicines entirely exploded only within a few years from the European pharmacopæias, and ſtill maintaining high credit in the countries whoſe characteriſtic credulity and ſuperſtition in medicine firſt brought them into repute. The only real utility of unprepared bone in medicines is found in furniſhing, when boiled in water, a light and nutritive jelly for the invalid; and for this purpoſe, hartſhorn ſhavings are employed with advantage. Memoirs de Pelletier, tom. ii. Prouſt in the Journal de Phyſique, tom. liii. Hatchett in the Phil. Tranſ. for 1799 and 1800. Smith in Beddoes's Weſt of England Contributions. Johnſon's Animal Chemiſtry. Encycl. Method. Arts and Metiers, (Article *Ecaille*), &c. &c.

Bones, *Diſeaſes of the*, in *Surgery*. As bones are organized parts of the animal body, they are liable to moſt of the diſeaſes with which the ſofter organs are affected. Theſe are either ſpontaneous, or accidental; but, from the hardneſs of their compoſition, and the ſmall degree of vaſcularity and ſenſibility they poſſeſs, there muſt neceſſarily be a conſiderable difference between the phenomena and ſymptoms of diſeaſed bones, compared with thoſe of the ſoft parts. They are naturally endowed with little or no ſenſation; but are extremely painful in an inflamed ſtate, when the blood-veſſels, which enter their ſubſtance, are diſtended, and the nervous filaments are kept upon the ſtretch, as in the caſe of venereal nodes, &c.

Bones may be wounded with a ſharp inſtrument, or contuſed with a blunt one, in the ſame manner as the muſcles, or integuments; and they will re-unite again, if the injury they ſuffer be not ſo extenſive as to intercept the circulation, or deſtroy their vitality. But, if a bone be ſo injured as to periſh, its ſubſtance will either be gradually comminuted and diſſolved, or caſt off in a larger portion, by the proceſs we denominate *exfoliation*. If any two ulcerated ſurfaces of fleſh (ſuppoſe two contiguous fingers) be applied together, and allowed to heal, they will coaleſce, and the veſſels from one part will ſhoot into the other: in like manner, if the articulating ſurfaces of two contiguous bones (ſuppoſe

(ſuppoſe of the tibia and femur), be diveſted of their cartilage by ulceration, their extremities may coaleſce, and form one continuous bone, which is named *anchyloſis*. A ſtiff joint, from this cauſe, is irremediable, and in general it may be conſidered as the moſt favourable termination of diſeaſed joints; for they too commonly are attended with ſuch diſtreſſing ſymptoms as to require amputation, in order to preſerve the patient's life. See WHITE SWELLING, and *Diſeaſes of the* JOINTS.

The conſideration of *Fractures* and *Diſlocations* is reſerved for their proper places in the Cyclopædia, where will be likewiſe deſcribed the manner of reducing bones, vulgarly called *bone-ſetting*. This art, (which requires a very correct acquaintance with the anatomy of the joints and muſcles), has, moſt unaccountably, been often left to ignorant farriers and mechanics, who are totally deſtitute of knowledge on theſe ſubjects! We might, with as much reaſon, entruſt the repairing of a watch, or a mill, to perſons who never had an opportunity of examining their mechaniſm! By accident, it is barely poſſible, ſome good might be done; but the greater chance is, that the inſtrument would be damaged rather than rectified, in the hands of ſuch unſkilful operators.

Bones will, in ricketty and ſcrofulous conſtitutions, paſs into a ſtate of ſpontaneous enlargement, or decay, or flexibility, &c. The ſpongy parts of bones, e. g. the extremities of cylindrical bones, are moſt liable to become diſeaſed in ſuch ſubjects, eſpecially during the early period of life; but in venereal patients, who are alſo very ſuſceptible of morbid changes in the bones, they are their hard parts chiefly which become affected, as in the middle of the tibia, or ulna, or upon the central portions of the frontal and parietal bones. See RICKETS, SCROFULA, and LUES VENEREA. Some obſervations on the ſurgical treatment of diſeaſed bones will be alſo made under the heads of CARIES, NECROSIS, SPINA BIFIDA, DISTORTION, CURVATURE, MOLLITIES, and EXOSTOSIS.

The ſtructure of bones may be altered from ſeveral cauſes; but principally, from either a deficiency, or a redundancy of the phoſphat of lime, which enters into their compoſition, and gives them ſolidity. When there is too little phoſphat of lime, the gelatinous parts of the bones being unable to ſuſtain much weight or reſiſtance, they will become preternaturally flexible; and, on the contrary, when there is too much phoſphat of lime, in proportion to the gelatinous part, the bones will be very fragile, and perhaps, may even break from the mere action of the muſcles. The flexible ſtate is moſt common in young perſons, and the ſuperabundance of oſſeous matter is chiefly predominant in old age; but either condition of the bones may occur at any period of life, from peculiar morbid diſpoſitions. The popular notion of our bones being more frangible in cold weather than in hot, is erroneous, and without foundation; ſince the difference of ſeaſon makes no difference in the texture of the living bones: and the only natural cauſe to be aſſigned for the fracture of our limbs more frequently in the winter that in the ſummer, is that of an increaſed ſlipperineſs and hardneſs in the ground from froſt, &c. which muſt neceſſarily occaſion more phyſical violence and frequency in our falls.

BONES, *in the funeral ſolemnities of the ancients.*—Divers uſages and ceremonies relating to the bones of the dead, have obtained in different ages; as gathering them from the funeral pile, waſhing, anointing, and depoſiting them in urns, and thence into tombs; tranſlating them, which was not to be done without the authority of the pontiffs; not to ſay worſhipping them, ſtill practiſed to the bones of the ſaints in the Romiſh church. Among the ancients, the bones of travellers, and ſoldiers dying in foreign countries, were brought home to be buried, till, by an expreſs S. C. made during the Italic war it was forbid, and the ſoldiers' bones ordered to be buried where they died; the reaſon was, leſt the melancholy ſight ſhould diſcourage the people from venturing their lives. Antiquaries are divided as to the manner of diſtinguiſhing the bones of the deceaſed, from thoſe of the beaſts and ſlaves, who were ſacrificed at his funeral, and thrown into the ſame fire: probably it was done by diſpoſing the body of the dead in the middle of the pile, and the others towards the ſides. Potter's Archæol. tom. ii. lib. iv. cap. 6.

The Romans had a peculiar deity, under the denomination of *Oſſilago*, to whom the care of the induration and knitting of the human bones was committed: and who, on that account, was the object of the adoration of all breeding women. Pitiſc. Ant. tom. ii. p. 341.

BONES, *foſſile*, or *petrified*, are thoſe found in the earth, frequently at great depths in all the ſtrata, even in the bodies of ſtones and rocks.

There are divers ſorts of foſſile bone; ſome of a huge ſize, uſually ſuppoſed to be the bones of giants, but more truly of elephants or hippopotami; others ſmaller, as vertebræ, teeth, and the like.

It has been diſputed whether theſe be really animal ſubſtances, or mineral, that is, ſtones thus figured. Modern naturaliſts generally allow them to be animal, not merely on account of their figure and reſemblance, but of their chemical principles, which are found to be wholly of the animal kind. It is ſuppoſed they were repoſited in thoſe ſtrata at a time when all things were in a ſtate of ſolution, and that they incorporated and petrified with the bodies where they happened to be lodged.

In the Philoſophical Tranſactions (vol. lxxxiv. p. 407, &c.) we have ſome obſervations on foſſile bones by the late Mr. John Hunter. They were occaſioned by an examination of bones of this kind, found in the caves of Gailenreauth and Klauſſtein, two ſmall villages in the principality of Bayreuth, (or Bareith), and preſented to the Royal Society by the margrave of Anſpach. Theſe bones are conſidered more as incruſted bodies than extraneous foſſils, ſince their external ſurface has only acquired a covering of cryſtallized earth with little or no change in their internal ſtructure. The principal earth with which bones are moſt commonly incruſted is the calcareous; and this happens either by the bones being immerſed in water, in which this earth is ſuſpended, or by water's paſſing through maſſes of this earth, which it diſſolves, and afterwards depoſits upon bones which lie underneath. Bones which are incruſted ſeem never to undergo this change in the earth, or under the water, where the ſoft parts were deſtroyed; while bones that are foſſilized become ſo in the medium, in which they were depoſited at the animal's death. The incruſted bones have been previouſly expoſed to the air; which is evidently the caſe with theſe bones, and alſo with thoſe of the rock at Gibraltar, thoſe found in Dalmatia, and thoſe of the iſland of Cerigo. They are thus diſtinguiſhed from foſſilized bones: but as they are found in different ſituations, it is more difficult to account for their preſent ſtate. Thoſe in Germany are found in caves; the coaſt of Dalmatia is ſaid to be wholly formed of them; and this is the caſe with a large portion of the rock of Gibraltar. With reſpect to the firſt claſs of bones, as they are thoſe of carnivorous animals, reſembling, in ſome reſpects, thoſe of the white bear, and yet differing, in ſome circumſtances, from the preſent animal of that ſpecies, Mr. Hunter ſuggeſts, that the animals to which they

they belong resorted at different periods to these caves, as places of retreat, and perished in them. In Gibraltar, they are mostly the bones of animals of the ruminating tribe, of the hare kind, and of birds, with some of a small dog, or fox, and likewise shells. Those in Dalmatia appear to be mostly of the ruminating tribe. From these facts, it may be presumed, that their accumulation did not arise from any instinctive mode of living, as the same mode could not suit both carnivorous and herbivorous animals. As to the local distribution of these bones, it is necessary to recur to successive shiftings of the situation of the sea, in consequence of which we may have a stratum of marine extraneous fossils, one of earth, mixed probably with vegetables and bones of land animals, a stratum of terrestrial extraneous fossils, then one of marine productions; but as the sea carries its inhabitants along with it, wherever there are those of land animals, there will also be a mixture of marine ones; and from the sea commonly remaining thousands of years nearly in the same situation, we have marine fossils unmixed with any others. As all operations respecting the decomposition, as well as the growth, of animal and vegetable substances, proceed more rapidly on the surface of the earth, to which the air has access, than within it, we shall find fewer changes as we descend into the earth, and at last probably arrive at a certain depth, where no change takes place. Substances, therefore, that are fossilized at a great depth, and deposited in stone, clay, &c. are preserved for a very long time from putrefaction; as much so as if they were in a vacuum; the heat also in such situations being uniform, commonly about 52° or 53°; and in the colder regions they are still longer preserved. It has been generally understood, that in extraneous fossils the animal part is destroyed: but Mr. Hunter has not found this to be the case. Shells, and bones of fish, must probably have the least in quantity, having been longest in that state, otherwise they should have the most; for the harder and the more compact the earth, the better is the animal part preserved; and this is an argument in proof of their having been longest in a fossil state. In the fossil bones of sea-animals, as the vertebræ of the whale, the animal part is in large quantity, and exists in two states; the one having some tenacity, but the other like wet dust; in some of the harder bones it is more firm. In the fossil bones of land animals, and those which inhabit the waters, as the sea-horse, otter, crocodile, and turtle, the animal part is in great quantity. In the horns of stags dug up in Great Britain and Ireland, when the earth is dissolved, the animal part is in considerable quantity, and very firm. The same observations apply to the fossil bones of the elephant found in England, Siberia, and other parts of the globe; also those of the ox kind; and more particularly to their teeth, especially those from the lakes in America, in which the animal part has suffered very little: the inhabitants finding little difference in the ivory of such tusks from the recent, except its having a yellow stain; the cold may probably assist in their preservation. In incrusted bones, the quantity of animal substance is very different in different bones: in those of Gibraltar, there is very little; it partly retains its tenacity, and is transparent, but the superficial part dissolves into mucus. Those from Dalmatia furnish similar results. Those from Germany, especially the harder bones and teeth, seem to contain all the animal substance natural to them, though in this respect they differ among themselves. The bones of land animals have their calcareous earth united with the phosphoric acid of the aerial, and retain it, when fossilized, as Mr. Hunter thinks, in proportion to the quantity of animal matter they contain. This he infers from the quantity of effervescence. In some bones of the whale, put into the muriatic acid, the effervescence is very great; in the Dalmatia and Gibraltar bones it is less; and in those of the German caves, it is very little, since they contain by much the largest proportion of animal substance. From the experiments and observation of the ingenious Mr. Hatchett, (see Phil. Trans. vol. lxxxix. p. 333.) we learn that the bones of the Gibraltar rock consist principally of phosphat of lime; and that the cavities have been partly filled by the carbonate of lime, which cements them together. Fossil bones, he says, resemble bones which, by combustion, have been deprived of their cartilaginous part; for they retain the figure of the original bone, without being bone in reality, as one of the most essential parts has been taken away. Such fossil, or burned bones, can no more be regarded as bone, than charcoal can be considered as the vegetable of which it retains the figure and fibrous texture. Bones which keep their figure after combustion, resemble charcoal made from vegetables replete with fibre; and cartilaginous bones, which lose their shape by the same cause, may be compared to succulent plants which are reduced in bulk and shape in a similar manner. Hence he is led to question if bodies, consisting of phosphat of lime, like bones, have concurred materially, to form strata of limestone, or chalk; as it appears to be improbable, that phosphat is converted into carbonat of lime, after these bodies have become extraneous fossils. The destruction, or decomposition of the cartilaginous parts of teeth and bones in a fossile state, must have been the work of a very long period of time, unless accelerated by the action of some mineral principle; for, after having, in the usual manner, steeped in muriatic acid the os humeri of a man, brought from Hythe in Kent, and said to have been taken from a Saxon tomb, Mr. Hatchett found the remaining cartilage nearly as complete as that of a recent bone.

M. Cuvier communicated to the Societé d' Histoire Naturelle at Paris, a curious memoir upon the fossil bones of animals. The following abridgment has been taken from the Societé Philomatique, N° 18. Year VI. In order to determine the relations and differences that subsist between the several species of animals that do exist, or have existed on the surface of the globe he directed his attention to the following. 1. The animal which afforded the bones and teeth, called the bones and horns of the mammouth, by the Russians and Siberians, and of which remains are found in Europe, is a species of elephant, resembling the elephant of Asia; but differing from it in the alveolæ of its teeth, its tusks being longer, the angle of its lower jaw more obtuse, and the laminæ of which its grinders are composed thinner. The true analogous living animal is not known, though it has been hitherto considered as the ordinary elephant. 2. The animal, of which the remains are found on the banks of the Ohio in North America, which the Americans and English have also named mammouth, though it differs much from the former. Remains of it are found in Europe and Asia. It must have been nearly as high as the elephant, but more bulky; its tusks are smaller; its grinders are armed with large cutting points, of which the section by wear presents double transversal lozenges. There are three molar teeth on each side, one of four, one having six, and one eight points. 3. The animal of which the teeth tinged by copper afford the turquois stone, and of which there was a mine at Simore, in Languedoc. The remains of this species are found in the department of Ain, in Peru, and elsewhere. It must have considerably resembled the former; but the points of its molar teeth are round, and when worn, their section presents first, a circle, then a semi-oval, and afterwards a figure of a trefoil, which has caused them to be confounded with the teeth of the rhinoceros; some

ſome of theſe teeth have 12 points, others 6, others 4. 4. The rhinoceros. The feet and fragments of the jaws of this animal are found in France, and elſewhere, in which the author has hitherto obſerved nothing which differs from the common rhinoceros; but, as he has not yet ſeen an entire bone, he cannot poſitively affirm that they are identical. 5. The ſpecies of rhinoceros, with an oblong cranium, which is found in Siberia, Germany, and other countries. The author has ſeen teeth, and parts of the jaw-bones, found in France, which appeared to him likewiſe to belong to this animal; the principal character of this ſpecies conſiſts in the long cloſure of the noſe: the living analogous animal is unknown. 6. A molar tooth with two tranſverſal eminences, which is in the poſſeſſion of Citizen Gillet; and of which the National Muſeum poſſeſſes a young tooth that reſembles neither the teeth nor the germs of any animal yet known, whether living or foſſil: the only tooth which this ſlightly reſembles is the laſt molar tooth of the rhinoceros. This tooth, therefore, indicates the exiſtence of a ſixth foſſil ſpecies, of which the living analogous animal is unknown. 7. The animal twelve feet in length, and ſix in height, of which the ſkeleton was found under ground at Paraguay, and is preſerved in the royal cabinet of Spain, at Madrid. The author proves by a detailed compariſon of the bones, with thoſe of all the known quadrupeds, that it is a proper and diſtinct ſpecies, more nearly approaching the ſloth than any other genus, and that it may be called the giant ſloth. Citizen Cuvier, in this place, communicates the intereſting diſcovery he has made, that the ſloth (*bradypus tridactylus*, Lin.) has naturally and conſtantly nine cervical vertebræ. It is the firſt known exception eſtabliſhed by Citizen Daubenton, that all quadrupeds have neither more nor leſs than ſeven cervical vertebræ. 8. The animal, of which the remains are found in the caverns near Gaylenreuth and Muggendorf, in the margraviate of Bayreuth, in Franconia. Various authors have conſidered it as a white bear; but it differs from this animal, as well as from all the known bears, in the form of its head, which is particularly characterized by the projection of the front, by the abſence of the ſmall tooth, which all the known bears have behind each canine tooth, by the oſſeous channel of the humerus, in which the brachial artery paſſes, and by ſeveral other circumſtances in the figure and proportion of the bones. This animal, however, reſembles the bear more particularly than any other kind. 9. The carnivorous animal of which the bones are found in the plaiſter-ſtone of Montemartre: the form of its jaws, the number of its molar teeth, and the points with which they are armed, indicate that this ſpecies is referable to the genus canis; but it does not completely reſemble any ſpecies of this genus. The moſt ſtriking diſtinctive mark is, that the ſeventh molar tooth is the greateſt in the animal of Montemartre, whereas the fifth is the largeſt in dogs, wolves, foxes, &c. 10. The animal of which the lower jaw was found near Verona, has been conſidered by Joſeph Monti as a portion of the cranium of the ſea-cow; a notion which all the geologiſts have adopted, though it be contrary to the moſt ſimple notions of comparative anatomy. This jaw, according to Cuvier, has belonged to an animal reſembling, though ſpecifically different from, the mammouth, the animal of the Ohio, and that of Simore. Its moſt particular character conſiſts in the curve which forms its ſymphyſis. 11. The animal of the ſtag kind of which the bones and the antlers are found in Ireland, in England, at Maeſtricht, &c. It is ſufficiently different from all the ſtags, and even the elk, to which it has been referred, by the enormous magnitude of its antlers, the flattening of their ſuperior part, and the branches which ſpring from their baſe. Several figures of theſe are given in the Philoſophical Tranſactions. 12. The genus of the ox or beeve alone affords ſeveral foſſil ſpecies: the craniums of two were found in Siberia, which have been deſcribed by Pallas, who referred one of them to the ordinary buffalo; but he has ſince attributed them to a peculiar ſpecies, natives of Thibet, named arni. Citizen Cuvier proves, by oſteologic compariſon, that thoſe craniums have not belonged to the buffalo. The other appeared to Pallas to have belonged to the buffalo of the Cape, or the muſk ox of Canada. Citizen Cuvier ſhews that they cannot have belonged to the former; but not being in poſſeſſion of the cranium of the arni, nor the muſk ox, he makes no deciſion reſpecting their identity with the foſſil craniums.

The author likewiſe deſcribes two kinds of craniums which have been found in the turf-pits of the department of La Somme, which greatly reſemble our common ox, and that of L'Aurouchs, but are more than one fourth longer.

From this inquiry the Citizen Cuvier concludes, 1. That it is not true to affirm that the animals of the ſouth have formerly lived in the north, their ſpecies not being perfectly identical. 2. That in every country there have lived animals which do not at preſent exiſt, either on the ſame ſpot, or elſewhere in any known country. Hence he leaves to geologiſts, the taſk of making, in their ſyſtems, ſuch changes or additions as they may think beſt ſuited to explain the facts which he has thus eſtabliſhed.

Bone is alſo applied abuſively in ſpeaking of other matters which bear ſome analogy, either in reſpect of ſtructure or office, to the bones of animals.

In this ſenſe rocks are ſometimes called the bones of the earth. Divers ſpecies of figured ſtones, as the *cephalites*, *cardites* &c. are denominated mineral bones, cnoſta, oſteocolla, &c. Some naturaliſts conſider ſhells as a ſpecies of bones. The lobſter, according to Fontenelle, is an animal which carries its bones on its outſide.

Bones, *Giants*. See Giants *bones*.

Bones, *Mammouth*. See Mammouth.

Bone-*fire*. See *Bon*-Fire.

Bone-*lace*. See Lace.

Bone, *hurle*, *Neper's*, *quitter*, *ring*, *whale*. See the ſeveral articles.

BONEF, in *Geography*, a town and abbey of the Netherlands, in the county of Namur, 3 leagues north of Namur.

BONENCONTRE, a town of France in the department of the Coté d'Or, and chief place of a canton, 5 miles S.W. of St. Jean.

BONETTA *Shoal*, lies about N.E. by E. from Bonaviſta iſland, one of the Cape de Verd iſlands, diſtant from it about 12 or 14 leagues.

BONEZIDA, a town of Tranſilvania, on the Samos, 12 miles N. of Clauſenburg.

BONFADIO, James, in *Biography*, an eminent Italian ſcholar of the 16th century, was born at Gorzano, in the Breſcian territory, and ſtudied in the univerſity of Padua. From thence he went to Rome, where, for ſome time, he ſerved the cardinals Merino and Ghinucci, as ſecretary; and after wandering from place to place, he reſumed his ſtudies at Padua, where he was probably employed in the inſtruction of youth. Deriving from none of his employments more than a precarious ſubſiſtence, he was, in 1545, invited to the chair of philoſophy, in the city of Genoa, to which was united the office of hiſtoriographer, with a conſiderable penſion. Whilſt he was buſily proſecuting his ſtudies, he was charged and convicted of an unnatural crime; beheaded in priſon; and his body was publicly burnt in July 1550. As a writer in the Latin and Italian languages, both in proſe and verſe, he

he excelled; and his tranſlation of Cicero's oration for Milo, is reckoned one of the moſt elegant pieces of Italian proſe which the century affords. His capital work is the "Annals of the republic of Genoa," written in Latin, and compriſing the hiſtory from 1528, where Giuſtiniani left off, to February 1550. It was firſt publiſhed at Padua, in 1586, 4to. and tranſlated into Italian by Paſchetti. The ſtyle is elegantly ſimple, the narrative lively, and the ſentiments elevated. His Italian letters and poems were printed at Breſcia in 1746—47. Gen. Dict. Nouv. Dict. Hiſt.

BONFATTI, in *Geography*, a town of Italy, in the kingdom of Naples, and province of Calabria citra, 3 leagues W. of St. Marco.

BONFINI, Anthony, in *Biography*, was born at Aſcoli, and after being ſome years profeſſor of belles-lettres, at Recanati, was invited by Matthias Corvinus king of Hungary, in 1484, to his court, where he was employed in writing the hiſtory of the Huns. Here he enjoyed the office of tutor to the queen, Beatrice of Arragon, and received many honours from Matthias, and his ſucceſſor Ladiſlaus. He died in 1502, aged 75. Of the hiſtory of Hungary he left 4½ decads, brought down to 1495; of which 3, or 30 books were printed, by Martin Brenner, in 1543, and the remaining 15 books were added to a new edition by Sambucus, in 1568. This work is written with elegance, and is claſſed among the beſt modern hiſtories in Latin. He alſo wrote an account of the capture of Belgrade by Mahomet II.; and a work entitled "Sympoſion Beatricis, ſeu dialogorum de fide conjugali et virginitate, lib. iii." He likewiſe tranſlated, from the Greek into Latin, the works of Philoſtratus, Hermogenes, and Herodian. Gen. Dict.

BONGARS, James, a polite ſcholar and able negotiator, was born of proteſtant parents at Orleans in 1554. Having ſtudied firſt at Straſburg, and attended a courſe of law under Cujacius, he entered into the ſervice of the king of Navarre, afterwards Henry IV. by whom he was employed for 30 years in various negotiations, particularly with the German princes. Being at Rome in 1585, he wrote a ſevere reply to the violent bull fulminated by Pope Sixtus V. againſt Henry IV.; and he alſo publiſhed a ſpirited anſwer to a German piece, imputing the bad ſucceſs of the joint expedition in 1587, to the miſconduct of the French. He was diſtinguiſhed by his knowledge of books, and had collected a large library, a great part of which was at length annexed to the public library of Bern. As a critic he became known by a valuable edition of "Juſtin," Paris, 1581, 8vo. He alſo edited a collection of the Hungarian writers, and the "Geſta Dei per Francos." But his reputation was principally owing to his Latin letters, written during his negotiations, and publiſhed after his death, at Leyden, in 1647, and afterwards tranſlated into French. The ſtyle is clear, eaſy, and poliſhed, and they ſeem to have been dictated by an honeſt heart. A collection of his French letters, "Le Secretaire ſans fard," has alſo been publiſhed. Although a Calviniſt, Bongars diſapproved of the religious wars of that party. He died at Paris in 1612. Gen. Dict.

BONGO, or Bungo, in *Geography*, one of the iſlands of Japan. The principal town, ſeated on the eaſt ſide of the iſland, is called by the ſame name. This is a port oppoſite to Tonſa, and ſeparated from it only by a narrow channel. N. lat. 32° 41′. E. long. 131° 57′.

Bongo Pala, in *Botany*, Piſo. See Myristica *aromatica*.

BONGUATRORA, *Serpens ornatiſſima amboinenſis bonguatrora* of Seba, in *Zoology*, the name the *coluber ahætulla* bears among the natives in the iſland of Amboyna. See Ahætulla.

BONHAMPTON, in *Geography*, a town of America, in Middleſex county, and ſtate of New Jerſey; about 6 miles N.E. from New Brunſwick.

BONI, a kingdom of the iſland of Celebes, which lies on the weſtern ſide of a bay, called on that account the bay of Boni, is the ſecond kingdom, in point of importance, in the iſland. Its extent from the river Chiarana to the river Salenico is about 20 leagues; and within land it is bordered upon Soping, Lamoere, Macaſſer, and Boeleboele. In ancient times this kingdom was independent of, and unconnected with any other. It is ſtill in cloſe alliance with the two ſmall kingdoms of Soping and Loeboe, or Loehoe. The natives of Boni, that they may not appear inferior to the Macaſſers, deduce their origin in like manner from the gods. The firſt king they ſay, deſcended from heaven, and was known by the name "Matta Salompo," that is, the all-ſeeing. This ſovereign, their firſt monarch, inſtituted the laws of the country, which are ſtill obſerved; made the royal ſtandard, called "Worong Porong;" and appointed ſeven electors, under the denomination of "Matoua petoes." The prince or ſovereign is called "pajong;" and he is elected for life by ſeven nobles, which number is kept up by the pajong, and they are appointed by him from certain freeholders. The pajong is often reſtrained by a ſort of parliament, elected by the freeholders; it conſiſts of 400 members, 200 of which are called "mattona," 100 are called "pabicharro," and 100 are called "galarang." The firſt ſovereign, after reigning 40 years, reſigned the kingdom to his ſon, and, with his wife, aſcended again to heaven; and from him all the ſucceeding kings of Boni are deſcended; none others, beſides his poſterity, born of marriages with royal princeſſes, being entitled to the crown. Notwithſtanding the common deſcent of the rulers of Boni and Macaſſer from the gods, theſe two nations are avowed enemies. About the beginning of the 17th century the Bouginese, or people of Boni, and their queen, were compelled to conform to the mahometan religion; and the condition impoſed upon them was, that the enemies of Macaſſer ſhould likewiſe be the enemies of Boni, but not the enemies of Boni thoſe of Macaſſer. At this time Boni was able to bring 70,000 fighting men into the field. The hatred which was thus excited among the Bouginese againſt the Macaſſers, and their inceſſant quarrels, enabled the Dutch, who, as their intereſt required, favoured ſometimes the one party, and ſometimes the other, to make themſelves maſters of the iſland. The princes of Boni, Soping, &c. united themſelves to the Dutch by the Boni contract, which was concluded November 18th, 1667; and to this the Macaſſers were afterwards compelled to accede. At preſent the Bouginese are the moſt powerful, as the Macaſſers were about a century ago.

The Bouginese, or Buggeſſes as they are uſually called by the Engliſh, are of a middle ſize, and have a brown, but not dark, complexion. Among the female ſex in particular, ſome are found almoſt entirely fair. Their features in general are agreeable, only that their noſe is a little flattened. They are leſs open and more treacherous in their diſpoſitions than the Macaſſers; and never attack their enemies openly, but endeavour to fall upon them by ſurpriſe. Thoſe who never did them an injury are not ſecure from being murdered by them, when they can do it with privacy; and they often commit ſuch actions for no other reaſon, as they ſay, than to try the goodneſs of their kriſſes, or daggers. Many Macaſſers, as well as Europeans, have fallen ſacrifices to this thirſt for blood. Their daggers and aſſagays are commonly poiſoned, as well as their ſmall darts, which they can ſhoot at their enemies to a conſiderable diſtance by blowing them through a tube. Their clothing conſiſts of a piece of red or blue cotton cloth wrapped round the body, and drawn

between the legs. The upper part of the body is quite naked. On the head they wear a piece of cotton cloth in the form of an handkerchief, with which they cover their hair, which is as black as pitch, and very long. On the other parts of the body, neither the men nor women suffer any hair to grow; they pull it out by the roots, in the same manner as the Mahometans and Indians do, as soon as it appears. The food is chiefly rice, fish, and pisangs; and their beverage is water, though they are not destitute of "saqueer," or palm wine. The Bouginese women are in general much handsomer than those of the other Indian tribes; some of them, if their complexion had the same mixture of red and white as our females, would be accounted beauties in Europe. They are naturally of an amorous disposition, and are capable of undertaking any thing to gratify their inclinations. The Bouginese, who have in general adopted the mahometan religion, may have four wives, provided the husband can maintain them; but if they are not satisfied with each other, they may separate with as little trouble as they were united. They are a high spirited people, fond of adventures and emigration, and capable of undertaking the most dangerous enterprises. The appellation "Bugguese," has become, among Europeans in the east of India, synonymous with soldier, just as seapoy is in the west. The people of Celebes are very industrious, and they are very adventurous merchants; and the Bugguese, in particular, often find their way to the spice islands, in spite of the vigilance of the Dutch. They write their language from left to right, in a character peculiar to themselves; on the sea-coast they universally speak the Malay tongue, and have many Malay phrases in their own language. Their funerals are attended with very little ceremony. The body is wrapped up in a piece of white cotton cloth, and deposited in the grave, over which some sweet scented flowers are strewed, and two stones are erected, one at the head and another at the feet. Stavorinus's Voyage to the East Indies, vol. ii.

Boni, *bay of*, a bay in the kingdom of Boni, in the southern part of the island of Celebes. It is called Sewa by the natives, and Bugguess, or long bay, by the English. Of this bay we have the following account by Captain Forest. Having passed the strait between Celebes and Saleyer, called the "Budgeroons," keep on in a direction N.E. by N. about 130 miles, and you will find, near the west coast of the Sewa, a small island called "Baloonroo," visible 8 or 10 leagues off, and having some rocky islets at its east end. Farther on, about a day's sail, or about 60 miles, is the mouth of the river Chinrana, which takes its rise in the Warjoo country, the capital of which is Tosforo, lying a day's journey by water from the mouth of the river; it afterwards passes through Boni; it has a good muddy bar, passable by large ships, and is navigable a good way up; it has several mouths, and on its banks are many towns, which carry on a great trade in gold, rice, sago, cassia, tortoise-shell, pearls, &c. The anchorage is good off the river's mouth. Half a day's sail farther north, along the west coast of the Sewa, is the river Peeneekee, which is not very considerable. Farther on are two places called Akolingan and Telludopin, which are pretty well inhabited. Continuing still north, you come to the river Sewa, not very considerable; then to the river Loo, famous for boat-building; then you come to Mankakoo, where are gold and plenty of sago, very cheap, and also cassia and seed-pearl. Being now come to the bottom of "Buggess bay," the sago-tree abounds very much; and in many parts of the Sewa, there are spots of foul ground, on which they fish for swallow, which they generally carry to Macasser, to sell to the China junk. On the east side of the Sewa the country is not so well inhabited as on the west side. The south-east point of the Sewa is called "Pajungan;" where is a cluster of islands, rather small, among which is good anchorage. Stavorinus's Voyage, vol. ii. p. 213.

BONIEUX, a town of France, in the department of the Vaucluse, and chief place of a canton, in the district of the Apt. The place contains 2450, and the canton 6178 inhabitants; the territory comprehends 130 kiliometres, and 6 communes; 8 leagues E. of Avignon.

BONIFACE, in *Biography*. There are nine popes of this name. *Boniface* I. succeeded Zosimus in the year 418; and when the schism, occasioned by a party that favoured Eulalius, was terminated, he was fully established in possession of the papal see in 419. Before his election he was a presbyter of irreproachable character, and after his advancement he was a lover of peace; and though he maintained what he called the just rights of the Roman see, in the jurisdiction which his predecessors had exercised over the bishops of Illyricum, he made no attempt to extend his authority and claims. He revoked the privileges granted by Zosimus to the see of Arles, and restored them to the sees of Narbonne and Vienne, which had been unjustly deprived of them; and with a moderation that redounds much to his honour, he refused to interfere in a dispute which took place between the clergy of Valence and Maximus, their bishop. He died at a very advanced age, November 4, 422; was canonized as a saint in the church of Rome; and his festival was kept on the 25th of October. Bede gives credit to the relation of miracles wrought by this pope, and Baronius (ad ann. 423,) says, that he relieved Rome in the time of a famine.

Boniface II., a Roman by birth, and a Goth by descent, supplied the vacancy occasioned by the death of Felix III. in 520; and upon the death of a competitor, named Dioscorus, obtained quiet possession of the papal chair. This pope confirmed the decrees of some Gallican bishops, who condemned the semipelagian doctrine; and in 531 he proposed to alter the mode of electing a pope, and to assume the prerogative of appointing his successor. He obtained a decree for this purpose, and actually nominated a deacon, whose name was Vigilius. But at a second council the Roman senate, in concurrence with the bishops and clergy, obliged the pope to revoke his former decree, and to acknowledge himself guilty of high treason. Boniface died in October, 532.

Boniface III., a native of Rome, succeeded Sabinian, after a vacancy of almost a year, in 607; and having ingratiated himself with the emperor Phocas, to whom he was deputed as a nuncio by pope Gregory, in 603, he obtained from this tyrant the title of "universal bishop," and "head of the church," which was taken from the bishop of Constantinople, and transferred to Boniface and his successors in the see of Rome. Thus, says Bower, was the power of the pope, as universal bishop and head of the church, or in other words, the papal "supremacy," first introduced. It owed its original to the worst of men; it was procured by the basest means, or by flattering a tyrant in his wickedness and tyranny; and according to the previously declared judgment of Gregory the great, it was in itself "anti-christian, heretical, blasphemous, and diabolical." Boniface afterwards assembled a council for settling the election of bishops, in which they were forbidden to nominate their own successors, and the consent of the people, clergy, and sovereign, and the confirmation of the pope, were made necessary. Boniface died in November 607.

Boniface IV., a native of Valeria, in the country of the Marsi,

Marsi, was elected to the papal see in August 608; and having obtained from Phocas the grant of the pantheon, converted it into a church, dedicating it to the Mother of God and the Christian Martyrs. He held a council at Rome to settle some affairs of the English church, at which Mellitus, the first bishop of London, is said, by Bede, to have attended; but the acts of this council, and some pieces ascribed to Boniface, are thought to be spurious. He died in 615, and was sainted.

Boniface V., a native of Campania, and a presbyter of the Roman church, succeeded Deusdedit in December 619. In 624 he sent the pall to Justus, the successor of Mellitus in the see of Canterbury, and interested himself in the propagation of Christianity in Britain, by sending letters and presents to Edwin the king of Northumberland, and also to his queen Edelberg, sister of Eadbald king of Kent, who having assumed the Christian profession, was allowed by her marriage articles the free exercise of it. He died in October 625. Some decretal epistles, relating to matters of small importance, are ascribed to him. According to Mosheim (Ecc. Hist. vol. ii. p. 185), this Boniface enacted that infamous law, by which the churches became places of refuge to all who fled thither for protection; a law which procured a sort of impunity to the most enormous crimes, and gave a loose rein to the licentiousness of the most abandoned [illegible].

Boniface VI., was a Roman of infamous character, and succeeded Formosus in 896. Baronius (ad ann. 897.) will not allow him a place among the popes. He died soon after his election.

Boniface VII., denominated "Anti-pope," was a deacon of the Roman church, of the name of Franco, and advanced to the papal chair in 975, upon the death of Benedict VI. to whose murder he is said to have contributed. Soon after his election he was constrained by an adverse party to leave Rome and to fly to Constantinople; but he carried with him the treasures of St. Peter. Gerbert styles him "of all monsters of wickedness the most wicked." Upon the death of the emperor Otho II. in 984, he returned to Rome, and occupied the see in the room of John XIV. whom he displaced, imprisoned, and put to death. Franco died in 985; and he had rendered himself so odious by his tyrannical conduct, that his corpse was treated with the utmost indignity, and dragged naked through the streets.

Boniface VIII., a native of Anagni, and a descendant of the noble family of Cajetani, was employed by popes Martin IV. and Nicholas IV. in several important legations, and succeeded pope Celestine V. whom he artfully persuaded to resign, in December 1294. The beginning of the following year he was enthroned at Rome with great solemnity and parade; in the procession from St. Peter's, where he was consecrated and crowned, to the Lateran, for the purpose of being enthroned, he was mounted on a white horse, richly caparisoned, with the crown on his head, whilst the king of Apulia held the bridle in his right hand, and the king of Hungary in the left, both on foot. His subsequent conduct corresponded to the haughty grandeur of his installation. In order to secure himself against any future trouble from Celestine, he confined him in prison at Anagni, where he died. Failing to mediate a peace between James king of Arragon, and Charles II. king of Sicily, he formed an alliance against Frederic of Arragon, whom the Sicilians had made their king, and proceeded to excommunicate him and all his adherents; but he was at length obliged to confirm him in his dominions. His next measure was that of humbling the family of Colonna, two cardinals of which had opposed his election; for this purpose, after having declared the whole family infamous by a public decree, confiscating their estates, and excommunicating all who countenanced or protected them, he ordered a crusade to be preached against them and their friends, demolished their houses and castles, and obliged them to seek shelter in foreign countries; and he moreover punished with utter demolition the city of Præneste, for its attachment to them. To Boniface is commonly ascribed the institution of the jubilee in 1300. See JUBILEE. In his attempt to mediate a peace between Philip the Fair king of France, and Edward I. king of England, he was charged with partiality to the latter, so that Philip could be prevailed on merely to agree upon a truce; and his enmity against Boniface, which was smothered for some time, at length broke out into a flame. Philip, with a view of supporting the war against England, prohibited the exportation of any gold or silver from the kingdom without his permission; and Boniface, apprized that this order was levelled against the see of Rome, issued a bull, forbidding secular princes to exact, and the clergy to pay, any sums from the ecclesiastical revenues, without his approbation. The animosity between the pope and the French potentate was increased by the arrogance with which a legate from Rome delivered the pope's message, enjoining the king of France, in common with other Christian princes, to aid the king of Tartary in a war against the Saracens, and by the subsequent arrest of the legate. Boniface, much enraged, dispatched a nuncio to demand his release; and in case of refusal, threatened to declare the kingdom devolved to the holy see, to absolve his subjects from their allegiance, and to summon all the Gallican bishops to Rome. The king resented this violent proceeding, renewed the prohibition against carrying money out of the kingdom, and forbade his ecclesiastics on any pretence to visit Rome. In these hostile measures the king was supported by the states of the nation, which appealed to a general council, and Boniface prepared to fulminate a decree of excommunication and forfeiture of his crown against Philip. Nogaret and Sciarra Colonna were sent, on this occasion, into Italy to excite the persecuted Ghibellines against the pope, who was then at his palace in Anagni. They secretly approached it with a body of troops, and made themselves masters of the person of Boniface and all his treasures. During the three days of his confinement the pope was treated with great indignity, particularly by Colonna. At length the people of Anagni, recovering from their consternation, rescued the pope from his captivity: who returned to Rome, where he was seized with a fever, which terminated his life in October 1303. He was buried at St. Peter's in a grand mausoleum, which he had erected for himself. Although Boniface has been justly extolled for his learning, intrepidity, and experience in public affairs, and for his patronage of literature; he was arrogant and overbearing, ambitious, crafty, and violent, and avaricious to such a degree, that he was intent upon accumulating riches to exalt the church and aggrandize his own relations. He was the author of several works, such as epistles and decrees, two discourses on the canonization of Lewis IX. of France, called St. Lewis; two famous prayers, one to our Saviour, and the other to the Virgin. He also caused to be published the sixth book of the decretals, and wrote a treatise entitled "De regul's juris."

Boniface IX., a native of Naples, descended from a noble family in reduced circumstances, whose name was Peter Thomacelli, was more distinguished by his prudence and address than for his profound and extensive learning, and was elected pope at Rome upon the death of Urban VI. in 1389. The greatest part of his pontificate was devoted to negotiations with his rivals at Avignon, Clement VII. and Benedict XIII.

in which were displayed on both sides much cunning and artifice, and at the same time an inflexible resolution of retaining the tiara. Boniface was arbitrary in the exercise of power; and towards the end of the year 1394 he would have been massacred by the people, if he had not been seasonably rescued from the enraged multitude by the interposition of Ladislaus, king of Naples, who happened to be then at Rome. He afterwards retired to Perugia, and from thence he removed to Assisi; but on the approach of the jubilee year, 1400, the Roman people, apprehending, that in the absence of the pope it would not be celebrated with the usual solemnity, and the pecuniary interests affected, deputed an embassy to invite his holiness to Rome. Upon his arrival he was received with joy and invested with extraordinary powers, in the exercise of which he repaired and fortified the walls and towers of the city, and the castle of Angelo, and also placed garrisons in them, so that he made himself absolute master of the city. Some ascribe to Boniface the institution of Annates (See Annates); but though the origin of these is of more ancient date, he is allowed to have been in a very high degree avaricious and rapacious, to have sold church preferments to the best bidder, without regard to merit or learning, and to have made it his constant study to enrich his family and relations. He died of a paroxysm of the stone in 1404. Bower's Hist. of the Popes.

Boniface, called the "Apostle of the Germans," was a native of England, whose original name was "Winifrid," born in Devonshire, A.D. 670, and was educated in a Benedictine monastery at Exeter. This famous ecclesiastic, who was ordained a priest A.D. 700, with two companions, passed over into Friesland in 703, in order to preach the gospel among the heathens; but failing in his first attempt, on account of a war which broke out between Radbod the king of that country, and Charles Martel, he returned to England. However, he resumed his pious undertaking in 718; and at Rome he was solemnly empowered by the Roman pontiff, Gregory II. to preach the gospel not only in Friesland, but throughout Germany; which commission he executed with considerable success. In the year 723, he was consecrated bishop by Gregory II., who changed his name of Winifrid into that of Boniface; and he is said to have been the first who took a solemn oath of obedience to the pope, which he did at this time. Upon his return to Germany, with the instructions of the pope, and the peculiar protection of Charles Martel, he preached in Thuringia, Hessia, and Bavaria, and erected a great number of Christian churches. As these were too numerous to be governed by one bishop, this prelate was advanced to the dignity of archbishop, in 732, by Gregory III., under whose authority, and the auspicious protection of Carloman and Pepin, the sons of Charles Martel, he founded in Germany the bishoprics of Wurtzbourg, Burabourg, Erfurt, and Aichstadt; to which he added, in 744, the famous monastery of Fulda. His last promotion, and the last recompence of his assiduous labours in the propagation of the truth, was his advancement to the archiepiscopal see of Mentz, A.D.746, by pope Zachary, by whom he was at the same time created primate of Germany and Belgium. In his old age he returned again to Friesland, that he might finish his ministry in the scene of its commencement; but his piety and zeal were ill rewarded by that barbarous people, by whom he was murdered in 754, together with fifty ecclesiastics, who accompanied him, and who shared the same fate. He was interred in the abbey of Fulda, and canonized by the church of Rome, to which he was ardently devoted. His zeal for the glory and authority of the Roman pontiff equalled, if it did not surpass, his solicitude for the service of Christ, and the propagation of his religion; and in combating the heathen superstitions, he recurred to other weapons than those which Christianity recommended, employing violence and terror, and sometimes artifice and fraud, in order to multiply the number of Christians. His epistles, and those of his coadjutors, first published with notes by Serrarius, in 1605, and re-published in 1629, are written in a barbarous style, and discover an imperious arrogant temper, a cunning and insidious turn of mind, an excessive zeal for increasing the honours and pretensions of the sacerdotal order, and a profound ignorance of many things, the knowledge of which was indispensably necessary in an apostle, and particularly of the true nature and genius of the Christian Religion. The Benedictines have published his statutes, and some of his sermons. Bower's Hist. of the Popes, vol. iii. Mosheim's Eccl. Hist. vol. ii. p. 205, &c. Cave's Hist. Lit. t. 1. p. 622. Dupin, Eccl. Hist. cent. 8.

Boniface, count of the Roman empire, one of the two generals of Placidia, the mother of Valentinian III., Aetius being the other (see Aetius), who have been deservedly named as the last of the Romans; was the intimate friend of St. Augustine, bishop of Hippo, but incurred his displeasure by marrying a wife of the Arian sect, after a solemn vow of chastity, and a resolution of retiring from the world, and by some other instances of licentious conduct with which he was charged. However the people applauded his spotless integrity, and the army dreaded his impartial and inexorable justice. Of his justice, the following singular fact is recorded. A peasant, who complained of the criminal intimacy between his wife and a Gothic soldier, was directed to attend his tribunal the following day; in the evening, the count, who had diligently informed himself of the time and place of the assignation, mounted his horse, rode ten miles into the country, surprized the guilty couple, punished the soldier with instant death, and silenced the complaints of the husband by presenting him, next morning, with the head of the adulterer. Boniface, having defended Marseilles, when attacked by Ataulphus, was rewarded by the emperor Honorius with the command of the troops in Africa, which province he rescued from the repeated attempts of John, who usurped the empire. Placidia, who assumed the government of the empire during the minority of her son, highly pleased with his bravery and loyalty, called him to court upon the death of that usurper, preferred him to the post of "comes domesticorum," and sent him into Africa with unlimited power. These marks of favour excited the jealousy of Aetius (see Aetius), who artfully contrived, under the mask of friendship, to engage Boniface in a revolt, which took place in 427. Accordingly, Placidia declared him a public enemy, and sent troops against him. Having defended himself for some time, he found at length that he was likely to be overpowered; and therefore, after some hesitation, the last struggle of prudence and loyalty, he dispatched a trusty friend to the camp of Gonderic, king of the Vandals, with the proposal of a strict alliance, and the offer of an advantageous and perpetual settlement. The Vandals accepted the proposal, and Genseric, who succeeded his brother, and whose ambition had neither bounds nor scruples, transported his troops from Spain into Africa in 429, and obtained, by the concurrence of several favourable circumstances, an easy conquest. Placidia discovered, when it was too late, the artifice that had beeen practised by Aetius; and Boniface, who also perceived and lamented his error, returned to his allegiance. But his efforts to recover Africa were unavailing; and he was under a necessity of abandoning the country, and of returning to Ravenna, where

where he was kindly received by Placidia, and advanced to the rank of patrician, and the dignity of maſter-general of the Roman armies. The haughty and perfidious ſoul of Aetius was exaſperated by the honourable mode of his reception, and he haſtened to return from Gaul to Italy, with an army of Barbarian followers, and to decide his quarrel with Boniface in a bloody battle. Boniface was ſucceſsful; but in the conflict he received a wound from the ſpear of his adverſary, of which he expired within a few days, A.D. 432. Before his death he is ſaid to have teſtified his forgiveneſs of Aetius's treacherous conduct, to ſuch a degree, as to exhort his wife, a rich heireſs of Spain, to accept him for her ſecond huſband. Anc. Un. Hiſt. vol. xiv. Gibbon's Hiſt. &c. vol. vi.

BONIFACE, NATALIS, an engraver of great merit, who flouriſhed in Italy, towards the concluſion of the 16th century. His works are chiefly etchings, performed in a ſlight, fine ſtyle; and his ſmall figures he executed with great ſpirit. His chief work was the plates compoſed by D. Fontana, architect to pope Sixtus V. concerning the removal of the Vatican obeliſks. Strutt.

BONIFACIA, in *Botany* (J. Bauhin). See RUSCUS *racemoſus*.

BONIFACIO, or BONFACIO, in *Geography*, a ſea-port town of the iſland of Corſica, department of Liamone, and chief place of a canton, in the diſtrict of Sartene, on the ſouth coaſt, and in the ſtrait between the iſlands of Sardinia and Corſica. The town is ſmall and fortified, and the canton contains 3172 inhabitants; 28 leagues ſouth of Baſtia. N. lat. 41° 24′. E. long. 9° 20′.

BONIFACIO *Point*. See BALDIVIA.

BONIFACIO *Strait*, commences near the town of the ſame name, on the S. E. of the iſland of Corſica; and its length to point Tico, the moſt northerly point of Sardinia, is 2½ leagues.

BONING, in *Surveying* and *Levelling*, &c. is the placing of three or more rods or poles, all of the ſame length, in or upon the ground, in ſuch a manner, that the tops of them all may be in one continued ſtraight line, whether it be horizontal or inclined, ſo that the eye may look along the tops of them all, from one end of the line to the other.

BONJOUR, WILLIAM, in *Biography*, a learned Auguſtin, was born at Toulouſe in 1670; and at Rome, whither he was ſent for by cardinal Norris in 1695, he became diſtinguiſhed by his learning and piety. He was employed by pope Clement XI. in ſeveral matters of importance, and particularly in the examination of the Gregorian calendar. Bonjour had alſo the ſuperintendence of the ſeminary eſtabliſhed by cardinal Barbarigo at Monteſiaſcone, and denominated the Academy of Sacred Letters. He was acquainted with almoſt all the oriental tongues, and more eſpecially with the Coptic, or ancient Egyptian. Actuated by a zeal for acquiring knowledge, and for propagating the goſpel, he viſited China, where he died in 1714, whilſt he was employed in forming a map of that empire. His works are, "Select Diſſertations on the Scriptures;" "An Account of the Coptic MSS. in the Vatican;" "A Coptic Grammar;" and "A Roman Calendar." Moreri.

BONIS ARRESTANDIS NE DISSIPENTUR. See ARRESTANDIS.

BONIS *non amovendis*, a writ directed to the ſheriffs of London, &c. where a writ of error is brought, to charge them that the perſon againſt whom judgment is obtained be not ſuffered to remove his goods, till the error is tried and determined.

BONIS, *terris, et catallis rehabendis poſt purgationem*. See TERRIS.

Arreſto facto ſuper BONIS *mercatorum*. See ARRESTO.

BONITO, in *Ichthyology*, ſynonymous with the French *bonite*. This appears to be a name aſſigned indiſcriminately to more than one or two kinds of fiſhes, although it ſeems to be confined in ſome degree to thoſe of the SCOMBER genus. The *ſcomber pelamis* of Loefl. is the fiſh mentioned under the name of *bonito* by Oſbeck, who alſo calls it *ſcomber pulcher*. The *bonito* is vaguely deſcribed as a large ſea-fiſh, with a long, broad, and thick body; eyes, and likewiſe the gills, large; and the greater part of the body free from ſcales. It is obſerved ſtill further to be a fiſh of great beauty, and very common in ſome ſeas; our Eaſt India ſhips uſually falling in with immenſe ſhoals of them. It is impoſſible to ſay whether this may be the *ſcomber pelamis*, or not; but as a matter of opinion, we think it to be the ſame, becauſe the latter is found in immenſe ſhoals between the tropics, and in the Atlantic ocean. The bonito of Bloch (*le bonite de Bloch*) bears the Latin name of *ſcomber ſarda*.

BONITON, the common French name of SCOMBER *amia* of Linnæus.

BONIZO, in *Geography*, a town of Italy, in the duchy of Mantua, on the ſouth ſide of the Po, oppoſite to Oſtiglia.

BONKOSE, in *Ichthyology*, the SCIÆNA *nebuloſa*, a fiſh diſcovered by Forſkal in the Red ſea. Bonkoſe is the name it bears in Arabia.

BONLIEU, in *Geography*, a town of France, in the department of the Ardeche; 5 leagues N. N. W. of Tournon.

BONN, in Latin *Bonna*, a ſmall but populous and fortified city of Germany, in the circle of the Lower Rhine, and electorate of Cologne, or, according to the French arrangement, the chief place of a diſtrict, in the department of the Rhine and Moſelle; the place contains 8837, and the canton 18,951 inhabitants; and its number of communes is 31. The number of houſes is ſaid not to exceed a thouſand; and as it has little foreign trade, moſt of the inhabitants are attracted thither by its being the reſidence of the elector of Cologne. The ſtreets are narrow, crooked, dirty, and badly paved, and in winter badly lighted. The public walks are few, and not very agreeable. The churches are ſtately; and the town-houſe is adorned with fine paintings. The Jews at Bonn have a ſtreet to themſelves, conſiſting of 21 houſes; and their number is eſtimated at 250. Bonn was taken from Louis XIV. into whoſe hands it was ſurrendered by the elector, in 1673, by William prince of Orange; in 1689, by the marquis of Brandenburgh; in 1703, by a detachment of the duke of Marlborough's army, after a ſiege of three weeks, and the loſs on both ſides of 2000 men; and on the 6th of October, 1794, by the troops of the French republic. It is ſituated 14 miles S. S. E. of Cologne, 30 E. of Aix-la-Chapelle, and 28 N. N. W. of Coblentz. N. lat. 50° 40′. E. long. 7°.

BONNA, in *Zoology*, ſynonymous with BONASUS; which ſee.

BONNAGHT, or BONNAGH, an old term, which occurs frequently in *Iriſh hiſtory*, and was the ſame with *coin and livery*; being a certain proportion of meat, drink, and money for the maintenance of a ſoldier, and ſometimes free quarter. Hollingſhead ſpeaks of it as an Iriſh impoſition, which beggared the farmers; and ſir John Davis, the eminent attorney-general of Ireland in the reign of James I. in his juſtly admired tract, entitled "A Diſcovery of the Cauſes, why Ireland was never ſubdued," has theſe words: "But the moſt wicked and miſchievous cuſtom of all others, was that of *coin and livery*, which conſiſted in taking of man's meat, horſe meat, and money, of all the inhabitants of

of the country, at the will and pleasure of the soldier, who, as the phrase of the Scripture is, *did eat up the people, as it were bread*, for that he had no other entertainment. This extortion was originally Irish, for they used to lay *bonnaght* upon their people, and never gave their soldiers any other pay. But when the English had learned it, they used it with more insolence, and made it more intolerable; for this oppression was not temporary, nor limited either to place or time, but because there was every where a continual war, either offensive or defensive, and every lord of a country, and every marcher, made war and peace at his pleasure, it became universal and perpetual, and was indeed the most heavy oppression that ever was used in any Christian or Heathen kingdom." The curious reader will do well to consult the whole passage in sir J. Davis's Historical Tracts, p. 132. et seq. of the edition printed in 8vo. Dublin, 1787. This practice was forbidden by the statute of Kilkenny passed in 1450, and by several succeeding acts, in one of which (under Henry VII.) it is called a *damnable custom*. Spenser, in his "View of the state of Ireland," seems, however, to think the statute unnecessarily severe in making it treason. Hollingshead. Irish Statutes. Spenser's State of Ireland.

BONNART, John, in *Biography*, barber surgeon, and master of the college of surgeons at Paris, published, in 1629, "La Semain des medicamens observée, et chefs d'œuvres des maitres barbiers chirurgiens de Paris," 8vo. It contains a course of study necessary for young men previous to their being elected into the college, with observations on the method of treating such complaints as come under their care. The author strongly recommends opening the jugular vein in cases of quinsey. "Methode pour bien seigner les accidens qui arrive pour etre mal fait," 8vo. 1628. Haller Bib. Med. Eloy.

BONNAT, in *Geography*, a town of France, and chief place of a canton, in the department of the Creuse, and district of Gueret; the place contains 2032, and the canton 10,804 inhabitants; the territory comprehends 257½ kiliometres, and 12 communes.

BONNAUD, in *Biography*, published, in 1770, "Degradation de l'espece humaine par l'usage des corps de baleine," 12mo. Paris. In this very sensible and ingenious little work, the author forcibly represents the various evils consequent on using stays stiffened with whale-bone: these are indigestion, and other disorders of the stomach, ruptures, and difficult respiration, often terminating in consumptions; besides, they not unfrequently occasion deformity of the body, which they are supposed by their admirers to contribute in preventing. Haller Bib. Med.

BONNAY, in *Geography*, a town of France, in the department of the Doubs, and chief place of a canton, in the district of Besançon, 2 leagues N. of Besançon.

BONNE, a town of Savoy, in the Lower Faucigny, 10 miles E. S. E. of Geneva. N. lat. 46° 11′. E. long. 6° 7′.

Bonne, a bay on the west coast of Newfoundland. N. lat. 49° 35′. W. long. 53°.—Also, a bay on the coast of Spain in the Mediterranean, nearly east from Malaga. N. lat. 36° 42′. W. long. 2° 40′.

BONNEBOSQ, a town of France, in the department of the Calvados, and chief place of a canton, in the district of Pont l'Eveque, 2 leagues S.W. of Pont l'Eveque.

BONNEFONS, John, or Bonnefonius, in *Biography*, was born, in 1554, at Clermont in Auvergne, became an advocate in Paris, and, in 1584, lieutenant-general at Bar-sur-Seine, and died in 1614. He was distinguished as a Latin poet, and particularly by that kind of poetry, which is the short verse of Catullus, abounding with diminutives and tender expressions. Of this kind is the piece entitled "Pancharis," which is reckoned the most elegant performance of any modern writer. It seems to have been the aim of Bonnefonius to imitate Joannes Secundus, the celebrated author of the Basia; and his resemblance, with regard to softness and sweetness, has approached the extreme of lasciviousness and effeminacy. His poems in heroic verse have also been esteemed. The Pancharis was published at Paris in 1588, and translated into French by La Bergerie; and all the poems of Bonnefonius are printed after those of Beza, in Barbou's edition of the latter, Paris, 1757. There are London editions in 1720 and 1727. A son of Bonnefonius distinguished himself by Latin poetry, chiefly written on public characters and events. Nouv. Dict. Hist.

BONNER, Edmund, an English prelate of detestable memory as a persecutor of Protestants, was born, as it is generally believed, of poor parents at Hanley, in Worcestershire; but some have affirmed that he was the natural son of George Savage, rector of Davenham, in Cheshire. About the year 1512, he was admitted a student of Broadgate hall (now Pembroke college) in the university of Oxford, famous at that time for the education of civilians and canonists. In 1519, he took his degrees of bachelor of the canon, and bachelor of the civil law; and about the same time entered into holy orders. In 1525, he was created doctor of the canon law. More distinguished by his talents for business than for his learning, he was appointed commissary of the faculties by cardinal Wolsey, who conferred upon him a plurality of ecclesiastical benefices. After the cardinal's death, he contrived to insinuate himself into the favour of king Henry VIII., and became a zealous promoter of the reformation, as well as an advocate for the king's divorce from queen Catharine, and a strenuous supporter of the measures that were adopted for abolishing the pope's supremacy in this kingdom. He was also patronized by Cromwell, secretary of state, and employed as ambassador at several courts. In 1532, he was deputed on an embassy to Rome, to excuse the king's appearance to a citation at that court; and in 1533, he was sent to pope Clement VII. then at Marseilles, to deliver the king's appeal from the pope to the next general council against his excommunication; and on this occasion he exposed himself by his boldness and indecent warmth to personal danger. He was likewise employed in other embassies to the kings of Denmark and France, and to the emperor of Germany. Being recalled from France in 1538, on account of the boldness with which he remonstrated against the protection afforded to an English traitor, he was nominated to the bishopric of Hereford, and, before his consecration, translated to the see of London in 1539. At the time of the king's death in 1547, he was ambassador at the court of Charles V. Till this time he appears to have concurred in promoting the reformation; and by the subserviency of his principles to his interest, as well as by his capacity for public business, he secured the favour and confidence of his tyrannical master. But from his subsequent conduct it is evident that he was secretly attached to the Romish religion; for soon after the accession of Edward VI., he scrupled to take the oath that was required for renouncing the pope's authority, and he protested against the king's injunctions and homilies, which, however, he had never read. But being committed to prison for disobedience, he afterwards recanted, and was released. Whilst he outwardly professed zeal for the reformation, he privately used all the means in his power for obstructing its progress and establishment. His conduct warranted the suspicions that were entertained of his sincerity; and in order to bring it to a test, he

he was ordered by the privy council to preach at St. Paul's croſs on certain articles, connected with the principles of the reformation, and given to him in writing. But he performed this ſervice in a manner ſo unſatisfactory, that, upon the complaints of Hooper and Latimer, commiſſioners were appointed to proceed ſummarily againſt him; the reſult of which was, that he was committed to priſon, and deprived of his biſhopric. Theſe proceedings, allowed even by his enemies to be arbitrary and ſevere, rouſed his reſentment; nor was he long obliged to wait for an opportunity of ample retaliation. Upon the acceſſion of Mary to the throne, he was reſtored to his biſhopric, by a commiſſion dated Auguſt 1553; and in the convocation of the following year, he was appointed preſident in the room of Cranmer, who was committed to the tower. In this year he viſited his dioceſe, and induſtriouſly rooted up all the ſeeds of the reformation. In the four ſucceeding years he was an active and ſavage perſecutor; and he is ſaid to have committed to the flames 200 perſons, who avowed their firm adherence to the proteſtant religion, and who refuſed to embrace the groſs errors of popery, beſides impriſoning and torturing many more. Bonner's diſpoſition was in the higheſt degree cruel and ferocious; and religious bigotry, grafted on a temper naturally ſavage, rendered him a fit inſtrument to be employed by the artful Gardiner in the condemnation and execution of heretics. But though his nature did not ſeem to recoil at this ſavage employment, he dreaded the increaſed odium that attended it, and refuſed any longer to be the executioner of the laws. However, in 1556, he concurred in the degradation of Cranmer, and enjoyed the malignant pleaſure of triumphing over him with his uſual inſolence. In the following year his name was inſerted in a kind of inquiſitorial commiſſion for ſearching after, and puniſhing all heretics, as all perſons who were of the proteſtant religion were then denominated. Upon the acceſſion of Elizabeth, he had the effrontery to accompany the other biſhops in their progreſs for meeting her at Highgate; but ſhe looked upon him with feelings of juſt indignation and horror, as a man polluted with blood. He remained for ſome months unmoleſted; but in May 1559, he was ſummoned before the privy council; and refuſing to take the oaths of allegiance and ſupremacy that were tendered to him, he was deprived of his biſhopric, and committed to priſon. In this ſtate of confinement he remained for ſome years, bearing his reverſe of condition with a degree of cheerfulneſs which might have become a better man, and occaſionally warding off, by keen and humourous repartees, the popular inſults that were offered him. He died in priſon, September 5, 1569; and was buried at midnight in St. George's church-yard, Southwark, leſt any indignities ſhould be offered to his remains by the incenſed populace. Bonner was ſingularly ſavage in his natural temper, bluſtering and prophane in his converſation and manners, furious and violent in his conduct, groſs and corpulent in his perſon, and in every reſpect fitted for the part he acted, as an unrelenting and brutal perſecutor. He was generally regarded as deſtitute of any fixed principles; and he has been charged even with Atheiſm. As a canoniſt and politician he was allowed to excel; but his knowledge of divinity was very imperfect, and he had no reputation for learning. However, ſeveral pieces, theological, controverſial, and paſtoral, were publiſhed under his name. By his intereſt with queen Mary, he obtained ſeveral advantages for the ſee of London, which his ſucceſſors have enjoyed. Biog. Brit.

BONNET, Charles, an eminent natural philoſopher, was born at Geneva in 1720, and educated under a domeſtic tutor, whom his father provided for him, as affording ſuperior advantages to thoſe which he enjoyed in any of the public ſchools. At the early age of 16, he diſcovered that peculiar inclination of his mind, which led him to thoſe ſtudies that laid the foundation of his future fame and excellence. From the peruſal of the Spectacle de la Nature, he was induced to direct his particular attention to the ſtructure and manners of the ant-lion, and added many curious obſervations relating to it, to the facts that had been previouſly collected by Meſſ. Poupart and Reaumur; and he was further led by the Memoirs on Inſects, publiſhed by the latter, to repeat many of his experiments, and to diſcover new facts, which indicated in a youth of 18 a degree of ſagacity and reſearch that ſurpriſed and gratified this eminent naturaliſt, by whom he was encouraged to proceed. The intereſting obſervations which he made on different ſpecies of caterpillars, and other inſects, in the years 1738 and 1739, were communicated by him to Reaumur. His father had deſtined him to the profeſſion of the law; but the ſtudy of natural hiſtory was his choſen and favourite employment. Having, in 1740, decided a queſtion that had been left unſettled by Reaumur, reſpecting the multiplication of tree-lice, or aphides, without actual conjunction, he communicated a paper on this ſubject to the Academy of Sciences at Paris, and in conſequence of it, had the honour of becoming a correſpondent of that illuſtrious body. His eyeſight was irreparably injured by the minuteneſs of his reſearches on the generation of theſe animals. In 1741, he found that many ſpecies of worms poſſeſs, in a degree, the reproductive power of the polype; and in 1742, he diſcovered that the reſpiration of caterpillars and butterflies, was effected by means of their pores called "Stigmata." The tænia, or tape-worm, was alſo a ſubject of his ſucceſsful inveſtigation. In 1743, he was advanced to the rank of doctor of laws, and on this occaſion he totally abandoned the profeſſion of the law. A paper on inſects, which was this year communicated to the Royal Society of London, obtained for him the honour of being elected a member. His obſervations on aphides and worms, under the title of "Inſectology," were publiſhed in 1744; and this work was introduced with a preface, in which he gave a brief ſketch of his ideas concerning the developement of germs, and the ſcale of organized beings. This work was very favourably received by the public; but ſuch had been the nature of his reſearches and the aſſiduity of his application, that his eyes and his health failed him; and he was reduced to the diſtreſſing neceſſity of laying aſide his microſcope, and of deſiſting from reading and writing. This ſelf-denial, peculiarly afflictive to his ardent mind, he bore, however, with philoſophical reſignation; and by a total intermiſſion of his ſtudies he had the ſatisfaction of regaining a conſiderable degree of health and eaſe, though he was never able to employ his eyes as he had been accuſtomed to do. In 1746, he commenced a courſe of experiments on the vegetation of plants in moſs and other ſingular ſubſtances; and in the following year he examined with minute attention the leaves of plants, with a view of aſcertaining the appropriate action of their upper and under ſurfaces. He alſo employed coloured injections for the purpoſe of determining whether the ſap aſcends by the bark or wood; and he made various obſervations on vegetable monſters, and other circumſtances of vegetation, which were communicated to the public in one of the moſt curious and original of his works, entitled, "Inquiries into the uſe of the leaves of plants," firſt publiſhed at Leyden, in 1754, 4to.; to which ſupplements have been added as late as the year 1779.

Bonnet, probably conſtrained to remit his attention to experiments by the circumſtances already mentioned, directed his

his speculative researches to the faculties of the human mind; and having collected a mass of materials on this subject, he published a kind of abridgment of them, under the title of an "Essay on Physiology," in 1755, at London. This work, which appeared without his name, and which he did not acknowledge for 30 years, contains a concise statement of the fundamental principles of his philosophy. "It traces the origin and progress of the human mind, from the first germ of life, to the developement of all its faculties, the mutual dependence of which it points out, as deduced from actual observation. It enters into the difficult subject of human liberty, and endeavours to reconcile it with the divine prescience, and with the philosophical principle, that every effect must have an adequate cause. From the essential properties of the activity of the soul, and the effects of habit upon it, the whole art of education and government is deduced; and a system of the former is laid down, materially different from the usually established methods." Our author's metaphysical ideas were evidently founded on the principles of Malebranche and Leibnitz; but as he had freely discussed some points of a delicate nature, and which were likely to involve him in personal controversy, he chose to conceal his name. His next work, the fruit of five years' labour, was an "Analytical Essay on the faculties of the Soul," first printed at Copenhagen in 1760, 4to. at the expence of the king of Denmark. In this work he assumes the hypothesis of a statue organized like the human body, which he animates by degrees, and shews how its ideas would arise from impressions on the organs of sense. Although this performance was well received by some philosophers, it soon subjected the author to the charge of materialism and fatalism; but to this charge he made no reply. Accustomed to retirement, to which mode of life he was obliged to recur, on account of his deafness and other bodily infirmities, he sought the comforts of a domestic life; and in 1759, he married a lady of respectable family, the aunt of the celebrated Saussure, with whom he passed 37 years of connubial felicity. In the prosecution of his physical system, Bonnet published at Amsterdam in 1762, his "Considerations on organized bodies," 2 vols. 8vo. The principal objects of this work were, to detail, in an abridged form, all the most interesting and well ascertained facts, respecting the origin, developement, and reproduction of organized bodies; to refute the different systems founded upon "epigenesis;" and to explain and defend the system of germs. His "Contemplation of Nature," which appeared in 1764, Amst. 2 vols. 8vo., was a popular work, displaying the principal facts relating to the different orders of created beings, in an instructive and entertaining manner, and recommended by the charms of an eloquent style, with a constant reference to final causes, and the proofs of wisdom and benevolence in the creator. This was translated into several European languages, and enriched with notes by the author himself, and also by others, in a new edition. His concluding work was his "Palingénésie Philosophique," printed at Geneva in 1769, 2 vols. 8vo. This treats on the past and future state of living beings, and supports the idea of the revival of all animals, and the perfecting of their faculties in a future state. To this work he annexed "An inquiry into the evidences of the Christian revelation, and the doctrines of Christianity, which, with a piece "On the existence of God," was published separately at Geneva in 1770.

Towards the year 1773 he resumed his attention to natural history, and published, in Rozier's journal, a memoir on the method of preserving insects and fish in cabinets. In the following year he sent to the same journal a memoir on the loves of plants, originating in the discovery of a kind of cleft or mouth in the pistil of a lily. Other memoirs contained a detail of his experiments on the reproduction of the heads of snails, and of the limbs and organs of the water salamander. He also made observations on the pipa or Surinam toad, on bees, on the blue colour acquired by mushrooms from exposure to the air, and on various other subjects in natural history. His reputation introduced him as an associate into most of the literary societies of Europe; and in 1783 he was elected into the select number of foreign associates of the academy of sciences in Paris. His correspondence was extensive, and his attention to public duties exemplary. In the great council of the republic into which he entered in 1752, and in which he had a seat till 1768, he distinguished himself by his manly eloquence in the support of wise and moderate measures, and his constant zeal in the cause of morals and religion, with which, in his opinion, the prosperity of the state was essentially connected. The last 25 years of his life were spent altogether in the country, where he enjoyed, with a competence, the intercourse of chosen friends. Some part of his time was employed in the education of youth, for which office he was admirably qualified. The revisal of his works occupied near eight years of his life, and required a degree of application which was injurious to his health. This collection appeared at Neuchatel, in 9 vols. 4to. or 18 vols. 8vo. and contains, besides the works already mentioned, several smaller pieces in natural history and metaphysics. They are all written in French. Towards the year 1788 he manifested alarming symptoms of a dropsy in the breast; and these became more aggravated in process of time, and occasioned a variety of sufferings which he endured with patience and serenity, till at length he was released by death, May 20, 1793, at the age of 73 years. Public honours were rendered to his remains by his fellow citizens: and his funeral eulogy was pronounced by his illustrious friend and kinsman, M. de Saussure. Mem. pour servir a l'Hist. de la Vie et des ouvrages de M. Charles Bonnet; Berne 1794. Gen. Biog.

Bonnet, Jacques, published, in 1726, at Amsterdam, "Histoire de la music," the history of music and of its effects from its origin to the present time, explaining, in what its beauty consists, 4 vols. 12mo. This history was at first undertaken by the abbé Bourdelot, uncle to the editor of this work, and distinguished by his erudition. Bonnet Bourdelot, brother of Bonnet, the first physician to the duchess of Burgundy, continued it after the death of his uncle, and at length arranged and digested the materials which he found among the MS. papers of his uncle and his brother. Indeed the first volume only was written by Bonnet; the three last were compiled in a patriotic fury by Frencuse, a physician, in 1705, who died in 1707, in the flower of his age, having only arrived at his 33d year. He seems to have been wholly stimulated to this undertaking by the abbé Raguenet's parallel between the music of the Italians and the French; which, though written with the utmost circumspection and civility to France, M. Frencuse thought too favourable to Italy; and instead of a continuation of the history of music, has given us nothing but a violent philippic against the abbé Raguenet, for daring to draw a parallel between the music of France and Italy, and a censure of all the most illustrious Italians of the 17th century, such as Carissimi, Luigi Rossi, Scarlatti, and Corelli; and setting up Lulli against them all, has formed his refutation of the abbé into three dialogues; in which two of the interlocutors are champions for Lulli, and only one, and that a lady, neither a deep logician, nor a powerful advocate for the Italians, is the heroine that undertakes their defence. But the poor Italians have no quarter

ter given them; not only their music and singing, but even their language is censured for its elisions, its metaphors, its similies, construction, and inverted phrases.

The execution of the Italians he compares to the dexterity of the soldier who was brought to Alexander, to exhibit a trick which he had acquired by infinite pains and practice, of chucking a pea into a distant hole which just fitted it. When all the reward which the great conqueror bestowed upon the soldier for his useless application of time was, to order him a peck of peas.

Indeed all the praise that is due to Bonnet for the first part of what he calls a history of music, is, the having collected materials towards a history of the art; but he was no musician, and equally unable to explain the theory of the ancients as the practice of the moderns; so that his work is totally devoid of taste, order, and useful information.

Bonnet, or Bonet, Theophilus, an eminent and respectable practising physician, and voluminous writer in medicine, of Geneva, where he was born, March 5th, 1620. Following in the steps of his father and grandfather, he early attached himself to the practice of physic. After visiting several foreign academies, he was admitted doctor in medicine at Bologna, in 1643, and was soon after made physician to the duke de Longueville. Though he soon attained to high credit in his profession, and had a large share of practice, he dedicated a considerable portion of his time to reading, and to dissecting such subjects as the hospital afforded him, with a view of discovering the seats of the diseases, under which the patient had laboured; minuting every deviation he observed from the natural structure of the viscera, or other parts of the body, and thus opening a new road for improving the science he cultivated. He also appears to have made extracts of every thing he deemed worthy of notice, from the various works he read. His hearing from some accident becoming defective, he withdrew from practice, and employed the last ten or twelve years of his life in arranging the materials he had collected. The first fruit of his labour, which he gave to the public, in 1668, was "Pharos medicorum," 2 vols. 12mo. This was printed again, much improved and enlarged, in 1679, in 4to. under the title of "Labyrinthi medici, extricati," &c. compiled principally from Bellonius and Septalius. In 1675, "Prodromus anatomiæ practicæ, sive de abditis morborum causis," fol.; the precursor of his principal work, "Sepulchretum, seu anatome practica, ex cadaveribus morbo denatis proponens historias et observationes," &c. 2 vols. fol. Genev. 1679, which far exceeded the expectation raised by the prodromus. It was enlarged by nearly a third part, and republished by Manget, 2 vols. fol. 1700, and was afterwards taken by Morgagni, as the basis of his work, "De sedibus, et causis morborum," by which the sepulchretum is in a great measure superseded. The author begins with observations on the appearances of the brain and other parts of the head; then of the contents of the thorax, abdomen, and pelvis; and lastly, of the extremities; forming an immense body of dissections, which he has illustrated by many pertinent and ingenious observations. "Cours de medicine, et de la chirurgie," 2 vols. 4to. 1679. An epitome of the art of surgery, with some sections relating to the practice of medicine, selected from the most accredited authors of the age. "Medicina septentrionalis, collectitia," 2 vols. fol. 1684. shewing how largely the practitioners of the northern parts of Europe, Sweden, Denmark, Germany, Holland, and England, have contributed to the improvement of anatomy, surgery, and medicine, by extracts and accounts of the works of the principal writers of those countries. "Mercurius compilatitius, seu index medico-practicus, decisiones, cautiones, observationes in singulis affectibus, &c. ostendens tutam medendi viam," fol. 1682. A most useful work, shewing under the name of every disease or affection where cases or observations may be found, and what authors have written upon them. Such an index continued to the present time, though very voluminous, would be highly useful. Bonet also published "Epitome operum Sennerti," fol. 1685, and "J. D. Turqueti de Mayerne, de Arthritide," 1671, 12mo. and "Rohaulti tractatus physicus, e Gallico in Latinam versus," 1675, 8vo. He died of a dropsy, March 3, 1689. Hall. Bib. Med.

Bonnet, in a general sense. See Cap, Hat, Mitre, &c.

Bonnet, in *Fortification*, a kind of little ravelin, without a ditch, having a parapet three feet high; anciently placed before the points of the saliant angles of the *glacis*; being palisadoed round; of late also used before the angles of bastions, and the points of ravelins, and fausse-brayes. See *Plate Fortif.*

The bonnet has two faces, from ten to fifteen, or more rods long: the parapet is made of earth, from thirty to thirty-six feet thick, and from nine to twelve feet high; it is environed with a double row of palisadoes ten or twelve paces distant from each other; hath a parapet three feet high, and is like a little advanced *corps du guard.*

Bonnet *à prêtre*, or *priest's cap*, is an outwork, having at the head three saliant angles, and two inwards.

It differs from the *double tenaille* only in this, that its sides, instead of being parallel, grow narrower, or closer at the gorge, and open wider at the front; on which account it is also denominated *queue d'aronde*, or swallow's tail.

Bonnet, in *Geography*, a river of the county of Leitrim, in Ireland, which passes within four miles of Lough Clean, from which the Shannon issues, and carries boats into Lough Gilly, and thence into Sligo bay. Dr. Beaufort observes, that the day may come, when the spirit of enterprise and commerce will open itself a passage by this channel also. Beaufort.

Bonnet, *St.* a town of France, in the department of the Higher Alps, and chief place of a canton, in the district of Gap, 2½ leagues N. of Gap. The place contains 1508, and the canton 10,284 inhabitants; the territory comprehends 245 kiliometres, and 20 communes.

Bonnet *le Chateau*, *St.* a town of France, in the department of the Loire, and chief place of a canton, in the district of Montbrison, 4 leagues S. of Montbrison. The town contains 1506, and the canton 12,945 inhabitants. The extent of the territory includes 192½ kiliometres, and 10 communes.

Bonnet *le Castel*, *St.* a town of France, in the department of the Puy de Dôme; 5 leagues N. E. of Brioude.

Bonnet *de Bruyères*, *St.* a town of France, in the department of the Rhone and Loire, and chief place of a canton, in the district of Villefranche, 6 leagues N. of Villefranche.

Bonnet *de Chavagne*, *St.* a town of France, in the department of the Isere, and chief place of a canton, in the district of St. Marcellin, 1½ league S. W. of St. Marcellin.

Bonnet *de Joux*, *St.* a town of France, in the department of the Sâone and Loire, and chief place of a canton, in the district of Charolles, 2½ leagues N.E. of Charolles. The town contains 1321, and the canton 6140 inhabitants; the territory comprehends 160 kiliometres, and 7 communes.

Bonnet, in *Heraldry*, a cap of velvet worn within a coronet.

Bonnet *pepper*, in *Botany*. See Capsicum annuum.

Bonnet, in *Sea-Language*, an additional part of a sail, laced

laced at the bottom or foot of the fore-ſail, try-ſail, and ſtorm main-ſails, of ſome veſſels with one maſt, in moderate winds. It is made like the foot of the ſail for which it is intended, and has latchings in the upper part, to correſpond with and fall through holes in the foot of the ſail, by which it is faſtened.

The words in reference to it are, *lace on the bonnet*, that is, faſten it to the courſe; *ſhake off the bonnet*, that is, take it off the courſe.

Bonnet *chinois*, in *Conchology*, is the common or trivial name applied by French collectors to the Patella Chinensis, in the ſame manner as we ſhould call it in Engliſh the *Chineſe bonnet*, or limpet ſhell; thus alſo the French *Bonnet de Pologne*, for the Linnæan *Buccinum teſticulus*, &c.

Bonnet *chinois*, in *Zoology*, the French name of Simia Sinica, Gmel. or Chineſe ape of Pennant's ſynopſis, a ſpecies that inhabits the country of Bengal. See Sinica. Obſ The ſame animal is called *Guenon couronée*, by late French writers.

BONNETABLE, in *Geography*, a town of France, in the department of the Sarthe, and chief place of a canton, in the diſtrict of Mamers. The place contains 4587, and the canton 11051 inhabitants; the territory comprehends 105 kiliometres, and 10 communes.

BONNETELLA, in *Entomology*, an European ſpecies of Tinea, deſcribed by Linnæus, in *Fn. Suec.* Fabricius and others. The wings are white, with two little ſilvery lines, the poſterior one of which is waved.

BONNETIA, in *Botany*, (in honour of Charles Bonnet of Geneva,) Schreb. 915. Willden 1050. Mahuria Aublet 222. Juſſ. 434. Encyc. method. Claſs and order, *Polyandria Monogynia*. Nat. Ord. uncertain. Juſſ. Gen. Char. *Cal.* of one leaf deeply divided into five ovate, acute, concave ſegments, two larger than the others. *Cor.* petals five, ovate, ſomewhat obtuſe, concave, longer than the calyx, the three ſuperior ſmaller, upright; two lower larger, inclined, at a diſtance from each other. *Stam.* filaments very numerous, inſerted into the receptacle, ſhorter than the coroll, dilated at the top. Anthers yellow, oblong, tetragonal. *Piſt.* germ ſuperior ſmall, oblong. Style incurved. Stigma hollow, three-lobed. *Pericarp.* capſule dry, membranous, oblong, three-celled, three-valved, valves ſharp pointed. *Seeds* many, ſmall, black, oblong, involved in a coloured membrane, affixed to the three-ſided receptacle.

Eſſ. Char. *Cal.* five-parted, two parts larger. *Cor.* five-petalled, three ſmaller upright, two larger inclining. *Capſ.* oblong, three-celled, three-valved, many-ſeeded.

Species. B. *paluſtris*. Lamark. Illuſt. tab. 464. A tree fifteen feet high, ſeven or eight inches in diameter; branches upright, chiefly towards the top of the trunk; leaves alternate, peticled, ovate, entire, ſmooth; petioles channelled, with two ſmall ſtipules at their baſe; flowers purple, ſpiked, one, two, or three together, furniſhed with three ſcaly bractes, one larger at the baſe of the peduncle, the two others lateral. A native of Cayenne and Guiana.

BONNEVAL, Claude-Alexander, *Count of*, in *Biography*, a deſcendant of an ancient family of Limouſin, was born in 1672, and having entered betimes into the army, ſerved with diſtinction in Italy under Catinat and Vendome. Abandoning his country in 1706, and entering into the ſervice of the emperor, a ſentence was procured againſt him by the miniſter Chamillart, which ſubjected him to decapitation. Notwithſtanding this proſcription, he ventured to Paris, and publicly married a lady of the family of Biron. In 1716 he ſerved againſt the Turks under prince Eugene, and was a major at the battle of Peter-Waradin, where he behaved with ſingular valour; but in 1720 he had a diſpute with prince Eugène, and challenged him, for which offence he was deprived of his employment, and condemned to a year's impriſonment. Upon regaining his liberty he meditated revenge, went over into Turkey, became a muſſulman, and was created a baſhaw of three tails, general of artillery, and at laſt maſter of the ordnance. In this ſituation he introduced European improvements among the Turks, and lived much eſteemed to the age of 75 years. He left a ſon, who ſucceeded him in the office. He was a man of quick parts, courage, and ability; but ſingular in his conduct, quarrelſome in his diſpoſition, and addicted to ſatire. Upon changing his religion, he ſaid, "It was only changing his night-cap for a turban." With all his eccentricities he preſerved a calm temper; and ſaid, "In all my perſecutions I never loſt my appetite or good humour. Happy thoſe who have philoſophy in their blood!" His "True Memoirs," and his "New Romantic Memoirs," were publiſhed in London, in 1755. Nouv. Dict. Hiſt.

Bonneval, in *Geography*, a town of France, in the department of the Eure and Loire, and chief place of a canton, in the diſtrict of Chateaudun, ſeated on the Loire. The place contains 1551, and the canton 10,638 inhabitants; the territory comprehends 337½ kilometres, and 27 communes.

BONNEVILLE, a town of Savoy, the chief place of a diſtrict in the department of Leman, and before the French revolution, the capital of Faucigny, ſeated on the banks of the Arve, at the bottom of a chain of rocks, which from this place diminiſh into hills. The adjacent country is a rich plain, producing plenty of wine and corn, but neither populous nor well cultivated. The place contains 990, and the canton 9286 inhabitants; the territory comprehends 165 kiliometres, and 15 communes. N. lat. 46° 11′ E. long. 6° 15′.

Bonneville-*des-Bouchoux*. See Bouchoux.

BONNIERES, a town of France, in the department of the Seine and Oiſe, and chief place of a canton in the diſtrict of Mantes; the place contains 769, and the canton 11,984 inhabitants; the territory comprehends 207½ kiliometres and 27 communes.

BONNY, a town of France, in the department of the Loiret, and chief place of a canton in the diſtrict of Gien; containing about 1300 inhabitants; 3 leagues S.S.E. of Gien.

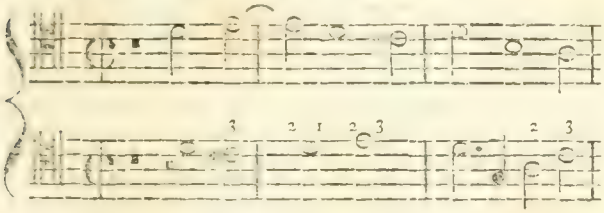
Bonny, a river of North Africa, which forms the æſtuary of New Calabar, in the kingdom of Benin, diſcharging itſelf into the bay of Biafra. N. lat. 4° 40′. E. long. 6° 30′.

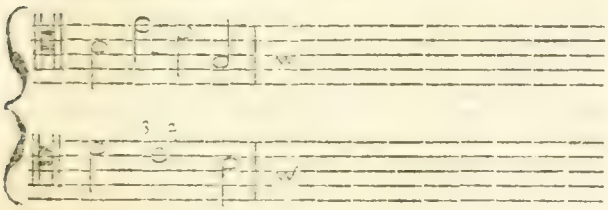
Bonny, in *Mineralogy*, a name given by our miners to a bed of ore found in many places in hills, not forming a vein, nor communicating with any other vein, nor terminating in ſtrings, as the true veins do; it is a bed of ore of five or ſix fathoms deep, and two, or ſomewhat leſs than that, in thickneſs, in the larger ſort; but there are ſmaller, to thoſe of a foot long. They have their trains of ſhoad-ſtones from them, and often deceive the miners from the expectation of a rich lead vein. They differ from the ſquatts only in being round beds of ore, whereas thoſe are flat. Phil. Tranſ. N° 69. p. 2098.

BONO *et malo, Writ, de*, in *Law*, a ſpecial writ of gaol-delivery was anciently uſed for each particular priſoner under this title: but theſe being found inconvenient and oppreſſive, a general commiſſion for all the priſoners has long been eſtabliſhed in their ſtead. 2 Inſt. 43.

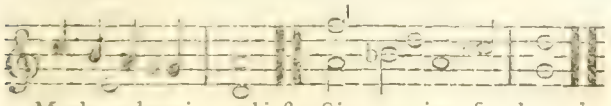
BONONCINI, Gio. Maria, in *Biography*, Modaneſe Accademico Filarmonico di Bologna, and father of the celebrated John and Anthony Bononcini, publiſhed in 1673, a

work entitled "Il Musico Practico," or the Practical Musician, dedicated to the emperor Leopold, in thin quarto. This treatise contains many useful precepts and examples of composition; but is neither so accurate as to be implicitly followed, nor so ample as to supply all the wants of a musical student of the present times. Page 18, he speaks of a canon, in his opera terza, for fifteen hundred and ninety-two voices, or six hundred and forty-eight choirs; which, on account of the difficulty of finding such a number of singers, assembled together, he has reduced to twenty-two. In the historical part of this tract, his knowledge is not very profound, or reading extensive; and the authors he cites, in support of his information, give it no additional weight. The examples he has given of the use of the second, page 64, are, in many instances, erroneous, and such as can be found in the works of no good contrapuntist of the last century. The second is not only confounded with the ninth by this author, page 64, but improperly prepared and resolved.





This discord of the second seems to require one of the parts to remain stationary, till the suspended harmony is completed; but Bononcini often puts both parts in motion. In his example of counterpoint upon a plain song, page 76, there are other disallowances.



Much explanation and instruction are given for the ecclesiastical modes, but none of the keys, used in secular music, are defined or ascertained.

Bononcini, John, the celebrated opera composer and rival of Handel, was the son of Gio. Maria Bononcini, of Bologna, the subject of the preceding article. He first arrived in England in 1720, on the establishment of our famous "Corporation of the Royal Academy of Music," under the auspices of king George I. and the principal nobility and gentry in the kingdom; for the support of which 50,000l. were subscribed. We have now before us the original deed and covenant, with the seal and sign manual of all the subscribers, who became academicians, and bound themselves and their respective executors, administrators and assigns, to pay all such respective sum or sums as shall from time to time be demanded out of their subscription, &c. The king subscribed 1000l. and the rest, to the number of 73, in this original list, 200l. each.

It is a curious record to be in possession of the autography of such a number of the heads of our most ancient and illustrious families thus preserved. It is not, indeed, equally important or honourable with the list of the barons who signed the Magna Charta; but it is such a memorial of our prosperity, good-humour, patronage of a polite art, and happiness, that we would give a fac-simile of each signature on a copper-plate, if we had room.

In order to render this academy as complete as possible, it was determined by the directors not only to engage a lyric poet in their service, but the best vocal performers that could be found in the several parts of Europe where there was a musical theatre, and the three most eminent composers then living who could be prevailed upon to visit this country. For this purpose Bononcini was invited from Rome, as he tells us himself, in the dedication of his Cantatas and Duets to George I. (Qui mi trovo, chiamata da Roma per servigio della real Accademia di Musica). Attilio Ariosti, from Berlin, was likewise engaged as a composer on this occasion; and Handel, who resided at this time with the duke of Chandos, at Cannons, was not only included in the triumvirate, but commissioned to engage the singers.

During the first year of this establishment, these three composers furnished new operas alternately, till January 1721, when, for dispatch, an act of the opera of Muzio Scavola was assigned to each of these masters; the first act to Attilio, probably from seniority, as he was far from young when he came hither; the second act to Bononcini, at that time about 50; and the third to Handel, the youngest of the three.

As this division of the drama seemed to imply a contention and trial of skill, the public took sides, perhaps less from feeling than the spirit of party; for party whets our appetites for pleasure as well as politics. Many of the nobility and gentry, who had been in Italy, and had witnessed the applause which Bononcini had received there as a composer, were partial to him here. While others who had visited the court of Hanover before the decease of queen Anne, and knew the favour in which Handel had stood with the elector, as a great performer on the organ and harpsichord, before his compositions were much known, and afterwards had heard his productons performed in London, were unwilling to be pleased with the compositions of his principal rival. Attilio, though a good musician, seems to have been out of the question; neither his fame nor talents being equally splendid with those of the other two, by whom, and for whom, the conflict continued with as great a rage as between the houses of York and Lancaster, till the year 1727; when Bononcini, after the run of the last and best opera which he had composed in England, "Astyanax," quitted the contest with Handel, and ceased to write for the stage. But the feuds among the friends of these great musicians, which Swift's epigram had rendered so risible, did not end here, but continued as long as Bononcini remained in this country.

Here, as his biographer, it seems our duty to give his real character as a composer. He was seldom heard on the violoncello in this country, though as a performer on that instrument he was extremely admired in Italy; and his melody was, perhaps, more polished and vocal, though not so new as that of his powerful Saxon rival. Having been born and nursed in Italy, where singing was so highly cultivated, he was reported by all his countrymen to sing in a most exquisite taste. His recitative too, both in writing and utterance, was universally allowed to be the best of the time, and in the true genius of the Italian language; but as a correct, powerful, and inventive composer, he was an infant compared with Handel.

Of all the works which this celebrated composer published in England, his book of "Cantate e Duetti," dedicated to his

his majesty George I. in 1721, the year after his arrival here, seems the best. In 1722, his "Divertimenti da Camera, tradotti (transposed or accommodated) pel Cembalo da quelli compositi pel Violino e Flauto," were published by himself, and sold at his lodgings in Suffolk-street. In these we meet with pleasing and masterly passages, but they are so inferior in force, contrivance, and invention, to the lessons of Handel, that even his admirers, on a comparative view, must have regarded them as frivolous and trivial. The *adagios* are the best movements in them, and have notes of taste and passages of expression, which must have been then new to English ears. Bononcini, however, like other composers of his time, is very sparing of his passages, and indulges idleness and want of invention by frequent *rosalias*, or repetitions; which Handel seems always to avoid more than any composer of this period, except the Scarlattis, father and son. In several of these lessons the subject is heard in one part or other throughout a whole movement; as in the minuet, page 35, the first bar is perpetual.

His funeral anthem for the duke of Marlborough was set and performed the same year, 1722. The short symphony, and whole first movement are grand, and of a melancholy cast. The second movement has not much to recommend it. The third is more languid, than passionate or pathetic. The fourth is plaintive, but was not new at the time it was written. The fifth and last movement has musical merit, but none of true feeling, or genius; no "heart-rending sighs," or such exclamations of sorrow and affliction as would naturally be expected from a man of great abilities, who either felt the words or the loss of his patron.

Bononcini was a celebrated and voluminous composer long before he arrived in England: his eighth work, consisting of "Duetti da Camera," was dedicated to the emperor Leopold, and published at Bologna in 1691. The seven operas he composed during his residence in England, make but a small part of his dramatic productions. He produced two operas at Rome in 1694; after this he went to Vienna, where he composed many operas and oratorios for the imperial court and chapel. In 1720, he was again in high reputation as a dramatic composer at Rome, whence he was invited to London by the directors of the Royal Academy of Music. In 1732, he published "Twelve Sonatas for two Violins and a Base." It was about this time that he was accused of arrogating to himself a madrigal composed by Lotti of Venice, and published in that city in 1705, in a work entitled "Duetti, Terzetti, e Madrigali a più Voci," dedicated to the emperor Joseph. The title of the madrigal is "La vita caduca," and has for initial line "In una siepe ombrosa." We are in possession of the book in which this composition was printed, and, upon examination, are extremely astonished that Bononcini would risk the great reputation of which he was already in possession, for a production which could increase it so little. The counterpoint of this madrigal is certainly correct, but it is dry, and all the subjects of fugue are such as had been used by thousands before Lotti was born. There are many madrigals by much older masters, particularly Luca Marenzio, Stradella, and the elder Scarlatti, that are learned and pleasing in modulation, and more fanciful and agreeable in the traits of melody that are used as subjects of imitation. Indeed, Bononcini's plagiarism was as weak as wicked. We used to doubt the truth of the charge, from an idea that his reputation was so well established, and his genius so fertile, that he had not the least occasion to have recourse to such illicit means of extending it. The crime of theft is very much aggravated, when the thief is not impelled to it by want. Rich men and misers have, however, been often detected in illegal appropriation. Yet upon a careful and critical examination of the works of John Bononcini, we think his wealth did not consist in rich and deep mines of science, nor were his resources in learned and elaborate composition, either in the ecclesiastical or madrigal style, very great. His performance on the violoncello, his cantatas, and his operas, had been admired in every part of Europe; but not content with partial fame, he aimed at universality. In his anthem for the funeral of the duke of Marlborough, he attempted to rival Handel in his grand church style; and finding in how much veneration well written madrigals were held at the Academy of Ancient Music in London, where Handel at this time was regarded as a modern, and an innovator, he was tempted to risk the reputation he had fairly acquired, by trying to augment it in an illegal manner. Tradition had filled our minds with ideas of his abilities, which the examination of his works has diminished; while a strict scrutiny into the productions of Handel has greatly augmented our veneration for that composer. We have now before us, in a printed pamphlet, all the letters that passed between the secretary of the Academy of Ancient Music and signor Ant. Lotti on this occasion, with such testimonies and certificates, from the most respectable professors at Venice and Vienna, in proof of the madrigal in dispute having been composed by that master and not by Bononcini, that not the least doubt remains of the fact.

Soon after the funeral of the duke of Marlborough, the countess of Godolphin, who, upon the decease of her father, became duchess of Marlborough, as settled in his patent of creation, received Bononcini into her house in the Stable-yard, St. James's, and settled on him a pension of 500l. a year. Here he lived in ease and affluence, enjoying as an artist the *otium cum dignitate* in its full extent; the duchess having concerts twice a week, in which no other music was performed to the first people in the kingdom than the compositions of her favourite master, executed by the principal singers of the opera. It is supposed that he gained a 1000l. by the book of cantatas which he published by a two-guinea subscription; many of the nobility subscribing for five or ten copies; the duke and duchess of Queensbury for twenty-five books each, and the countess of Sunderland alone for fifty. After the dispute concerning this madrigal, his importance and reputation diminished considerably; and about the year 1733 he quitted the kingdom. After which he resided at Paris for several years, where he composed masses and motets for the chapel royal. At the conclusion of the peace of Aix la Chapelle in 1748, he was invited to Vienna by the emperor of Germany to compose the music for that occasion, and is said to have been presented with eight hundred ducats for his trouble. After the celebration of the peace was over, quitting Vienna in company with Monticelli, he set off in the same post-chaise with this celebrated singer for Venice, where they were both engaged, Bononcini as composer, and Monticelli as first man, in the operas for the ensuing Carnaval in that city. Here we lose sight of this renowned composer, who if we suppose him to have been no more than thirty years of age in 1691, when his eighth work was printed at Bologna, and dedicated to the emperor Leopold, he must at this time have attained his eighty-seventh year; which will give weight to the general opinion, that his life was extended to near a century!

Bononcini, Antonio, brother of John, and an opera composer, little less renowned in Italy, than the author of *Griselda* and *Astyanax*. It has always been imagined that the famous opera of *Camilla*, the second attempt at that species of drama in England, in 1706, was set by John Bononcini; but we can find no proof of it in any one of the numerous volumes of operas in our possession, or dramatic records

records that we have been able to consult. "Camilla Regina de Volsci," written by Stampiglia, and set by Marc Antonio Bononcini, the brother of John, for the imperial court of Vienna, about the year 1697, was in such favour all over Italy, that it was performed at Venice, 1698; Bologna, 1705; Ferrara, and Padua, 1707; Bologna again, 1709; Udine, 1715; and a third time at Bologna, 1719; and seems to have been the opera that was performed in England, during 1706, fifteen times; 1707, twenty; 1708, ten; and 1709, eighteen; in all sixty-four times!

BONONIA, in *Ancient Geography*, a town of Gallia Cispadana, called Felsina, at the time when the Etruscans were masters of the northern part of Italy, and then their capital; supposed by some to have been founded by an Etruscan prince, denominated Felsinus. But when these first possessors were driven away by the Boians, it acquired the name of Bononia. In the year of Rome 564, the Romans conducted a colony to this place, with a view of fortifying this side of the country. It afterwards became a municipal city; and owed much of its magnificence to Augustus. See Bologna.—Also, a town of Upper Pannonia, placed by Ptolemy on the Drave.—Also, a town of Dacia Ripensis. Not. Imp.—Also, a town of Upper Mœsia, in the route from Viminiacum to Nicomedia, between Dorticon and Ratiaria. It. Antonin.—Also, a town of Lower Pannonia, in the route along the Danube, between Cusi and Cucci, 19 miles from Sirmium, according to Ammianus Marcellinus.

BONONIAN Stone, a small, grey, soft, glossy, fibrous, ponderous, sulphureous stone, about the bigness of a large walnut, or even of an orange; when broken, having a kind of crystal, or sparry talc within; found in the neighbourhood of Bologna, or Bononia, in Italy; and, when duly prepared, making a species of phosphorus. It is of no certain figure; but is sometimes round, sometimes oblong and cylindric, and sometimes denticular, which last kind is said to be the most shining and transparent. Its colours are various; some being ash-coloured, others of a sky-blue, some of a ferruginous colour, others yellow, others greyish white, and some almost perfectly white. The best for use are said to be the sky-coloured and the white. This stone is found in several parts of Italy, but especially in the district of Bologna, towards the Apennine mountains, and on mount Paterno, or Paterno, about five Italian miles from Bologna. They are most commonly found after heavy rains, among the earth washed off from the neighbouring mountains. In this case the several masses of it appear, when the earth is washed away, as bright as burnished silver, or with the glittering of talc resembling the gloss of a looking-glass. This stone is the ponderous spar, or combination of vitriolic acid with ponderous earth. See Spar.

A chemist, whose name was Vincenzo Casciarolo, having gathered some pieces in a river at the foot of mount Paterno, carried them home, in hopes by the fire to draw silver out of them; but instead of what he expected, found that admirable phenomenon they exhibit, which consists in this, that having been exposed to the light, they retain it, and shine in the dark. This discovery was made about the year 1630.

The property of this stone is, that though it has no lucid appearance in the dark, until it undergoes a particular calcination, it becomes capable, by previous preparation, of imbibing, when exposed for a few minutes to the light of day, or even to the flame of a candle, such a quantity of light, that it afterwards shines in the dark for an interval from eight to fifteen minutes, like a glowing coal, but without any sensible heat. The light it emits is sufficient to read by, if the letters be placed near it. It does not retain its light long, but requires often renewing; and when well prepared, its virtue will last five or six years, but seldom longer. The method of using it to the greatest advantage, is to remain for some time in a dark room, and to introduce the calcined substance immediately after its being exposed to the light.

M. Homberg is said to be the first person who taught us the true manner of preparing and calcining the Bononian stone, having made a journey to Italy on purpose to learn it. Though others allege, that the true art of preparing and calcining the stone is lost; there having been but one, an ecclesiastic, who had the true secret, and who is since dead, without communicating it to any person. See Phil. Transf N° 21.

M. Homberg, on his return from his travels in Italy, brought with him a great number of these stones, and calcined 200 of them in so many different ways, that he at last found out the secret. His method was as follows:—He first scraped the stone all over, till it appeared like talc; then, having soaked it thoroughly in brandy, and inclosed it in a paste or crust made of other stones of the same kind pulverized, he calcined it in the fire, or a small furnace. After this operation, he took off all the powder of the crust in which the stone was inclosed. Both the powder and the stone, when brought into the dark from the open air, make a luminous appearance; and the former, if kept in a strong and well-stopped phial, when exposed to the air, imbibes the light, and if sprinkled on pictures and letters, illuminates them in the dark. In preparing the paste, the stone must be pulverized in a brass mortar. This circumstance is mentioned by Lemery, who, in his "Cours de Chymie," describes at large the whole process of preparing this stone, which he acknowledges to have learnt from Homberg himself.

The whole art of preparing this stone, so as to make it shine in the dark, is described at large in Hook's "Philosophical Collections," by sir Marc Antonio Cellio; and in a book of the same author, published at Rome in 1640, on this subject: and the substance has hence been called "Il Fosforo de Marc Anton. Cellio."

The following has been stated as an approved method of calcining this stone. Make a cylindric furnace of iron or copper plates, 7 inches in diameter, and as many in height. Line the inside of it with a strong lute, so that the inside may be 6 inches wide in the clear hollow; at the top of this make four notches, $2\frac{1}{4}$ inches deep, and $1\frac{1}{2}$ inch wide; to this annex a cylindrical part of the same diameter, but a little higher; and at the bottom make two ash-holes, or air-holes, big enough to admit the hand. Line this, like the other, with good lute, and give it a bottom of lute, that it may more powerfully reflect the heat; and line the cover for the top with lute. Into this furnace introduce an iron-wire grate near the bottom, for sustaining the coals, and so as to admit of free access of air. On this grate lay some pieces of lighted charcoal; and over these some pieces not lighted; all bruised to the size of about a walnut. Some of the stones must be powdered, and those which are to be calcined must be dipped in strong aqua vitæ, and while wet rolled in the powder, or the powder itself may be made up into thin cakes with mucilage of gum tragacanth. The stones, thus covered, or the cakes, must be laid upon the bed of charcoal close to one another, and another bed of small pieces of charcoal laid over them to the top of the furnace; the cover of the furnace is then to be put on, and the fire lighted. When the charcoal is entirely consumed, and the whole is cold, take out the stones, and, separating the crust from them, wrap them up in silk or cotton, and keep them close in a box for use. Preserve the crust taken off the stones;

for this ſhines as well as the ſtone; and being pulverized, may be rubbed over any ſurface for emitting light, the ſurface being firſt daubed over with the white of an egg in order to make it adhere; and this will ſhine like the ſtone. This kind of furnace is not abſolutely neceſſary to the operation; but it is convenient to know the quantity of charcoal requiſite for giving the ſhining quality to the ſtone; ſince an exceſs of heat deſtroys it, and too ſmall a degree is not ſufficient to produce it. The greateſt degree of phoſphorence ſeems to depend on a due application of the heat. An extreme degree of heat fuſes the ſtone. For other methods of preparing this kind of phoſphorus, ſee PHOSPHORUS. See alſo LIGHT.

This property of affording a phoſphorus by calcination, is common to the other gypſums, when pure from metallic or other heterogeneous mixtures; the artificial gypſums ſucceed equally with the natural, and it is found to belong to a variety of other ſubſtances. M. Margraaf obſerves, that all ſubſtances which have this property contain a vitriolic acid, united to an alkaline or calcareous earth.

M. Elpigni obſerves, that one Zagonius had a method of making ſtatues and pictures of the Bononian ſtone, which would ſhine variouſly in the dark; but he adds, the perſon died without diſcovering his ſecret. See Phil. Tranſ. N° 134.

BONONIENSIS, in *Ornithology*, the ſpecific name of the greater lapwing, *tringa bononienſis* of Gmelin, and *vanellus bononienſis major* of Briſſon. The legs of this kind are ochraceous; head and upper part of the neck cheſnut; body above black, beneath white; throat and breaſt ſpotted with ferruginous. Gmel. *Obſ.* This is larger than the common lapwing (*tringa vanellus*); the beak is yellowiſh and black at the tip.

BONONIENSIS, *paſſerculus bononienſis* of Briſſon. This is *fringilla brachyura* of Gmelin, or ſhort-tailed ſparrow.

BONOSIANI, or BONOSIACI, in *Eccleſiaſtical Hiſtory*, an ancient branch of ADOPTIANI, in the fourth century, denominated from their leader Bonoſus, a biſhop of Macedonia.

BONPLANDIA, in *Botany*. Cavan. 532. Claſs and order, *Pentandria Monogynia*.

Gen. Char. *Cal.* tubular, five-toothed. *Cor.* monopetalous, almoſt labiate; tube longer than the calyx; border with fine emarginate diviſions; the two ſuperior long and ſtraight, the three inferior pendant. *Stam.* five inclining. *Piſt.* germ ſuperior; ſtyle capillary; ſtigma bifid; *Pericarp*, capſule ovate, three-ſided; cells three; ſeeds three.

Species, B. *geminiflora*, an annual plant; leaves alternate, ſmooth, lanceolate, toothed; flowers violet, large, axillary, growing in pairs. A native of New Spain.

BONPOURNIKEL, a denomination given to a coarſe kind of bread uſed in Weſtphalia. See BREAD.

BONS-HOMMES, or BON-*Hommes*, in *Eccleſiaſtical Hiſtory*, a ſort of hermits of St. Auguſtin, founded by F. de Paula. They were brought over into England in 1283, by Edmund, earl of Cornwall, and ſettled at Aſhorng, in Bucks, beſides which they had only one houſe more at Edington in Wiltſhire. They followed the rule of St. Auſtin, and wore a blue habit.

The name is ſaid to have ariſen from Louis XI. of France, who uſed to call F. de Paula, prior of the order, *le bon homme*. Till then they had been called the *Minimi*, or order of Grammont. See ALBIGENSES.

BONSDORFII, in *Entomology*, a ſpecies of CURCULIO, of an oblong form. Colour white, with a black band and ſpots; ſnout ſulcated and brown. Bonſd. Curc. Suec. Inhabits Sweden, and is half the ſize of *curculio ſulcirostris*.

BONTAIN, in *Geography*, a kingdom of the iſland of Celebes, ſituate on the ſouth coaſt, and on the eaſt ſhore of the bay of Boni. It is bounded on the weſt by the river Tino, which divides it from the kingdom of Tourattea; on the north, by the mountains which bear its own name; on the eaſt, by the river Kalekongang; and on the ſouth by the ſea. It was anciently conſidered among the dependent allies of Macaſſer, and governed by their kings; but it has been twice conquered by the arms of the Dutch Eaſt India company and their allies, and was ceded to them, in property, by the treaty of Boni. The country is pleaſant, and fertile in rice. It has a large bay, where ſhips may lie in perfect ſafety during both the monſoons. The ſoundings are good and regular, and the bottom ſoft mud; nor is there any danger in coming in, except from a ridge of rocks, which are above water, and are a good mark for anchoring. The higheſt land in ſight is called "Bontain-hill." S. lat. 5° 30'; and when a ſhip is in the offing, at the diſtance of 2 or 3 miles from the land, ſhe ſhould bring this hill N. or N½W., and then run in with it and anchor. In this bay there are ſeveral ſmall towns; that which is called "Bontain," lies in the N.E. part of it (S. lat. 5° 10'. E. long. 117° 28'.); and here is a ſmall paliſadoed fort, on which are mounted eight guns, that carry a ball of about eight pounds weight; it is juſt ſufficient to keep the country people in ſubjection, and is intended for no other purpoſe; it lies on the ſouth ſide of a ſmall river, and there is water for a ſhip to come cloſe to it. Wood and water are to be procured here in great plenty; likewiſe plenty of freſh proviſions, at a reaſonable rate: the beef is excellent, but it would not be eaſy to procure enough of it for a ſquadron. Rice may be had in any quantity, and alſo fowls and fruit: in the woods there are herds of wild hogs, which may be purchaſed at a low price, as the natives, who are Mahometans, never eat them; and fiſh may be caught with the ſeine. The tides are very irregular; it is commonly but once high and once low water in 24 hours, and there is ſeldom a difference of ſix feet between them. The inhabitants of Bontain, and thoſe of Boele-Comba and Bera, are the beſt humoured, moſt peaceful and moſt tractable of all the ſubjects belonging to the Dutch company, in the whole iſland of Celebes.

BONTEMPI, ANGELINI, in *Biography*, a native of Perugia, and author of the firſt hiſtory of muſic in the Italian language with which we are acquainted. He was an able profeſſor, of conſiderable learning, who flouriſhed about the middle of the 17th century. His work, which has for title "Hiſtoria Muſica di Gio. And. Angelini Bontempi," was publiſhed at Perugia, in ſmall folio, 1695. It is become ſomewhat ſcarce, which enhances its value with collectors of books; and having being long unable to procure a copy, we imagined when one was found, from Broſſard's character of the work, that we were in poſſeſſion of a greater treaſure than on examination it proved to be. For with great parade of his learning, ſcience, and acquaintance with the Greek *theoriſts*, that are come down to us, he leaves us in as utter darkneſs concerning the *practice* of ancient muſic as ever; and, to ſay the truth, he has furniſhed us with but little information concerning the modern of his own time, with which, however, as a contrapuntiſt, he ſeems to have been perfectly well acquainted. Indeed, by the frequent uſe he makes of ſcientific terms, his book, when caſually opened, has more the appearance of a dry mathematical treatiſe, than the hiſtory of an elegant art.

The moſt curious and intereſting part of his work, is the account which he gives of the diſcipline of the college of ſingers in the ſervice of the pontifical chapel, and of the great maſters who then flouriſhed at Rome, who had diſtinguiſhed

guished themselves in writing "Alla Palestrina" for the church; secular music was then but little cultivated, and less respected there, till operas and oratorios had made some progress in polishing melody, and in the just accentuation and expression of words.

BONTIA, in *Botany*, (in honour of Jacobus Bontius, a physician at Batavia, author of a treatise "De Medicina Indorum"). Linn. species 800. Syst. 579. Reich. 3. 200. Willden. 1208. Schreb. 1062. Jussieu 127. Class and order, *Didynamia Angiospermia*. Nat. Ord. *Personatæ*—allied to the *Solaneæ*. Juss.

Gen. Char. *Per.* calyx one-leaved, five-parted; segments obtuse, erect, permanent. *Cor.* one-petalled, ringent; tube long, cylindric; border gaping; upper lip erect, reflexed near the end, emarginate; lower semitrifid, the size of the upper. *Stam.* filaments subulate, bending to the upper lip, the length of the corolla; anthers simple. *Pist.* germ ovate; style simple; stigma bifid, obtuse. *Pericarp.* drupe ovate, with an oblique apex. *Seed*, nut oval, one-celled, germinating.

Ess. Char. *Cal.* five-parted. *Cor.* two-lipped; lower lip three-parted, revolute. *Drupe* ovate, one-seeded, with an oblique apex.

Species, B. *daphnoides*, Barbadoes wild olive. (La Marck Illust. Tab. 546.) "Leaves alternate; peduncles one-flowered." Linn. A shrub four or five feet high; leaves rather stiff, lanceolate, smooth, green on both sides, lower ones serrate, upper ones entire. *Flowers* yellowish, with a line of dusky purple across the lower lip; axillary single, or in pairs; tube and lower lip hairy. It was cultivated by Mr. Bentick in 1690, and flowered with Dr. Sherard in June 1723.

Propagation and Culture. It is cultivated in Barbadoes for making hedges, and may be raised in England from seeds sown on a hot-bed early in the spring. It must afterwards be transplanted into a small pot filled with light earth, and plunged into a moderate tanner's bark hot-bed, with a large allowance of air and water in hot weather, but should always remain in the stove. It may also be propagated by cuttings in the summer. Being ever green, and growing in a pyramidal form, it makes a pretty variety in the stove.

BONTIA, (Brown Jamaic.) See AVICENNIA *germinans*.

BONTIA, (Pet.). See EPIDENDRON *carinatum*.

BONTIA, in *Conchology*, a species of HELIX, of which several varieties are described by Chemnitz. This shell is somewhat conic, ventricose, perforated, and pellucid, with the tip black; on the first whorl three yellowish bands; aperture ovate. *Helix bontia* is a native of Bengal; the shell is extremely fragile.

BONTIUS, JAMES, in *Biography*, a native of Leyden, was educated in philosophy and medicine, under his father Gerard; and being sent to the East Indies, practised physic at Batavia about the middle of the seventeenth century. On his return to Europe he wrote several valuable works on the diseases and practice of medicine of India. These are, "De conservanda valetudine, ac dieta sanis in India observandis;" "Methodus medendi, quâ oportet in India orientali uti;" "Observationes selectæ ex dissectione cadaverum ac autopsia descriptæ." He also published curious observations relating to the botany and natural history of those regions, more especially the vegetables used in medicine and diet in his work entitled "De Medicina Indorum," in 1642, and afterwards, with Alpinus's work "De Medicina Ægyptiorum," 4to. 1718. He also published "Historia Nat. et Med. Indiæ orientalis," fol. in 1658. His brother Regnier was many years professor of medicine at Leyden, and rector of the university. He died in 1623. Haller. Bib. Med. Pract. et Botan.

BONTORY, in *Geography*, a town of Poland, in the palatinate of Braclaw, 20 miles east of Braclaw.

BONVINCINO, ALESSANDRO, called *Le Moretto*, in *Biography*, an eminent painter of history and protrait, was born at Rovate in 1514, and studied for some years under Titian, but he was enamoured with the designs of Raphael, which he accidentally saw; and devoting himself to the assiduous study of those master-pieces of art and genius, he became an exceeding good painter. His works are eagerly bought, and much admired for the tenderness of the pencilling, the correctness and spirited expression of the figures, the neatness of the finishing, and the rich variety of the draperies, consisting of velvets, damasks, or satins, copied after nature, and wonderfully imitated. He was equally excellent in portrait, and placed by some persons in competition with Titian. He died in 1564. Pilkington.

BONUS HENRICUS, in *Botany*, (Bauh. &c.) See CHENOPODIUM.

BONZES, or BONZUS, a name given to the priests and religious of China, Japan, and Tonquin. This is the appellation under which the priests, who are attached to the worship of Fo (see Fo,) are generally known among Europeans. They are called "Talapoins" by the Siamese, "Lamas" by the Tartars, "Ho-shang" in China, and "Bonzes" in Japan. They generally live in a sort of community, in places apart, or consigned wholly to them. The island Pou-to, near Chusan, is a famous seat of bonzes, being wholly inhabited by them, to the number of 3000, all of the sect of Hoshang, or unmarried bonzes.

They live a kind of Pythagorean life, and have not less than four hundred pagodas, or temples, in this little island. They have also females, called bonzesses, a sort of nuns, who dedicate themselves to the worship and service of some temples or idols. They are obliged to abstain from all converse with men, and on that account are cloistered in large monasteries, like those of the Romish and Greek church. For incontinency these bonzesses are condemned by the mandarins to a kind of pillory called *Ranghi*, which see.

These bonzes, or Chinese priests of Fo, worship him under the forms of several animals, through which they pretend that he had transmigrated before he was deified; and ingrossing the worship of this imaginary deity to themselves, in the Chinese temples, they support and propagate it, with a view to their own personal emolument and influence, by the most unwarrantable impostures. They admit, however, the distinction between good and evil; and they declare, that, after death, rewards will be bestowed on the good, and punishments inflicted on the wicked, in places destined for the souls of each. They teach, that the god Fo appeared on earth for the purpose of saving mankind, and of restoring to the paths of salvation those who have strayed; that it is by him their sins are expiated; and that he alone can procure for them a happy regeneration in a future life. They enjoin the strict observance of five precepts; of which the first forbids the killing of any living creature, of whatever nature it may be; the second, the taking away of the goods of another; the third forbids men to pollute themselves by uncleanness; the fourth, to lye; and the fifth to drink wine. They, above all, recommend the practice of certain acts of mercy; such as, treating their bonzes well, building monasteries and temples for them, and supplying them with every thing necessary for their maintenance, as the most effectual means of participating the benefit of their prayers, mortifications, penances, and other meritorious actions, towards the atonement of their own sins, and for obtaining a happy transmigration in another life. On the other hand, they terrify those who withhold their benefactions from them with menaces; assuring them, that they shall

ſhall hereafter revive in the form of dogs, rats, ſerpents, horſes, and mules; and that they ſhall be for ever expoſed to the moſt degrading and wretched tranſmigrations. Theſe menaces ſeldom fail of making a deep impreſſion on the minds of the credulous vulgar, inſomuch that they often perſuade them to burn, at the funerals of their deceaſed relatives, paper gilt, or waſhed with ſilver, ſilk, cloth, and other garments, which, they pretend, will be converted into ſubſtantial gold and ſilver, and ſuperb veſtments, for the uſe of their parents and friends. Le Compte relates a ſtory of an old man, who was led to believe, by the repreſentations of theſe bonzes, that his ſoul ſhould paſs into the body of one of the emperor's poſt horſes. The poor man was ſo diſtreſſed, that he could neither eat nor ſleep, and his grief was ſuch as to threaten the ſpeedy termiſation of his life. He learned, however, that the ſouls of the Chriſtians were exempted from theſe dreadful metamorphoſes; upon which, he applied to one of the Jeſuits for Chriſtian baptiſm, aſſuring him, that he would rather be of that, or any religion, than tranſmigrate into a poſt-horſe. The Jeſuit complied with his requeſt, and made his mind eaſy. Theſe bonzes are perfectly acquainted with all the arts of hypocriſy and deceit; and dextrouſly practiſe them as occaſions occur. They addict themſelves to rigorous faſting, frequent watchings, and long prayers before the altars of Fo. When they cannot obtain gifts by cunning and addreſs, they endeavour to procure them by exciting compaſſion, and by ſubmitting to the ſevereſt penances, and practiſing the moſt rigorous auſterities. With this view they often appear in public places, as frightful ſpectacles of mortification. They often drag along the ſtreets heavy chains faſtened round their necks, arms, and legs: they beat their heads againſt the ſtones and poſts, and mangle their bodies, ſo that they are ſmeared with blood; they carry burning coals upon the tops of their naked heads; and ſome of them are carried about in a kind of ſedan, the inſide of which is ſtuck full of nails and ſpikes, ſo that they cannot ſtir without wounding themſelves; and theſe nails they ſell to the populace for a few pence, as amulets and preſervatives againſt all harm, and as efficacious means of bringing down bleſſings on the purchaſer and his family. By pretending to know the preſent ſtate of the dead, and the future condition of the living, they contrive to extort money from the ſurviving friends, in order to procure for the deceaſed a ſpeedy releaſe and paſſage into a better ſtate. Many other inſtances of their knavery are related by Du Halde, Le Compte, and other writers. Some of theſe are ſo atrocious in their nature, that the relation of them cannot be read without horror; and we are led to hope, that they are recited by the Jeſuit miſſionaries, to whom the bonzes have been great enemies, and againſt whom they have excited various perſecutions, with ſome exaggeration.

We read of their privately ſeizing men and women, and hurrying them away in a cloſe ſedan, where nothing is to be ſeen but the tops of their heads, and their eyes moving in a terrifying manner, to the next river or canal, and drowning them without mercy, before crowds of ſpectators, who are harangued by one of the fraternity into a firm belief that the perſons ſo treated had earneſtly requeſted to be thus diſpatched out of the world, in order to obtain immortality in a future ſtate. With all the external appearances of ſanctity and auſterity, theſe bonzes unite voluptuous manners and ſecret profligacy, of which various inſtances are recited. Notwiſtanding the infatuation which induces the vulgar to ſupport the popular ſuperſtition of the country, the condition and character of a bonze are generally deſpiſed in China. Moſt of theſe fanatical impoſtors are ſprung from the dregs of the people. Thoſe of Pegu, however, are ſaid to be generally gentlemen of the higheſt extraction. See PEGU. To recruit and perpetuate their ſect, they purchaſe young children, whom they betimes initiate in all their myſteries, and whom they inſtruct in every trick and deception which may render their profeſſion profitable; theſe afterwards ſucceed them, and tranſmit their arts to other young bonzes, who are educated in the ſame manner. They are, in general, very ignorant, and unable to give an exact account even of the true doctrine of their ſect. Although they have no regular hierarchy, they acknowledge ſuperiors, whom they call "ta-ho-ſhang," or grand bonzes. This rank ſecures to thoſe who have attained it particular diſtinction, and the firſt place in all religious aſſemblies at which they may be preſent. There are bonzes of all conditions; ſome deſtined only for collecting alms; others, better ſkilled in the art of ſpeaking, and who have acquired ſome knowledge of the Chineſe literature, are commiſſioned to viſit the literati, and to inſinuate themſelves into the houſes of the great; old men, rendered venerable by age, and by a grave deportment, are employed to exerciſe their talents among the female ſex; theſe preſide in all their aſſemblies, which, though not common, are held, however, in ſeveral provinces. Theſe religious clubs are very lucrative to the bonzes. One of theſe prieſts enters the chapel, where the female devotees are aſſembled, and ſings ſome anthems to the god Fo. At length, after having for ſome time repeated "Omito Fo," (Omito being the name of another deity more ancient than Fo, and worſhipped by the Japaneſe under the name of Amida, which ſee), and after being ſtunned with the tinkling noiſe of ſeveral ſmall kettles, upon which they beat, they place themſelves at table, and the noiſy devotion terminates with mirth and a good repaſt. On days of greater ſolemnity, the bonzes adorn their places of worſhip with ſeveral idols, and numerous paintings, exhibiting under various forms the different puniſhments inflicted on the wicked in hell. The prayers and feaſting continue ſeven days, during which their chief buſineſs is to prepare and conſecrate treaſures for the other world. In every province of China there are temples, to which numerous votaries repair; ſome of them making pilgrimages thither from very remote places. The pilgrims climb theſe ſacred mountains with great difficulty, and are ſometimes dragged up on their bended knees. Thoſe, whoſe age or infirmities, or urgent buſineſs, will not allow of their joining theſe devout caravans, commiſſion ſome of their friends to bring them a large leaf filled with characters, and ſtamped by the bonzes in a particular corner. The centre of this leaf is occupied by the image of the good Fo. On the veſtments of the god, and around his figure, are traced out a multitude of circles, intended for the following purpoſe.—The devotees of the god, whether male or female, wear hanging from their necks, or around their arms, a kind of chaplet, compoſed of 100 beads of moderate ſize, divided by three which are much larger; and a bead, ſtill bigger, in form of a ſmall gourd, ornaments the top of the chaplet. Theſe beads they roll between their fingers, pronouncing the myſterious words "O-mi-to, Fo!" and each of theſe invocations is accompanied hy a genu-flection. When they have completed the number of 100, equal to that of the beads, they mark with a red ſtroke one of the circles which ſurround the figure of the god Fo, on the leaf ſtamped by the bonzes. This leaf becomes the regiſter of all the prayers which they have repeated in the courſe of their lives. To verify its authenticity, the bonzes are, from time to time, invited to their houſes, where they muſt atteſt the number of circles marked with red ſtrokes, and imprint their ſeals on the leaf. When any of them dies, this valuable memorial is carried at the funeral with the greateſt ſolemnity, and depoſited in a ſmall box cloſely ſhut and ſealed: this they call "lou-in," or a paſſport for the other world; and it

coſts

costs a large sum of money to have all these formalities observed.

It has been already hinted, that the bonzes are peculiarly inimical to the progress of the Christian religion in China, Japan, &c.; and that they have excited a spirit of persecution against the European missionaries, who have hitherto been chiefly Jesuits of the church of Rome. These strangers, they say, have introduced themselves into China for the purpose of invading it; the new doctrine they preach is calculated, as they pretend, to procure followers, and a number of partisans, sufficient to second their efforts, when European troops and fleets shall be ready to attack them; and sometimes they allege, that the missionaries persuade people to embrace their doctrine merely by the aid of sorcery, and that they gain converts, and fix their attachment by lavishing gold and silver among them, of which they have great abundance, because they possess the secret of imitating and counterfeiting these precious metals. By such and similar representations, they have checked the zeal, and counteracted the efforts of Christian missionaries. Le Compte, State of China. Du Halde's China, vol. i. Grossiere's China, vol. ii.

It has been observed (see Embassy to China, vol. ii. p. 100.), that the likeness is so strong between the apparent worship of many of the priests of Fo, and that which is exhibited in churches of the Roman faith, that a Chinese, conveyed into one of the latter, might imagine the votaries he saw were then adoring the deities of his own country. On the altar of a Chinese temple, behind a screen, is frequently a representation which might serve for that of the Virgin Mary, in the person of "Shin-moo," or the sacred mother, sitting in an alcove with a child in her arms, and rays proceeding from a circle, which are called a glory, round her head, with tapers burning constantly before her. The long coarse gowns of the Ho-shangs, or priests of Fo, bound with cords round the waist, would almost equally suit the friars of the order of St. Francis. The former live, like the latter, in a state of celibacy, reside together in monasteries, and impose occasionally upon themselves voluntary penance and rigorous abstinence.

BOO-Hadjar, in *Geography*. See Agar.

Boo-*Jeemah*, a river of Africa, in the province of Constantina, which runs along the western side of the marsh which separates betwixt Bona and the ancient Hippo. Over this river is a bridge of Roman structure.

Boo-*Shatter*, a town of Africa, in the kingdom of Tunis, said by Shaw (Trav. p. 79.) to be built on the ruins of the ancient Utica, which see.

BOOBERAK, a river of Africa, in the kingdom of Algiers, formed by the junction of the Nissah and Bugdourah. Its mouth, which is made up of a number of branches, is the eastern boundary of the province of Titterie.

BOOBY, a word of uncertain etymology, derived by Skinner from the Spanish *bobo*, foolish; but deduced by Junius from *bowbard*, an old Scottish word for a coward or contemptible fellow; denotes a dull, heavy, stupid person.

Booby *island*, in *Geography*, a small island in the West Indies, lying directly opposite to Mosquito bay, at the S. E. extremity of the island of St. Christopher's, and more than half a league from it, off the north end of Nevis island.—Also, a small island, supposed to be one of the islands called Prince of Wales's islands, extending from thence and Wallis's island, as far as New Guinea.

Booby, in *Ornithology*, the name of *pelecanus sula* in Catesby's Natural History of Carolina. The *great booby* of Catesby is a variety of *pelecanus bassanus*. *Brown booby* of Latham, *pelecanus fiber*; *lesser booby*, *pelecanus parvus*; *spotted booby*, *pelecanus maculatus*.

BOODGE-BOODGE, or Booge-booge, in *Geography*, a town of Hindoostan, the present capital of the territory of Cutch, and residence of its rajah. It is also called Booz, and placed in a map, to which Mr. Rennell refers, about 34 geographical miles to the E. or E. S. E. of the eastern branch of the Indus: 120 miles S. E. of Tatta, and about 200 W. of Ahmedabad.

BOODH, *Bouddha*, *Budha*, or *Buddou*, in *Mythology*, a deity very anciently and very generally worshipped in India. The name of this deity is variously expressed by different writers. In the Pali language, and among the Cingalese, his common name is Bouddha. Mr. Chambers, in the Asiatic Researches, writes Buddou; and Paulinus (Mus. Borg.), Budha; and from these two appellations we may easily deduce the Budda or Butta of Beaufobre and Bochart, the Bod of the Arabians, Bodda of Edrisi, Βουττα of Clemens Alexandrinus, and Baouth of M. Gentil. The name is said to be an appellation, synonymous with sage or philosopher, and expressive of wisdom. By Budha, says the learned Bryant, (Anal. Anc. Mythol. vol. iii. p. 573.) we are certainly to understand the idolatrous symbol, called by some nations Buddo; the same as Argus and Theba. In the mythology transmitted concerning it we may see a reference both to the machine itself, and to the person preserved in it. In consequence of which we find this person also styled Bod, Budhu, and Buddo; and in the west Butus, Battus, and Bœotus. He was said by the Indians not to have been born in the ordinary way; but to have come to light indirectly through the side of his mother. By Clemens of Alexandria, he is called Bouta; and in the history of this person, however varied, we may perceive a relation to the Arkite deity of the sea, called Poseidon; also to Arcalus and Dionusus; styled Bœotus and Thebanus. Different learned men have supposed Boudha to have been the same with Noah, Moses, or Siphoas the 35th king of Egypt; and sir William Jones supposed Bouddha to have been the same with Sesac or Sesostris, king of Egypt, who by conquest spread a new system of religion and philosophy from the Nile to the Ganges, about 1000 years before Christ. In order to reconcile some differences of opinion among the Hindoos, with regard to the time of Bouddha's appearance, this learned writer agrees with Giorgi in supposing, that they have confounded two Bouddhas; the younger of whom established the new religion, which gave great offence to the bramins in India, and was introduced into China in the first century of our æra; whereas the more ancient Bouddha preceded him by many centuries, and is referred by sir W. Jones, after a variety of computations, to the year 1027 before Christ. For want of adverting to this circumstance, he confounded the latter Bouddha with the Woden of the Goths. Mr. Chambers also remarked, that Pood or Poaden, which is the Siamese mode of pronouncing the Boodh of the Indians and Birmans, bears a striking resemblance to the Gothic Woden; and it is further suggested, that Boodh is the Dies Mercurii, the Wednesday, or Woden's day, of all Hindoos. But etymological reasoning, more especially when it interferes with chronology, is not sufficient to establish the identity of Boodh and Woden. According to the chronology of the Hindoos, which sir W. Jones has minutely investigated and detailed, Boudha was the ninth "Avatar," or descent of the deity, in his capacity of preserver, or the ninth incarnation of Vishnou, which was long antecedent to the existence of the deified hero of Scandinavia, who, according to some writers, was a contemporary of Pompey and Julius Cæsar, and who is placed by the author of the Northern

Antiquities, 70 years after the Chriſtian æra. Beſides, the attributes of Boodh and Odin are very different. The deity, whoſe doctrines were introduced into Scandinavia, was a god of terror, and his votaries carried deſolation and the ſword throughout whole regions; whereas the ninth Avatar (ſee Maurice's Hiſt. of Hindooſtan, vol. ii. part 3.) introduced the peaceful olive, and appeared in the world for the purpoſe of preventing ſanguinary acts. He ſeverely cenſured the ſacrifice of cattle, or depriving any being of life, and is denominated the author of happineſs. His place of reſidence is ſaid to have been diſcovered at Boodha Gaya in Bengal, by the illuſtrious Amara, renowned amongſt men; and according to an inſcription in Sanſcrit, found on a ſtone in this place, and tranſlated by Mr. Wilkins, (Aſiatic Reſearches, vol. i. p. 284.) he caused an image of the ſupreme ſpirit Bood-dha to be made, and worſhipped it according to the law, with perfumes, incenſe, and the like; and he thus glorified the name of that ſupreme being, the incarnation of a portion of Veeſhnoo: "Reverence be unto thee in the form of Bood-dha! reverence be unto the lord of the earth! reverence be unto thee, an incarnation of the deity and the eternal one! reverence be unto thee, O God, in the form of the God of mercy, the diſpeller of pain and trouble, the lord of all things, the deity who overcometh the ſins of the Kalee Yoog, the guardian of the univerſe, the emblem of mercy toward thoſe who ſerve thee!" &c. As the doctrines of Boodh and Woden are different, and their æras are very remote, they muſt of courſe be different perſons. The Buddha of the Hindoos is unqueſtionably, ſays ſir W. Jones, the Foe or Fo of China; and M. de Guignes, on the authority of four Chineſe hiſtorians, aſſerts, that Fo was born about the year before Chriſt 1027, in the kingdom of Caſhmir. Mr. Chambers, following M. Gentil, and followed by Paulinus, conceives, by a very forced train of etymology, the Fo or Fohi of the Chineſe to be a corruption of Bouddha. Nor is the derivation of Taautos, Toth, or Touth, the Egyptian name for Hermes from Bouddha, leſs fanciful; and yet Fo-hi, the progenitor of the Chineſe, a military tribe, whom the Hindoos call the Chandravanſa, or children of the moon, was, according to their Puranas or legends, Buddha, or the genius of the planet Mercury.

Among the various appellations by which the deity Buddha is known in ſeveral parts of the Eaſt, that of Godama is very common. This Godama, Gaudma, or Gotma, &c. as his name is differently expreſſed, is ſaid to have been a philoſopher, and is believed by the Birmans to have flouriſhed above 2300 years ago; he is ſaid to have taught in the Indian ſchools the heterodox religion and philoſophy of Boodh. See GODAMA. The image that repreſents Boodh is called Gaudma or Goutum, which is now a commonly received appellation of Boodh himſelf: this image is the primary object of worſhip in all countries ſituated between Bengal and China. The ſectaries of Boodh contend with thoſe of Brahma for the honours of antiquity, and are certainly far more numerous. The Cingaleſe in Ceylon are Boodhiſts of the pureſt ſource, and the Birmans acknowledge to have received their religion from that iſland, which they call Zehoo. From thence it was brought, as the Rhahaans ſay, to Arracan, and it was then introduced into Ava, and probably into China; for the Birmans confidently aſſert, that the Chineſe are Boodhiſts. Kæmpfer, ſpeaking of the Budz, or Seaka, (Shaka, Shakya, Sjaka, or Sakya, denoting, according to Paulinus, the cunning, or the god of good and bad fortune,) ſays, (Hiſt Japan. b. iv. c. 6.) "I have ſtrong reaſons to believe, both from the affinity of the name, and the very nature of this religion, that its author and founder is the very ſame perſon whom the Bramins call Buddha, and believe to be the eſſential ſpirit of their Wiſhna (Viſhnou) or their deity, who made his ninth appearance in the world under this name; the Peguers call him Samana Khutama." Where he treats concerning the introduction of Boodh into China, he ſays, (id. ibid.) "about the year of Chriſt 518, one Darma, a great ſaint, and twenty-third ſucceſſor in the holy ſee of Seaka (Buddha), came over into China from Seitenſeku, as the Japaneſe writers explain it, that is, from that part of the world, which lies weſtward with regard to Japan, and laid, properly ſpeaking, the firſt firm foundation of the Budſdoiſm in that mighty empire." Others ſay, that the ſect of Boudha was introduced into China in the year of our æra 630, and that from China it extended itſelf to Japan, Tonquin, Cochinchina, and the moſt remote parts of Tartary.

Whatever may be the antiquity of the worſhip of Boodh, or Buddha, we can entertain no doubt of the wide extent of its reception and prevalence. In the iſland of Ceylon, in the extenſive Birman empire, in the kingdoms of Siam and Cambodia, the prevailing religion is that of Bouddha or Godama, and Mr. Chambers (Aſiatic Reſearches, vol. i. p. 162, &c.) has given very good reaſons for believing that the worſhip of Bouddha extended all over India, and was not rooted out by the Bramins in the Deccan, ſo lately as the 9th, or even the 12th century of the Chriſtian æra. From the hiſtory of Caſhmire, preſented to the ſultan Acbar, on his firſt entrance into that kingdom, we learn, that Jelowk, one of its moſt powerful princes, tolerated the doctrine of Bouddh; and that it was not till the reign of Nerkh the 59th prince, A. D. 342, that the Brahmins acquired the aſcendency over the followers of Boodh, and burned down their temples. In Nepal the moſt ancient religion is that profeſſed by a ſect who call themſelves "Baryefu," and who ſeem to be worſhippers of Bouddha. In Narhoara or Nehrwaleh, the capital of the kingdom of Guzerat, we find that even after the Mahometan invaſion, in the 11th century of our æra, Edriſi, who wrote in the 12th century, informs us, that the people continued in the worſhip of the idol Bodda or Bud. This Arabian geographer adds, that the worſhip of the prince of this country, who reigned on the Malabar coaſt, with the title of Balhara, and whoſe dominions extended over Guzerat, and the greateſt part, if not the whole of Viſiapour, was addreſſed to Bodda, who, according to St. Jerome and Clemens Alexandrinus, was the founder of the ſect of the Gymnoſophiſts, in like manner, ſays M. d'Anville, as the Brahmins were uſed to attribute their inſtitution to Brahma. If the conjectures of ſir William Jones, relating to the inſcriptions found at Mongheer, and on the pillar of Buddal, be well founded, the governing powers on the banks of the Ganges, as late as about the time of the birth of Chriſt, were of the ſect of Bouddha; and however idle and ridiculous the legends and notions of the worſhippers of Bouddha may be, they have been in a great meaſure adopted by the Brahmins; but with all their defects and extravagances much aggravated, rajahs and heroes being converted into gods, and impoſſibilities accumulated on improbabilities. From various authorities, to which we might refer, it ſufficiently appears, that the worſhip of Bouddha, or Buddou, has prevailed in ſeveral parts of India at a period prior to that of the Brahmins; and that this has been the caſe even ſo late as the 9th and the 12th centuries of the Chriſtian æra; and that this ſyſtem forms the baſis of that religion which the Brahmins have brought with them into the ſouthern parts of the peninſula of Hindooſtan, into Madura, Tanjore, and Myſore. In thoſe parts of India, and chiefly on the coaſt of Coromandel, and in Ceylon, the god Baouth, ſays M. Gentil, of whom, at preſent, they know no more in India than the name, was the object of worſhip;

but it is now totally abolished; except that there may be found some families of Indians, who have remained faithful to Baouth, and do not acknowledge the religion of the Brahmins; and on that account separated from and despised by the other castes. It is generally allowed, that about the time of Christ the Brahmins gained a superiority over the worshippers of Bouddha; and about 900 years afterwards, we find them totally overthrowing his doctrine in its native country, and persecuting his followers. The Vedas, which are commonly supposed to be the oldest books of the Brahmins, are of later date than the time of Bouddha, as is evident from the mention which they make of that personage. Asiatic Researches, vols. i. ii. and iv. Symes's Embassy to Ava, vol. ii. ch. 13. For a further account of the votaries of Bouddha, as well as the principles and rites of his worship; see BRACHMANS, GODOMA, RAHANS, SAMANEANS, and TIRINANXES. See also BIRMAN *empire*, CEYLON, CHINA, COCHINCHINA, SIAM, &c.

BOODICOTTA, in *Geography*, a town of the peninsula of India, in the Mysore country; 87 miles E. N. E. of Seringapatam, and 33 E. S. E. of Bangalore. N. lat. 12° 50′. E. long. 78° 20′.

BOOG, or BOGOE, a small island of Denmark, between the island of Moen and Falster.

BOOGOO, in *Zoology*, the species of BABOON called *Simia maimon*, by Linnæus. See MAIMON.

BOOK, a writing composed on some point of knowledge by a person intelligent therein, for the instruction or amusement of the reader.

The word is formed from the Saxon *boc*, which comes from the Northern *buech*, of *buechaus*, a *beech* or *service-tree*, on the bark of which our ancestors used to write.

Book may be defined more precisely, a composition of some man of wit or learning, designed to communicate, to prove, or illustrate some science, art, truth, or invention.

Book is distinguished from pamphlet, or single paper, by its great length; and from tome or volume, by its containing the whole writing on the subject. Isidore makes this distinction between *liber* and *codex*; that the former denotes a single book, the latter a collection of several; though, acording to Scipio Maffei, *codex* signifies a book in the square form; *liber*, a book in the roll form. The primary distinction between *liber* and *codex* seems to have been derived, as Dr. Heylin has observed, from the different materials used for writing, among the ancients. From the innerside of the bark of a tree, used for this purpose, and called in Latin *liber*, the name of liber applied to a book was deduced; and from tablet, formed from the main body of a tree, called *caudex*, was derived the appellation of *codex*.

We say an old book, a new book; a Latin, a Greek book; to read, to write, to publish a book; the preface, the title, the dedication, the index of a book. To collate a book, is to see that it be perfect, and that none of the sheets be either wanting or transposed. Book-binders speak of folding, sewing, beating, pressing, covering, gilding, and lettering of books. See BOOKBINDING.

A large collection of books is called a library. An inventory of a library, in order to the reader's finding any book, is called a catalogue

The history or *notitia* of books makes the first part, according to some the whole, of the literary science.—The principal points of the notitia of a book are, its author, date, printer, edition, versions, comments, epitomes, success, eulogies, censures, condemnation, suppression, adversaries, vindicators, continuators, and the like.

The history of a book is either of its contents, which is given by analysing it, as is done by journalists and reviewers; or of its appendages, and accidents, which is the more immediate province of those called literators, and bibliothecarians.

The contents of a book are the matters delivered in it; which make the province of the author. Of these there is one principal matter, called the subject; in respect of which the rest are only incidents.

The appendages of a book are, the title, preface, epistle dedicatory, summaries, table of contents, index, and the like, which are the proper province of the editor, unless perhaps the title page, which is frequently usurped by the bookseller.

In the composition of a book, there occur sentiments, which are also the materials of it; method, the order wherein these are disposed; and style, or expression, which is the language in which they are clothed.

The giving of histories, catalogues, and bibliothecas of books, is said to have been first introduced by the Germans; we may add, that they have best succeeded in them; and to them the chief works of this kind are owing. I. Alb. Fabricius has given us the history of the Greek and Latin books: Wolfius, that of the Hebrew books; Boecler, of the principal books in each science and faculty; Struvius, of the books of history, law, and philosophy; the abbot Fabricius, of the books of his own library; Lambecius, of those in the Vienna library; Le Long, of the books of Scripture; Mattaire, of the books printed before the year 1550; and Morhoff, a general literary history of this kind, under the title of Polyhistor. The various catalogues of choice libraries are useful and necessary for the same purposes: so are likewise the relationes, &c. and the reviews which have been periodically published. See BIBLIOTHECA.

BOOKS, as *to the materials of*, they were first written on stones, witness the Decalogue given to Moses (which is the oldest book we have any warranted account of); then, on the parts of plants, e. gr. the leaves, chiefly of the palm-tree; the rinds and barks especially of the tilla or philyra, and the Egyptian papyrus. By degrees, wax, then leather, were introduced, especially the skins of goats and sheep, of which, at length, parchment was prepared: then lead came in use; also linen, silk, horn, and lastly, paper itself. See PAPER.

The parts of vegetables continued long the common matter of books; insomuch that most of the names and terms belonging to books, in most languages, are taken thence: as the Greek *biblos*, the Latin *liber*, *codex*, *folium*, *tabula*, and the English *book* itself. We may add, that vegetable barks appear still in some measure retained for books in certain of the northern countries, as among the Calmuc Tartars, where a library was discovered by the Russians, of an unusual form as well as matter: the books were exceedingly long, but of no breadth; the leaves very thick, and made of barks of trees, smeared over with a double varnish; the ink, or writing, being white on a black ground. Hist. Acad. R. Inscr. t. iii. p. 6.

Whatever were the materials used by the ancients for their books, they were liable to be easily destroyed by the damp, when hidden in the earth; and in times of war, devastation, and rapacity, it was necessary to bury in the earth whatever they wished to preserve from the attacks of fraud and violence. Accordingly, it is well known that persons, whose property was thus exposed, concealed in this manner, not only silver and gold, but wheat, barley, oil, and honey; and also their garments, and their writings. With this view, Jeremiah ordered the writings, which he delivered to Baruch, to be put in an earthen vessel. See chap. xxxii. In the same manner the ancient Egyptians made use of earthen urns, or pots of a proper shape, for containing what-

whatever they wanted to inter in the earth, and which, without ſuch care, would have been ſoon deſtroyed. We need not wonder then, that the prophet Jeremiah ſhould think it neceſſary to encloſe thoſe writings in an earthen pot, which were to be buried in Judæa, in ſome place where they might be found without much difficulty on the return of the Jews from captivity. Accordingly two different writings, or ſmall rolls of writing, called books in the original Hebrew, were deſigned to be encloſed in ſuch an earthen veſſel; but commentators have been much embarraſſed in giving any probable account of the neceſſity of two writings, one ſealed, the other open; or, as the paſſage has been commonly underſtood, the one *ſealed up*, the other left *open* for any one to read; more eſpecially, as both were to be alike buried in the earth and concealed from every eye, and both were to be examined at the return from the captivity. In order to ſolve this difficulty, the ingenious Mr. Harmer (Obſ. on Script. vol. iv. p. 4.) remarks, that though one of them is ſaid to be *ſealed*, it doth not follow that it was ſealed in ſuch a manner as not to be opened. Like modern deeds for the conveyance of land, it might have been ſealed, though not with wax, yet, according to the preſent eaſtern manner, with ink, ſo as to be valid. Moreover, the word tranſlated *open*, in reference to the evidence, or book which was open, is not the ſame that is twice uſed by Nehemiah, ch. viii. 5.; but it is a word, which ſignifies (1 Sam. iii. 7. 21. Dan. ii. 19, 30. x. 1.) the revealing of future events to the minds of men by a divine agency; and it is particularly uſed in the book of Eſther, (ch. viii. 13.) to expreſs a book's making known the decree of an earthly king. Conſequently the *open book* of Jeremiah ſeems to ſignify, not its being then lying open or unrolled before them, while the other was ſealed up; but the book that had revealed the will of God, to bring back Iſrael into their own country, and to cauſe buying and ſelling of houſes and lands again to take place among them. This was a *book of prophecy*, opening and revealing the future return of Iſrael, and the other little book, which was ordered to be buried along with it, was the purchaſe deed. By adverting to the different modes of writing in the Eaſt, we obtain a ſatisfactory interpretation of a paſſage in the book of Job, (ch. xix. 23, 24.) and a diſtinct view of the beautiful gradation which is loſt in our tranſlation: "O that my words were now written! O that they were printed (written) in a book! that they were graven—in the rock for ever!" In the Eaſt there is a mode of writing, which is deſigned to fix words in the memory, but the writing is not intended for duration. Accordingly, we are informed by Dr. Shaw, (Trav. p. 194.) that children learn to write in Barbary by means of a ſmooth thin board, ſlightly covered with whiting, which may be wiped off, or renewed at pleaſure. As many occurrences were effaced from the memory of the Arabs in the time of Job, as well as from their writing tables, as it now often happens in Barbary; Job expreſſes his wiſh not only that his words were written, and written in a book, from which they ſhould not be blotted out, and graven in a rock, the moſt permanent mode of recording them, and much more effectual for perpetuating them than a book.

We find in Signior Caſtagnatta's account of the aſbeſtos, a ſcheme for the making of a book, which from its imperiſhable nature, he is for calling the *book of eternity*. The leaves of this book were to be of the aſbeſtos paper, the covers of a thicker ſort of work of the ſame matter, and the whole ſewed together with thread ſpun from the ſame ſubſtance. The things to be commemorated in this book were to be written in letters of gold, ſo that the whole matter of the book being incombuſtible and everlaſtingly permanent againſt the force of all the elements, and ſubject to no changes from fire, water, or air, muſt remain for ever, and always preſerve the writing committed to it. See PAPER.

Books, *form of*. The firſt books were in the form of blocks and tables, of which we find frequent mention in Scripture, under the appellation *ſepher*, which the Septuagint render αξονες, q. d. *ſquare tables:* of which form the book of the covenant, book of the law, book, or bill of divorce, book of curſes, &c. appear to have been. As flexible matters came to be wrote on, they found it more convenient to make their books in form of rolls, called by the Greeks κοντακια, by the Latins *volumina*, which appear to have been in uſe among the ancient Jews as well as Grecians, Romans, Perſians, and even Indians. And of ſuch did the libraries chiefly conſiſt, till ſome centuries after Chriſt. The form which obtains among us is the ſquare, compoſed of ſeparate leaves; which was alſo known, though little uſed, among the ancients; having been invented by Attalus, king of Pergamus, the ſame alſo who invented parchment: but it has now been ſo long in poſſeſſion, that the oldeſt manuſcripts are found in it. Montfaucon aſſures us, that of all the ancient Greek manuſcripts he has ſeen, there are but two in the roll form; the reſt being made up much after the manner of the modern books. See BOOK-BINDING.

The rolls, or volumes, were compoſed of ſeveral ſheets, faſtened to each other, and rolled upon a ſtick, or *umbilicus*; the whole making a kind of column, or cylinder, which was to be managed by the *umbilicus*, as a handle; it being reputed a kind of crime to take hold of the roll itſelf. The outſide of the volume was called *front*; the ends of the *umbilicus*, were called *cornua*, *horns;* which were uſually carved and adorned likewiſe with bits of ſilver, ivory, or even gold and precious ſtones. The title Συλλαβος was ſtuck on the outſide. The whole volume, when extended, might make a yard and a half wide, and fifty long. Fabric. Bibl. Antiq. c. 19. § 7. p. 607.

Sir John Chardin informs us, in a note on Iſ. viii. 1. that the eaſtern people roll their papers, and do not fold them, becauſe their paper is apt to fret. Whilſt the Ægyptian papyrus was in common uſe, its brittle nature made it proper to roll up what they wrote: and as this had been a cuſtomary practice, many continued it when they uſed other materials, which might very ſafely have been treated in a different manner. This method of rolling up their books is referred to in the New Teſtament; and that they were of the ſame form much more anciently, we learn from Jer. xxxvi. 2. Pſ. xl. 7, &c. &c.

It is cuſtomary not only to wrap up Oriental books and letters which are rolled up, in an elegant and coſtly covering; but to inſcribe words on theſe coverings, which give a general notion of their contents. This practice of writing on the outſide of the caſe of a letter, or book rolled up, ſeems to be at leaſt as ancient as the time of Chryſoſtom, as we learn from a note of Lambert Bos on Pſ. xxxix. 7. as it occurs in the LXX. v. 40, in our verſion. Chryſoſtom remarks, that they call a wrapper (ειλημα) the Κεφαλις, which is the word the Septuagint tranſlators make uſe of to expreſs the Hebrew word we tranſlate volume: "In the volume of the book it is written of me." The learned father ſeems to ſuppoſe, that there was written *in* or *on* the covering of the ſacred volume, a word or words which ſignified the "coming of the Meſſiah." But Chryſoſtom would hardly have thought of ſuch an interpretation, if it had not been frequently done at Conſtantinople in his time, or by the more eaſtern princes that had buſineſs to tranſact with the Greek emperors, or been known to have been

practised before those times among the Jews. Chrysostom lived in the 4th century. Aquila, who is thought to have lived above 100 years sooner, and is allowed to be a most close translator of the Hebrew, uses, according to Bos, the same word πλαμα, or wrapper, to express the Hebrew word we translate volume. He therefore supposed that what was written, to which this passage refers, was written on the covering or wrapper of the sacred books. This explanation suggests a much more agreeable mode of rendering the word than our English term *volume;* since every ancient Hebrew book was a volume, or roll, and consequently the passage merely expresses; "In the book it is written of me." But if we understand it of the *case* in which their books were wrapped up, the thought is not only clear and distinct, but very energetic, and amounts to this, that the sum and substance of the sacred books is, that "the Messiah cometh;" and that those words accordingly might be wrote or embroidered, with great propriety, on the wrapper, or case in which they were kept.

Another translation renders the word εν τομῳ, which intimates that the motto was inscribed on the cylinder, round which books of this form were wont to be rolled. In this case, it was probably written on that part of the cylinder which reached beyond the parchment, linen, or whatever material was used, and which was convenient enough for exhibiting, in brief, what the purport of the volume was. Mr. Harmer (Obs. on Script. vol. iv. p. 11.) suggests, that the circle of gold, with the name of one of our Saxon princes upon it, and ornamented after the manner of those times, might be designed to case the end of the cylinder, or one of the cylinders, on which some book belonging to that monarch, or relating to him, was rolled; of which ancient piece of gold an engraving is given in the seventh volume of the Archæologia, or Transactions of the Antiquarian Society. This sort of caping to those cylinders used to be called the "Aestel."

To the form of books belongs also the *economy of the inside*, or the order and arrangement of points and letters into lines and pages, with margins, and other appurtenances. This has undergone many varieties: at first, the letters were only divided into lines, then into separate words; which, by degrees, were noted with accents, and distributed by points and stops into periods, paragraphs, chapters, and other divisions. In some countries, as among the Orientals, the lines began from the right, and ran to the left; in others, as in Northern and Western nations, from the left to right; others, as the Grecians, followed both directions alternately, going in the one, and returning in the other, called *boustrophedon*. In the Chinese books, the lines ran from top to bottom. Again, the page in some is entire, and uniform; in others, divided into columns; in others, distinguished into texts and notes, either marginal, or at the bottom: usually it is furnished with signatures and catchwords; also with a register to discover whether the book be complete. To these are occasionally added the apparatus of summaries, or side notes; the embellishments of red, gold, or figured initial letters, head-pieces, tail-pieces, effigies, schemes, maps, and the like. The end of the book now denoted by *finis*, was anciently marked with a ⊂, called *coronis*, and the whole frequently washed with an oil drawn from cedar, or citron chips, strewed between the leaves to preserve it from rotting. There also occur certain *formulæ* at the beginning and end of books; as among the Jews, the word חזק, *esto fortis*, which we find at the end of the books of Exodus, Leviticus, Numbers, Ezekiel, &c. to exhort the reader to be courageous, and proceed on to the following book. The conclusions were also often guarded with imprecations against such as should falsify them; of which we have an instance in the Apocalypse. The Mahometans, for the like reason, place the name of God at the beginning of all their books, which cannot fail to procure them protection, on account of the infinite regard had among them to that name, wherever found. For the like reason it is, that divers of the laws of the ancient emperors begin with the *formula, In nomine Dei.* At the end of each book the Jews also added the number of verses contained in it, and at the end of the Pentateuch the number of sections; that it might be transmitted to posterity entire. The Masoretes and Mahometan doctors have gone farther; so as to number the several words and letters in each book, chapter, verse, &c. of the Old Testament, and the Alcoran. See ALCORAN, BIBLE, MASSORA, &c.

The kinds and denominations of books are various.

BOOKS, with regard to their *use and authority*, may be divided into *human* and *divine*, also called *sacred* and *inspired* books.

BOOKS, *Sibylline*, those composed by certain pretended prophetesses, deposited in the Capitol, under the care of *Duumviri*. See SIBYLS.

BOOKS, *Canonical*, those received and allowed by the church as parts of holy scripture. Such are the books of the Old and New Testament, as commonly bound up together. See CANON and BIBLE.

BOOKS, *Apocryphal*, those excluded out of the canon, yet received and read in some churches. See APOCRYPHAL.

BOOKS, *Authentic*, those which are decisive, and of authority: such, in the civil law, are the Code, Digest, &c. in our law, the Statutes, &c. Bacon de Augm. Sc. l. 8. c. 3.

BOOKS, *Auxiliary*, those less essential, yet of use, as subservient to the others: as in the study of the law, books of Institutes, Formulæ, Maxims, Reports, &c.

BOOKS, *Elementary*, those which deliver the first principles of sciences: such are those under the titles of Rudiments, Methods, Grammars, &c. by which they stand contradistinguished from books of a superior order, which aim at making farther advances in the sciences.

BOOKS, *Library*, such as are not ordinarily read over, but turned to, and consulted occasionally; such are dictionaries, &c.

BOOKS, *Exoteric*, those intended for the use of popular and ordinary readers.

BOOKS, *Acroamatic*, those containing more secret and sublime matters, calculated for adepts and proficients in the subject.

BOOKS, *Public*, the records of past times and transactions kept by public authority.

BOOKS, *Church*, or *Ecclesiastical*, those used in the public offices of religion.

BOOKS, again, with regard to their *scope and subject*, may be divided into *historical*, those which relate facts, either by nature or mankind; *dogmatical*, those which lay down doctrines, or general truths; *miscellaneous*, those of a neutral kind, containing both facts and doctrines; *historico-dogmatical*, those which only rehearse doctrines, or, at most, indicate the arguments by which they are proved, as Mallet's Geometry; *scientifico-dogmatical*, those which not only recite the doctrines, but demonstrate them, as Euclid's Elements. Wolf. Phil. Rat. § 3. c. 1. § 744. 750, 751, &c.

BOOKS, *Pontifical*, among the Romans, were those appointed by Numa to be kept by the *pontifex maximus;* describing

cribing all the ceremonies, sacrifices, feasts, prayers, and other religious matters, with the manner, and circumstances, wherewith each was to be celebrated; these were also called *indigitamenta*, as containing the names of all the gods and the occasions, and *formulæ* of invoking each. Liv. i. p. 23.

Books, *Ritual*, those which directed the order and manner of founding, building, and consecrating cities, temples, and altars; the ceremonies belonging to walls, gates, tribes, curiæ, camps, and the like.

Books, *Augural*, called by Cicero *reconditi*, were those wherein the science of foretelling futurity, from the flight and chattering of birds, was contained. Cicer. Orat. pro domo sua ad pontiff. Serv. ad Æn. l. 5. v. 738. Lomei, de Bibl. c. 6.

Books, *Aruspicine*, those wherein the mysteries of divining from the entrails of victims are prescribed.

Books, *Acherontic*, those wherein the ceremonies and discipline of Acheron were contained; sometimes also called *libri Etrusci*, as being supposed to have been composed by Tages the Hetrurian; though others pretend, that he had received them from Jupiter himself: some suppose these to have been the same with the *libri fatales*; others with the *libri aruspicini*. Serv. ad Æn. l. 8. v. 398. Lomei, ubi supra.

Books, *Fulgural*, those written touching thunder and lightning, and their interpretation. As that composed by the Tuscan nymph Bigois, preserved in the temple of Apollo. Serv. ad Æn. l. 6. v. 72.

Books, *Fatal*, those wherein the ages, or terms of the life of men were written, according to the Hetrurian discipline. These were consulted by the Romans in all public calamities; and instructions taken from them, how to expiate the offended deities. Censor. de Die Natal. c. 14.

Books, *Black*, those which treat of necromancy, and witchcraft; or those which are printed in the old black letter, the Celtic character, now only retained by the Germans. The same denomination is also given to some other books. on account of the colour of their backs, or the dismalness of their contents; whence also *Red-book* and *Domesday-book*.

Books, *Good*, in the common usage, are those of devotion and piety, as soliloquies, meditations, prayers, &c. Vide Shaftesb. Charact. tom. i. p. 155. idem. tom. iii. p. 327. A *good book* in the bookseller's language, is a saleable one; in the language of the curious, a scarce one; in that of men of sense, an useful and instructive one.

Among five principal things which Rabbi Akiba recommended to his son, one was, that if he studied the law, he should take care to do it in a *good book*, lest he should be obliged to unlearn all again. Vide Cren. de Furib. Librar. See also farther, on the head of judging and chusing of Books.

Books, *Spiritual*, those which treat more expressly on the spiritual or Christian life, and their exercises, as to contemplation, &c.

Books, *Prophane*, such as do not treat of matters of religion.

Books, with regard to their *authors*, may be divided into *anonymous*, those without any author's name; *cryptonymous*, those whose authors' names are concealed in some anagram, or the like; *pseudonymous*, those which bear false names of authors; *posthumous*, those published after the author's death; *genuine*, those really written by the persons whom they pretend for their authors, and still remaining in the state wherein they were left by them; *spurious*, or *suppositious*, those pretended to be written by others than their real authors; *interpolated*, those which since their composition have been corrupted by spurious additions or insertions.

Books, with regard to their *qualities*, may be divided into *clear* or *perspicuous*, which, in the dogmatical kind, are those where the authors define all their terms accurately, and keep strictly to those definitions in the course of their works: *obscure*, those where words are used vaguely, and without defining: *prolix*, those which contain more things than were necessary to the author's design; as if in a book of surveying, a man should give all Euclid; *useful*, those which deliver things necessary to be known, either in other sciences, or in the business of life; *complete*, those which contain all that is known concerning the subject: *relatively complete*, those which contain all that was known concerning the subject, at a certain time; or, if a book were written with any particular design, or view, it may be said to be *complete*, if it contain neither more nor less than is necessary for the accomplishing of that end: in contrary cases, books are said to be *incomplete*.

Books, with regard to the *matter* of which they consist, may be divided into *paper-books*, those written either on linen and cotton paper, or on the papyrus, of which last kind few are now remaining. Montfaucon Pal. Græc. l. i. c. 2. p. 13. *Parchment-books*, *libri in membrana*, those written on skins, or pelts, chiefly of sheep. *Linen-books*, *libri lintei*, among the Romans, were those written on blocks, or tables, covered with a linen cloth. Such were the Sibylline books, and divers ancient laws, epistles of princes, leagues, annals, &c. Plin. Hist. Nat. l. xiii. c. 2. *Leathern books*, *libri in corio*, mentioned by Ulpian, are by Guilandinus taken for such as were written on barks, different from that usually written on; which was the *tilia*: by Scaliger, with more probability, for such as were written on certain skins, or certain parts of skins, different from those commonly used, which were the pelts, or back parts of sheep. Ulp. l. 52. Guiland. Papyr. Membr. 3. n. 50. Scaliger, and Guiland. *Block books*, *libri in schedis*, those written on wooden planks, or tablets, smoothed for that purpose with an *ascia*, and a plane. Such were the ordinary books among the Romans. *Waxen-books*, *libri in ceris*, mentioned by Pliny, have occasioned some dispute. Herm. Barbarus suspects the term to be a corruption, and inclines to read *in schedis*, instead of *in ceris*, on the authority of some ancient MSS. Others see no need of the emendation, since it is known the Romans sometimes covered their planks or *schedæ*, with a thin skin of wax, to make them susceptible of erasements and amendments, which the *libri in schedis* were not, and consequently were less fit for works that required elegance and accuracy than the waxen ones, which are also called *ceræ* or *libri cerei*. *Elephantine books*, according to Turnebus, were those written on thin slices, or leaves of ivory; according to Scaliger, those made of the guts of elephants; according to others, those wherein the acts of the senate, relating to the emperors, were written; according to others, certain huge or bulky books, consisting of 35 volumes, containing all the names of the 35 tribes. Salmuth. ad Pancirol. p. ii. p. 255. Guiland. Pap. Mem. 2. n. 48. Scal. ad Guil. p. 16. Calv. Lex. Jur. p. 534. Fabr. Descript. Urb. c. 6.

Books, with regard to their *manufacture* and *commerce*, may be divided into *manuscript*, those written with the hand, whether originally by the authors, called *autographi*, or at second hand by *librarii*, or *copyists*; *printed*, those wrought off from the press; *books in quires* or *sheets*, those not bound or stitched; *books in folio*, those wherein a sheet is folded but once, or makes two leaves, or four pages; *books in 4°*, where

where it makes four leaves; in 8°, where eight; *in duodecimo*, where twelve; in 16°, where sixteen; in 24°, where twenty-four.

Books, with regard to *circumstances* and *accidents*, may be divided into *lost*, those which have perished by the injuries of time, or the malice or zeal of enemies. Such are divers even of the ancient books of Scripture, written by Solomon, and others of the prophets. Fabr. Cod. Pseud. Vet. Test. tom. ii. p. 171. p. 247. Books *promised*, those which authors have given expectations of, which they have never accomplished. Jans. ab Almeloveen has given a Bibliotheca of books promised, but still latent, or not published. Books *fictitious*, those which never existed: to which may be added divers feigned titles of books. Loescher has published a great number of plans, or projects of books, many of them good and useful enough, if there were but books written corresponding to them. M. Dugono has a whole volume of *schemes* or *projects of books*, containing no less than 3000.

Books *in Ana*, *Anti*, &c. See Ana, Anti, &c.

Books, the *scope* or *design of*, is various; that of some is to trace the origin of things discovered; of others, to fix and establish some truth, or raise some doctrine to a higher pitch or subtilty; of others, to remove some scruple, or prejudice, which had before obtained, or fix more accurate and precise ideas of things: of others, to explain the names and words used in different nations, ages, and sects; of others, to improve our knowledge of facts, and events, and shew the order and ways of Providence; lastly, others aim at divers, or all of these ends.

Books, the *uses of*, are numerous; they make one of the chief instruments, or means of acquiring knowledge: they are the repositories of laws, and the vehicles of learning of every kind: our religion itself is founded on books: "Without them," says Bartholin," "God is silent, justice dormant, physic at a stand, philosophy lame, letters dumb, and all things involved in Cimmerian darkness." De Libr. Legend. Diss. i. p. 5.

The eulogiums which have been bestowed on books are infinite: they are represented "as the refuge of truth, which is banished out of conversation; as standing counsellors, and preachers, always at hand, and always disinterested; having this advantage over oral instructors, that they are ready to repeat their lesson, as oft as we please." Books supply the want of masters, and even, in some measure, the want of genius and invention: and can raise the dullest persons, who have memory, above the level of the brightest without them. An author who wrote not inelegantly, though in a barbarous age, sums up all their praises. Vide Lucas de Penna ap. Morhoff. Polyhist. lib. i. cap. 3. p. 27. "Liber est lumen cordis, speculum corporis, virtutum magister, vitiorum depulsor, corona prudentum, comes itineris, domesticus amicus, congerro talentis, collega & consiliarius præsidentis, myrothecium eloquentiæ, hortus plenus fructibus, pratum floribus distinctum, memoriæ penus, vita recordationis; vocatus properat, justus festinat, semper præsto est, nunquam non morigerus, rogatus confestim respondet; arcana revelat, obscura illustrat, ambigua certiorat, perplexa resolvit, contra adversam fortunam defensor, secundæ moderator, opes adauget, jacturam propulsat," &c.

Perhaps their greatest glory is, the affection borne them by many of the greatest men in all ages: M. Cato, the elder Pliny, the emperor Julian, and others, are on record for a very extraordinary devotion to books. This last has perpetuated his passion by some Greek epigrams in their praise. Richard Bury, bishop of Durham, and lord chancellor of England, has a treatise express on the love of books. Philobiblion, sive de Amore Librorum. Vide Plin. Epist. vii. lib. iii. Cato's attachment to books may be observed in the following paragraph.

"M. Catonem vidi in bibliotheca sedentem multis circumfusum Stoicorum libris. Erat enim, ut scis, in eo inexhausta aviditas legendi, nec satiari poterat: quippe qui, ne reprehensionem vulgi inanem reformidans, in ipsa curia soleret legere, sæpe dum senatus cogeretur, nihil operæ reipublicæ detrahens." Vide Cic. de Divin. lib. iii. n. 11. See also Cic. Orat. pro Arch. tom. iv. p. 2182.

Books, the *ill effects* objected to, are, that they employ too much of our time and attention; engage us in pursuits of no use to the commonwealth, and indispose us for the functions of civil life; that they render men lazy, and prevent their exerting their own talents, by furnishing them, on every occasion, with things that are the productions of others; and that our natural lights become weakened and extinguished, by inuring ourselves to see only with foreign lights: besides, that ill men are hereby furnished with means of poisoning the people, and propagating superstition, immorality, enthusiasm, or irreligion, which will always spread faster, and be received more greedily, than lessons of truth and virtue. Many other things are added concerning the emptiness of books, and the errors, fables, and follies they are fraught with: which, together with the multitude and perplexity of them, are such, that it may seem easier to discover truth in the nature and reason of things, than in the uncertainty and confusion of books. Add, that books have turned the other instruments of knowledge out of doors, as experiments, observations, furnaces, and the like, without which the natural sciences can never be cultivated to purpose; and that, in mathematics, books have so far superseded the exercise of invention, that the generality of mathematicians are now contented to learn the solution of problems from others; which is to relinquish the chief end of their science; since what is contained in mathematical books is properly the history only of mathematics, not the science, art, or talent of solving questions; which is hardly to be had from books, but only from nature and meditation.

Books, for the art of *writing*, or *composing*, we have much fewer helps and instructions than for the art of speaking; though the former be the more difficult of the two; as a reader is not so easy to be imposed upon, but has better opportunities of detecting faults than a hearer. A great cardinal, indeed, reduces an author's business to a few heads; were they but as easily practised as prescribed; "Let him consider who it is writes, what, how, why, and to whom." August. Valer. di Caut. in edend. lib. *The conditions required in a book* are, according to Selden, "solidity, perspicuity, and brevity:" the first will be best attained, by keeping the piece long by us, often reviewing and correcting it by the advice of friends: the *second*, by disposing the sentiments in a due order, and delivering them under proper and usual expressions: the *third*, by throwing every thing aside that does not immediately concern the subject. Were these rules observed, it would scarcely be possible for any, except an angel from heaven, to write many books. "Vix totidem quot Thebarum portæ vel divitiis ostia Nili." The custom is much altered since the times of the ancients, who carried their scrupulousness into what relates to the composition of books beyond all that has been above expressed; so august was the idea they formed of a book, that nothing would suffice less than its being a treasure: "thesauros oportet esse, non libros:" no labour, no assiduity and exactness, were thought enough to fit a work for the public view: every sentiment and expression were to be maturely weighed, and turned on all sides; and not suffered to pass, unless every word were a pearl, and every page beset with gems.

gems. So that they put the reader in poſſeſſion in a ſingle hour, of what had coſt them perhaps ten years' intenſe thought and application. Such were thoſe books, which were reputed "cedro digni," fit to be anointed with cedar-juice, and thus rendered incorruptible, for the inſtruction of all future ages.

Books, *for the origin of*, we have nothing that is clear: the books of Moſes are doubtleſs the oldeſt of all that are extant; but there were books before them, for Moſes cites ſeveral. A book of Enoch is cited in the epiſtle of Jude, v. 14. and 15. from which ſome endeavour to prove the reality of antediluvian writings; but the book cited by that apoſtle is generally allowed both by ancient and modern writers to be ſpurious. See Bible.

Of prophane books, the oldeſt extant are Homer's poems, which were even ſo in the time of Sextus Empiricus: though we find mention in Greek writers, of about ſeventy others prior to Homer; as Hermes, Orpheus, Daphne, Horus, Linus, Muſæus, Palamedes, Zoroaſter, &c. but of the greater part of theſe, there is not the leaſt fragment remaining; and of the others, the pieces which go under their names are generally held by the learned ſuppoſititious. F. Hardouin goes farther: charging all the ancient books, both Greek and Latin, except Cicero, Pliny, Virgil's Georgics, Horace's Satires and Epiſtles, Herodotus, and Homer, as ſpurious, and forged in the thirteenth century, by a club of perſons under the direction of one Severus Arcontius. Fab. Bib. Græc. lib. i. cap. 1. § 1. § 6. tom. i. Hardouin de Num. Herod. in Proluſ. Act. Erud. Lipſ. an. 1710. p. 70.

Among the Greeks, it is to be obſerved, the oldeſt books were in verſe, which was prior to proſe; Herodotus's hiſtory is the oldeſt book extant of the proſaic kind. Strabo. Geog. lib. i. Heuman. Via ad Hiſt. Liter. § 20. p. 50. § 21. p. 52.

Books, *the multitude of*, has been long complained of: the complaint is as old as Solomon, who lived three thouſand years ago: they are grown too numerous, not only to procure and read, but to ſee, to learn the names of, or even to number. England has more to fear on this ſcore, than other countries; ſince, beſides our own produce, we have, for ſome years paſt, drained our neighbours. However, as biſhop Caramuel's ſcheme miſcarried, which was to write about a hundred volumes in folio, and then prevail on the civil and military powers to oblige all their ſubjects to read them, we need not much regret the multitude of books.

In reality, there are few of the immenſe number of books which deſerve ſeriouſly to be ſtudied: for the reſt, part of them, like this, are only to be occaſionally conſulted, and the reſt read for amuſement. A mathematician, for inſtance, ought not to be entirely ignorant of what is contained in the mathematical books: but then a general knowledge is ſufficient, which may eaſily be had by running over the chief authors; out of whom references may be made, directing to the places where they may be found, when wanted. For there are many things which are much better preſerved in books than in the memory; as aſtronomical obſervations, tables, rules, theorems, proportions, and in fine, whatever does not ſpontaneouſly adhere to the memory, when once known. For the leſs we croud that faculty, the readier and freer will the genius remain for inventing.

Other books may be valuable in themſelves, for ſome ſpecial purpoſe, or in ſome peculiar ſcience, but are not fit to be peruſed except by thoſe who are engaged in that particular ſcience, or buſineſs. To what uſe is it for a divine, or a phyſician, or a tradeſman, to read over the huge volumes of reports of adjudged caſes in the law? Or for a lawyer to learn Hebrew and read the Rabbins, unleſs his inclination leads him, and his leiſure allows him to employ himſelf in this way? For improvement of knowledge and ſaving of time, it is of great importance for young perſons to have the moſt proper books for his reading, recommended by a judicious friend.

Books of importance of any kind, and eſpecially complete treatiſes on any ſubject, ſhould be firſt read in a more general and curſory manner, to learn in ſome degree what the treatiſe promiſes, and what you may expect from the writer's manner and ſkill. For this purpoſe let the preface be read, and the table of contents, if there be any, before this firſt ſurvey of the book. By this means you will not only be better fitted to give the book a firſt reading, but be much aſſiſted in a ſecond peruſal of it, which ſhould be done with greater attention and deliberation, and you will learn with more eaſe and readineſs what the author profeſſes to teach. In reading it will be uſeful to mark what is new or unknown to you before, and to review thoſe chapters, pages, or paragraphs. Unleſs a reader has an uncommon and moſt retentive memory, we may venture to affirm, that there is ſcarcely any book or chapter worth reading once, that is not worthy of a ſecond peruſal. At leaſt it will be proper carefully to review all the lines or paragraphs which were previouſly marked, and to recollect the ſections which were thought truly valuable. There is another reaſon why it will be uſeful to take a ſuperficial and curſory ſurvey of a book, before we ſit down to read it, and to dwell upon it with ſtudious attention; and that is, that there may be ſeveral difficulties in it, which we cannot eaſily underſtand and reſolve at the firſt reading, for want of a fuller comprehenſion of the author's whole ſcheme. Many ſuch difficulties would be unravelled when we have proceeded farther in ſuch books, or would vaniſh themſelves upon a ſecond reading. What we cannot thoroughly underſtand at firſt may be noted down as matter of ſubſequent conſideration and inquiry, if the pages that follow do not happen to ſtrike a complete light on thoſe which went before. In peruſing books that treat of ſubjects of natural, moral, or divine ſcience, it ſhould be conſidered that it is our buſineſs, not merely to know the opinion of the author, for this is but the mere knowledge of hiſtory; but truly to reflect, whether his opinions are juſt or not, and to improve our own knowledge of the ſubject by a careful inveſtigation of it. With this view we ſhould deal freely with every author whoſe works we read, and yield our aſſent only to evidence and juſt reaſoning. If a writer on any particular ſubject, to which your attention is directed, maintains ſentiments ſimilar to your own, but does not explain his ideas, or prove his poſitions to your ſatisfaction, mark his defects, or faults, and endeavour to do it better, either in the margin of your book, or rather on ſome papers of your own. e. g. When the author is obſcure, enlighten him; where he is imperfect, ſupply his deficiencies; where he is too conciſe, amplify, and ſet his notion, in a fairer view; where he is redundant, mark the paragraphs that ought to be retrenched; where he trifles and indulges to impertinence, abandon thoſe paſſages, or pages; where he argues, obſerve whether his reaſons be concluſive; if the concluſion be true, but the argument weak, endeavour to confirm it by better proofs; where he deduces any propoſitions obſcurely, or doubtfully, make the juſtneſs of the inference to appear, and add further inferences or corollaries, if ſuch occur to your mind; where you ſuppoſe he is miſtaken, propoſe your objections, and correct his errors; what he writes ſo well as to approve itſelf to your judgment, as both juſt and uſeful, treaſure up in your memory, and count it a part of your intellectual gains. If the method of a book be irregular, reduce it into form,

by

by an analysis of your own, or by hints in the margin; if those things are heaped together, which should be separated, distinguish and divide them. If several things relating to the same subject are scattered through various parts of the same treatise, let them be brought together into one view, by suitable references; or if the matter of a book be really valuable and deserving the labour, you may arrange it in a better method, reduce it to a more logical scheme, or abridge it into a lesser form. All these practices will have a tendency to advance your own skill in logic and method, to improve your judgment in general, and to give you a more comprehensive survey of that subject in particular. When you have finished the treatise, with all your observations upon it, recollect and determine what real improvements you have made by reading that author. If a book have no index, or good table of contents, it is useful to make such as you are reading it; taking notice merely of those parts which are new and well written, and well worthy of remembrance, or review. If the writer be remarkable for any peculiar excellencies, or defects in his style, or manner of writing, attentively observe them, and whatever ornaments or blemishes occur in the language, or manner of the writer, you may make just remarks upon them. One book perused in the manner now proposed, will tend more to enrich the understanding, than skimming over the surface of 20 authors. "There are many who read," says the excellent author of whose useful observations we are now availing ourselves, (see Watts's Improvement of the Mind) "with constancy and diligence, and yet make no advances in true knowledge by it. They are delighted with the notions which they read, or hear, as they would be with stories that are told, but they do not weigh them in their minds as in a just balance, in order to determine their truth, or falshood; they make no observations upon them, or inference from them. Perhaps their eye slides over the pages, or the words slide over their ears, and vanish like a rhapsody of evening tales, or the shadows of a cloud flying over a green field in a summer's day; or, if they review them sufficiently to fix them in their remembrance, it is merely with a design to tell the tale over again, and to shew what men of learning they are. Thus they dream out their days in a course of reading without real advantage. As a man may be eating all day, and for want of digestion is never nourished; so these endless readers may cram themselves in vain with intellectual food, and without real improvement of their minds, for want of digesting it by proper reflection."

"Never apply yourselves," says the same writer, "to read any human author with a determination, before-hand, either for or against him, or with a settled resolution to believe, or disbelieve, to confirm, or oppose whatsoever he saith; but always read with a design to lay your mind open to truth, and to embrace it wheresoever you find it, as well as to reject every falshood, though it appear under never so fair a disguise. How unhappy are those men, who seldom take an author in their hands, but they have determined before they begin, whether they will like or dislike him! They have got some notion of his name, his character, his party, or his principles, by general conversation, or perhaps by some slight view of a few pages; and having all their own opinions adjusted before-hand, they read all that he writes with a prepossession either for or against him: unhappy those who hunt and purvey for a party, and scrape together out of every author, all those things, and those only which favour their own tenets, while they despise and neglect all the rest!" The author subjoins an useful caution; and wishes not to be understood, as persuading a person to live without any settled principles, by which to judge of books, men, and things, or to be always doubting about his foundations. But having settled, upon good grounds, the most necessary and important principles of science, prudence, and religion, we should read, with a just freedom of thought, all those books which treat of such subjects as may admit of doubt, or reasonable dispute. When we peruse those authors who defend our own settled sentiments, we should not hastily conclude that all their reasonings are just and solid; nor eagerly embrace all their lesser opinions, because we agree with them in the greater. When we read those authors who oppose our most certain and established principles, we should be ready to receive any information from them in other points, and not abandon every thing they say, though we are well fixed in opposition to their main object:

"Seize upon truth where-e'er 'tis found,
Amongst your friends, amongst your foes,
On Christian, or on heathen ground;
The flower's divine where-e'er it grows;
Neglect the prickles, and assume the rose."

Upon the plan of reading above stated and recommended, a few books well chosen, and thoroughly studied, may suffice. It may be added, that as knowledge is naturally advantageous, and as every man ought to be in the way of information, even a superfluity of books is not without its use, since hereby they are brought to obtrude themselves on us, and engage us when we had least design. This advantage, an ancient father observes, we owe to the multiplicity of books on the same subject, that one falls in the way of one man, and another best suits the level, or the apprehension, of another. "Every thing that is written," says he, "does not come into the hands of all persons: perhaps some may meet with my books, who may hear nothing of others which have treated better of the same subject. It is of service, therefore, that the same questions be handled by several persons, and after different methods, though all on the same principles, that the explications of difficulties, and arguments for the truth, may come to the knowledge of every one, by one way or other." Add, that the multitude is the only security against the total loss or destruction of books: it is this that has preserved them against the injuries of time, the rage of tyrants, the zeal of persecutors, and the ravages of barbarians; and handed them down, through long intervals of darkness and ignorance, safe to our days. "Solaque non norunt hæc monumenta mori." Bac. de Augm. Sc. lib. i. August. de Trin. lib. i. cap. 3. Barthol. lib. cit. Diff. i. p. 8, &c.

Books, *the scarcity of*, is an evil much more to be lamented, in the survey of past ages, than their multitude at any later period. Before the art of printing was invented, the trouble and expence of procuring copies very much retarded the progress of literature. The universal ignorance that prevailed in Europe, from the seventh to the eleventh century, may be ascribed to the scarcity of books during that period, and the difficulty of rendering them more common, concurring with other causes arising from the state of government and manners. The Romans wrote their books either on parchment, or on paper made of the Egyptian papyrus. The latter, being the cheapest, was of course the most commonly used. But after the Saracens conquered Egypt, in the seventh century, the communication between that country and the people settled in Italy, or in other parts of Europe, was almost entirely broken off, and the papyrus was no longer in use among them. They were obliged on that account to write all their books upon parchment; and as the price of that was high, books became extremely rare and of great value. We may judge of the scarcity of materials for writing them from one circumstance.

There ſtill remain ſeveral manuſcripts of the 8th, 9th, and following centuries, wrote on parchment, from which ſome former writing had been eraſed, in order to ſubſtitute a new compoſition in its place. Thus, it is probable, ſeveral of the works of the ancients periſhed. A book of Livy or of Tacitus might be eraſed, to make room for the legendary tale of a ſaint, or the ſuperſtitious prayers of a miſſal. As the want of materials for writing accounts for the loſs of many of the works of the ancients, and for the ſmall number of MSS. previous to the 11th century, many facts prove the ſcarcity of books at this period. Private perſons ſeldom poſſeſſed any books whatever; and even monaſteries of note had only one miſſal. Towards the end of the ſeventh century, even in the papal library at Rome, the number of books was ſo inconſiderable, that pope St. Martin requeſted Sanctamand, biſhop of Maeſtricht, if poſſible, to ſupply this defect from the remoteſt parts of Germany. In the year 855, Lupus, abbot of Ferrieres in France, ſent two of his monks to pope Benedict III. to beg a copy of Cicero de Oratore and Quintilian's Inſtitutes; "for," ſays the abbot, "although we have part of theſe books, there is no complete copy of them in all France." At the beginning of the tenth century books were ſo ſcarce in Spain, that one and the ſame copy of the bible, Jerome's epiſtles, and ſome volumes of eccleſiaſtical offices and martyrologies, often ſerved ſeveral different monaſteries. Among the conſtitutions given to the monks of England by archbiſhop Lanfranc, in 1072, the following injunction occurs: At the beginning of Lent, the librarian is ordered to deliver a book to each of the religious, for the peruſal of which a whole year was allowed; and at the returning Lent, thoſe monks who had neglected to read the books they had reſpectively received, are commanded to proſtrate themſelves before the abbot, and ſupplicate his forgiveneſs. In 1299, John de Pontiſſara, biſhop of Wincheſter, borrows of his cathedral convent of St. Swithin, at Wincheſter, "bibliam bene gloſſatam," that is, the bible, with marginal annotations, in two folio volumes; but gives a bond for the return of it, drawn up with great ſolemnity. For the bequeſt of this bible to the convent, and 100 marks, the monks founded a daily maſs for the ſoul of the donor. If any perſon gave a book to a religious houſe, he believed, that ſo valuable a donation merited eternal ſalvation, and he offered it on the altar with great ceremony. The prior and convent of Rocheſter declare, that they will every year pronounce the irrevocable ſentence of damnation on him, who ſhall purloin or conceal a Latin tranſlation of Ariſtotle's Poetics, or even obliterate the title. Sometimes a book was given to a monaſtery, on condition that the donor ſhould have the uſe of it for his life; and ſometimes to a private perſon, with the reſervation that he who receives it ſhould pray for the ſoul of his benefactor. In the year 1225, Roger de Inſula, dean of York, gave ſeveral Latin bibles to the univerſity of Oxford, on condition that the ſtudents who peruſed them, ſhould depoſit a cautionary pledge. The library of that univerſity, before the year 1300, conſiſted only of a few tracts, chained or kept in cheſts, in the choir of St. Mary's church. Among the ſtatutes of St. Mary's college at Oxford, in 1446, one is, that no ſcholar ſhould occupy a book in the library above one hour, or two hours at moſt, ſo that others ſhall be hindered from the uſe of the ſame. The famous library eſtabliſhed in the univerſity of Oxford by Humphrey duke of Glouceſter, a munificent patron of literature, contained only 600 volumes. About the beginning of the 14th century, there were only four claſſics in the univerſity of Paris, which were ſingle copies of Cicero, Ovid, Lucan, and Boethius.

The price of books became ſo high, that perſons of a moderate fortune could not afford to purchaſe them. In the year 1174, Walter, prior of St. Swithin's at Wincheſter, purchaſed of the monks of Dorcheſter, in Oxfordſhire, Bede's homilies and St. Auſtin's pſalter for twelve meaſures of barley and a pall, on which was embroidered in ſilver the hiſtory of St. Birinus converting a Saxon king. About the year 1400, a copy of John of Meun's "Roman de la Roſe" was ſold before the palace-gate at Paris for 40 crowns, or 33l. 6s. 6d. The counteſs of Anjou paid, for a copy of the homilies of Haimon, biſhop of Halberſtadt, 200 ſheep, five quarters of wheat, and the ſame quantity of rye and millet. Even ſo late as the year 1471, when Louis XI. of France borrowed the works of Rhaſis, the Arabian phyſician, from the faculty of medicine at Paris, he not only depoſited by way of pledge a conſiderable quantity of plate, but he was obliged to procure a nobleman to join with him as ſurety in a deed, binding himſelf under a great forfeiture to reſtore it. Many other inſtances might be cited, in order to ſhew how ſcarce books were at the period to which we now refer, and with what difficulty, and at what extravagant prices, copies of them were procured; and therefore we can be at no loſs in accounting for the extreme ignorance that prevailed. But when, in the 11th century, the art of making paper was invented, and more eſpecially after the manufacture became general, the number of MSS. increaſed, and the ſtudy of the ſciences was wonderfully facilitated. Indeed, the invention of the art of making paper, and the invention of the art of printing, are two very memorable events in the hiſtory of literature and of human civilization. It is remarkable, that the former preceded the firſt dawning of letters and improvement in knowledge, towards the cloſe of the eleventh century; and the latter uſhered in the light which ſpread over Europe at the æra of the reformation. Murat. Antiq. Ital. vol. iii. vol. ix. Mem. de l'Acad. des Inſcrip. tom. ix. Hiſt. Lit. de France, par des Religeux Benedictins, tom. vii. Naudé Addit. a l'hiſtoire de Louis XI. par Comines, ed. Freſnoy, tom. iv. Robertſon's Hiſt. Ch. v. vol. i. Wharton's Eng. Poetry, vol. i. diſſ. 2.

Books, *to form a judgment of.* Thoſe who have treated of the ſubject, direct us to obſerve the title, the author's or editor's name, the number of the edition, the place where and the year when it is printed (which in old books is frequently marked at the end), and the printer's name, eſpecially if it be a celebrated one; proceed then to the preface, and index of contents, and look for the author's deſign, and the occaſion of his writing; conſider alſo his country (each nation having its peculiar genius), which may ſometimes be learned from the dedication; if his life be annexed, run it over, and note his profeſſion, what rank he was of, and any thing remarkable that attended his education, ſtudies, converſation, or correſpondences with learned men; not forgetting the eulogies which have been given to the author, which often occur at the beginning, or even any critique or cenſure, eſpecially if made by a man of judgment. If the preface does not give an account of the method of the work, run briefly over the order and diſpoſition of it, and note what points the author has handled; obſerve whether the things and ſentiments he produces be trite and vulgar, or ſolid, and fetched from greater depths. Note, whether he go in the common road, or make any innovation, and introduce any new principle.

But it is a ſmall number of books we have opportunity of thus judging of by peruſing them; beſides, when we have read a book over, the judgment comes too late for many purpoſes. Life is too ſhort, and time is too precious, to read every new book quite over, in order to find that it is

not worth reading. It seems necessary, therefore, to have other indications, whereby to prevent our being at the charge of procuring, or the pains of perusing a worthless book. Divers rules of this kind are given by Baillet, Struvius, Stollius, and others; which, though in reality no more than presumptions, and frequently liable to be falsified, are not without their use. The journalists de Trevoux objected to them all: "The shortest way," say they, "to judge of a book is to read it, if you be qualified in the subject; otherwise to refer yourself to those who are so." Heuman is somewhat more explicit; making it a mark that "a book is good, when it is esteemed by persons intelligent in the subject it treats of; and when those who commend it receive no advantage from the applause they bestow on it, nor are leagued with the author in any cabal, for espousing any particular principle, system, or party, in religion or learning." Baillet, Jugem. des Sçav. tom. i. b. ii. p. 121. Struv. Introd. ad Not. Rei Liter. cap. 5. § 3. p. 390. Stoll. Introd. Hist. Liter. p i. § 11. p. 9. Budd. de Criteriis boni libri, passim. Mem. de Trev. an. 1712. Art. 17. Heuman. Consp. Reipubl. Liter. cap. vi. § 11. p. 280.

But more particularly, it is an indication that a book is good; 1. If the author be known to excel in that talent more immediately necessary for such a subject; or have already published any thing on the same that is esteemed. Thus we may conclude, that Julius Cæsar will teach us the art of war better than Peter Ramus; Cato, Palladius, and Columella, agriculture better than Aristotle; and Cicero, oratory better than M. Varro: add, that it is not enough the author be skilled in the faculty, but that he be so in the particular branches of it, concerning which he treats; some, for instance, excel in the civil law, yet not in the public law; Salmasius proved himself an excellent critic in his Exercitat. Plinian. but was much inferior to Milton in his Defensio Regia. 2. If the book be on a subject that requires great reading, it may be presumed good, if the author had a copious library, or could have access to one; or if he lived in a place where books were not wanting; though here is danger too of running into excess of quotations; especially, says Struvius, if the author be a lawyer. 3. A book which took up a long time in composing, cannot often fail of being good. 4. Books on points of doctrine by eclectic writers, are to be presumed better than those writ by the retainers to particular sects. 5. The age of a writer may also give us some indication: books, which require labour, are usually better performed by younger persons than those who are far advanced in years. 6. Another indication may be taken from the author's state and condition: thus, history written by a person who was an eye-witness to what he relates, or is concerned in public affairs, or has access to the public records, or other monuments, from whence intelligence may be drawn; who is not biassed by party, or any other indirect or sinister motive, will be supposed to be good. Thus Sallust and Cicero were well able to write the history of Cataline's conspiracy. D'Avila, de Comines, Guicciardin, Clarendon, &c. were present in the civil wars they describe; Xenophon, having an employment in the Spartan state, has treated excellently of that commonwealth; and Amelot de la Houssaye, by living long at Venice, was enabled to explain the secrets of their policy. Camden wrote annals of the affairs of his own time; Thuanus had correspondence with the best writers in every country; and Pussendorf had access to the public archives. So, in literary matters, we give credit to those who have the direction of libraries. 7. The time or age wherein the author lived may give some light; every age having, according to Barclay, its peculiar genius and excellency. See Bartholin. Struv. Budd Heuman. Baill. lib. cit.

Some judge by the bulk or size of books; following the grammarian Callimachus's rule, that every great book is of course an ill one, μεγα βιβλιον, μεγα κακον; a single leaf of the Sybil was doubtless preferable to the vast annals of Volusius: yet Pliny's observations will nevertheless hold true, that "a good book is so much the better by how much it is bigger." Plin. Epist. 20. lib. i. Martial prescribes a remedy against the largeness of a book, when that is the only complaint, read but a little of it:

"Si nimius videar, seraque coronide longus
Esse liber, legito pauca, libellus ero."

Yet is the smallness of a book a real presumption in its favour: he must be a poor author, who cannot furnish a pamphlet, or loose sheet, with things curious, and written with spirit; but to support the same through a volume in folio, requires very extraordinary abilities indeed. Addis. in Spec. N° 124.

There are some general mistakes, which persons are frequently guilty of in passing judgment on the books which they read. One is, when a treatise is written but tolerably well, we are ready to pronounce a favourable judgment of it, and sometimes to exalt its character far beyond its merit, if it agree with our own principles and support the opinions of our party. On the other hand, if the author be of different sentiments, and espouse contrary principles, we can find neither wit nor reason, good sense, nor good language in it. For avoiding or correcting this error, it should be considered, that books are never to be judged of merely by their subject, or the opinion they represent, but by the justness of their sentiments, the beauty of their manner, the force of their expression, or the strength of reason, and the weight of just and proper argument, which appear in them. Another mistake, which some persons fall into, is this: When they read a treatise on any subject, with which they have but little acquaintance, they find almost every thing new and strange to them, their understandings are much gratified and improved by many things unknown to them before; and hence they are led to admire the treatise, and commend the author: whereas, if they had previously attained a considerable degree of skill in that science, perhaps they would have found that the author had written very indifferently, that neither his sense nor his method was just and proper, and that he delivered nothing that was not very common or very trivial, in his discourses on that subject. On the other hand, if we have made ourselves masters of any particular theme of knowledge, and surveyed it long on all sides, there is scarcely any writer who much pleases us afterwards, because we find little or nothing new in him; and yet in a true judgment perhaps his sentiments are unexceptionably just, his illustrations clear, and his reasonings forcible, and all the parts of the discourse are well connected and set in a happy light; but we knew most of these things before, and therefore they do not strike us, and we are in danger of discommending them. There are some other follies into which persons are apt to be betrayed in forming their judgment of books. Some persons, who are of a forward and lively temper, and who are fond of intermeddling with all appearances of knowledge, will give their judgment of a book as soon as the title of it is mentioned, for they would not seem ignorant of any thing that others know; and especially, if they happen to have any superior character or possessions, they fancy they have a right to talk freely and to pronounce magisterially on every thing, even of a literary kind, that occurs. Thus, blind men will talk of the beauty

beauty of colours, and of the harmony or disproportion of figures in painting; the deaf will prate of discords in music; and those who have no pretensions to literature, will pronounce, with an unpardonable presumption, on books of science; and those who have little or no acquaintance with either the speculative or practical principles of religion, will arraign the best treatise on divine subjects, though they do not understand the very language of the Scripture, nor the common terms or phrases used in Christianity. Judges of another description set themselves up to decide in favour of an author, or against him, according to the company they have kept, and the judgment pronounced concerning a book by others of their own stamp or size, though they have no knowledge or taste of the subject themselves. These, with a fluent and voluble tongue, become mere echoes of the praises or censures of other men. Others, again, pass judgment from the secret stimulations of vanity, pride, or envy; and in order to justify an unwarrantable and severe censure, they will allege a mistake or two, which they have discovered, or a few sentiments and expressions not suited to their capricious taste and humour. It is, however, an indication of perverseness and prejudice, to rail at any human performance because it is not absolutely perfect. Horace has given us a better example:

"Sunt delicta tamen, quibus ignovisse velimus:
Nam neque chorda sonum reddit, quem vult manus, et mens,
Poscentique gravem persæpe remittit acutum;
Nec semper feriet quodcunque minabitur arcus
Verum, ubi plura nitent in carmine, non ego paucis
Offendar maculis, quas aut incuria fudit,
Aut humana parum cavit natura."— De Art. Poet.

"Be not too rigidly censorious:
A string may jar in the best master's hand,
And the most skilful archer miss his aim;
So in a poem elegantly writ,
I will not quarrel with a small mistake,
Such as our nature's frailty may excuse." ROSCOMMON.

Another, and very frequent fault in passing judgment upon books, is this, that persons spread the same praises, or the same reproaches, over a whole treatise, which are justly applicable only to some detached parts of it. After all, when any person pretends to give his judgment of a book, we should consider whether he be a capable judge, or whether he may not lie under some unhappy bias or prejudice, for or against it, or whether he has made a sufficient inquiry to enable him for forming a just opinion. Watts's Improvement of the Mind apud Works, vol. v. ch. 4—5.

See farther concerning books, in the writers on literary history, libraries, studies, learning, arts, and sciences; more especially in Salden, Bartholin, Hodannus, Sacchinus, Baillet, Buddeus, Saalbach, Putherbeus, Raynaud, Schufner, Laauffer, Schwartzius, Crenius, Morhoff, and others, who have written treatises express concerning books. Christ. Liberius, i. e. Gul. Saldenus, βιβλιοφιλια, *sive de Libris scribendis et legendis*, Ultraj. 1681. 12mo. et Amstel. 1688, 8vo. Struv. Introd. ad Hist. Liter. c 5. § 21. p. 454. Th. Bartholin. de Libris legendis, 1678, 8vo. & Francof. 1711, 12mo. Struv. loc. cit. Jo. Fred. Hodanni Differt. de Libris legendis, Hanov. 1705, 8vo. Fr. Sacchini de Ratione Libros cum profectu legendi, Lipf. 1711, 12mo. Baillet, Jugemens des Sçavans sur les principaux Ouvrages des Auteurs, tom. i. Car. Frid. Buddeus, de Criteriis boni Libri, Jen. 1714. Chr. Saalbach. Schediasma de Libris veterum, Gryphis, 1705, 4to. Fabric. Bibl. Ant. cap. 19. § 7. p. 607. Reimm. Idea Syst. Antiq. Liter. p. 229, seq. Gab. Putherbeus, de tollendis et expurgandis malis Libris, Par. 1549, 8vo. Theoph. Raynaud. Erotemata de bonis ac malis Libris, Ludg. 1653, 4to. Morhof. Polyhist. Liter. lib. i. cap. 16. n. 28. p. 177. Schufner, Differt. Acad. de Multitudine Librorum, Jenæ, 1702, 4to. Lauffer, Differt. adverf. nimiam Librorum Multitudinem. Vide Jour. des Sçavans, tom. lxxv. p. 572. Chr. Got. Schwartzius, de Ornamentis Librorum apud Veteres, Lipf. 1705 and 1707. Tho. Crenius, de Libris Scriptorum optimis et utilissimis. Lugd. Bat. 1704, 8vo.; an extract of which is given in Act. Erud. Lipf. an. 1704, p. 526, & seq.

The importation or sale of mass-books, or other popish books, is by stat. 3 Jac. I. c. 5. § 25. liable to a penalty of forty shillings.

The importation of books first printed in this kingdom, and reprinted abroad, is prohibited under a penalty of 5l. and double the value of every book so imported and sold. Vide stat. 12 Geo. II. c. 36. § 1.

There was a clause in the statute of the 8th of queen Anne, c. 19. empowering the chancellor, and some other great officers of state, to set the price of books; but this is now repealed by 12 Geo. II. c. 36. § 2.

The sole right of printing books bequeathed to the two universities of England, the four universities of Scotland, and the colleges of Eton, Westminster, and Winchester, are secured to them by stat. 15 Geo. III. c. 53. See LITERARY *Property*.

BOOKS, *burning of*, was a kind of punishment sanctioned, both among the Greeks and Romans, by legal sentence. At Athens, the works of Protagoras were prohibited; and all the copies of them which could be collected, were burnt by the public cryer. Diogenes Laert. l. ix. 52. At Rome, the writings of Numa, which had been found in his grave, were, by order of the senate, condemned to the fire, because they were contrary to the religion which he had introduced. Liv. l. xl. c. 29. Plin. xiii. 13. Plutarch. in vit. Numæ. As the populace of Rome were, in times of public calamity, more addicted to superstition than seemed proper to the government, an order was issued that all superstitious and astrological books should be delivered into the hands of the prætor. This order was often repeated; and the emperor Augustus caused more than 20,000 of these books to be burned at one time. Liv. l. xxv. c. 1. l. xxxix. 16. Tacit. Annal. vi. 12. Sueton. l. ii. c. 31. Sometimes the care of the execution of the sentence for burning books was committed to *triumviri* appointed on purpose; sometimes to the prætors; and sometimes to the ædiles. Labienus, whom from his satirical spirit some have called *Rabienus*, is said to have been the first who underwent the severity of it, under the emperor Augustus. His enemies procured a *senatusconsultum*, whereby all his books, published during several years, were ordered to be collected and burnt. The thing, says Seneca, (in the introduction to the fifth, or, as others reckon, the 10th book of his "Controversiæ,") then appeared new and strange to take revenge on learning! "Res nova et insueta, supplicia de studiis sumi!" Cassius Severus, a friend of Labienus, hearing the sentence pronounced, cried aloud, that they must burn him too, since he had got all the books by heart; "Nunc me vivum uri oportet, qui illos edidici." Labienus could not survive his books; but shutting himself up in the tomb of his ancestors, pined away, and was buried alive. It is related as somewhat singular, that a few years after, the writings of the person, who had been the cause of the order for burning Labienus's books, shared the like fate, and were also publicly burned. In a manner somewhat similar, the works of Ben-Arias Montanus, who assisted to make the first catalogue of prohibited books, in the Netherlands,

therlands, were afterwards inferted in a catalogue of the fame kind. The expreffion of Caffius above cited gave occafion to a law of Auguftus againft abufive writings. Tacit. Annal. l. i. c. 72. When Cremutius Cordus, in his Hiftory, called C. Caffius the laft of the Romans, the fenate, in order to flatter Tiberius, caufed the book to be burned; but a number of copies were concealed and preferved from the flames. Tacit. Annal. l. iv. c. 35. Antiochus Epiphanes caufed the books of the Jews to be burned; and in the firft centuries of our æra, the books of the Chriftians were treated with equal feverity, of which Arnobius (Adv. Gentes, l. iii, & iv.) bitterly complains. Eufebius informs us (Hift. Eccl. l. viii. c. 2.), that Diocleftan caufed the facred fcriptures to be burned. After the fpreading of the Chriftian religion, the clergy exercifed againft books that were either unfavourable or difagreeable to them, the fame feverity which they had cenfured in the heathens as foolifh and prejudicial to their own caufe. Thus, were the writings of Arius condemned to the flames at the council of Nice; and Conftantine threatened with the punifhment of death thofe who fhould conceal them. Socrates, l. i. c. 6. The clergy affembled at the council of Ephefus, requefted the emperor Theodofius II. to caufe the works of Neftorius to be burned, and their requeft was complied with. Cod. l. i. tit. 5, 6. The writings of Eutyches fhared the like fate at the council of Chalcedon; and the fame practice of burning books thought to be heretical with regard to religion, or injurious to the ftate in a political view, has been imitated in fubfequent ages, and in various nations even of the Chriftian world.

Divers other ancient teftimonies concerning the burning of books are given in Reimm. Idea Syft. Antiq. Liter. p. 389.

Books, *Catalogue of*. See Catalogue.

Books, *Cenfors of*. See Censor.

Books, *Privilege of*. See Privilege.

Books, *whitening of*. The following procefs for whitening prints, printed books, and paper, has been announced and defcribed by M. Chaptal. Simple immerfion in oxygenated muriatic acid, for a longer or fhorter fpace of time, according to the ftrength of the liquid, will fuffice to whiten an engraving. But in whitening the paper of a bound book, it is neceffary that all the leaves fhould be moiftened by the acid, and therefore the book muft be well opened, and the leaves feparated; and the boards muft be made to reft on the edge of the veffel containing the whitening liquor. This liquor in the procefs affumes a yellow tint, and the paper becomes proportionably white. At the end of two or three hours, the book may be taken from the acid liquor and plunged into pure water; and the water fhould be renewed every hour to extract the remaining acid, and to diffipate the difagreeable fmell. In order to render this procefs more effectual, the book-binders deftroy the binding, unfew the book, and feparate its leaves; they then place thefe in cafes formed in a leaden tub, with very thin flips of wood or glafs, fo that the leaves may lie flat and feparate from one another at very fmall intervals. The acid is then gently poured into the tub, without deranging the leaves. When the paper is become fufficiently white, the acid liquor is drawn off by a cock at the bottom of the tub; and its place is fupplied by clear, frefh water. The leaves are then dried, and, after being preffed, re-bound. The leaves may with greater advantage be placed vertically in the tub. With this view, M. Chaptal conftructed a wooden frame, adjufted to the proper height, according to the fize of the leaves propofed to be whitened. This frame fupported very thin flips of wood, at the diftance from one another of half a line. In each of thefe intervals he placed two leaves, and kept them fixed in their place by two fmall wooden wedges, pufhed in between the flips. When the paper was whitened, he lifted up the frame with the leaves, and plunged them into cold water, to take off the remaining acid, as well as the fmell. By this operation books are not only cleaned, but the paper acquires a degree of whitenefs fuperior to what it poffeffed when firft made. This acid will alfo ferve to deftroy ink fpots; but it has no action upon fpots of oil, or animal greafe; however, a weak folution of pot-afh will effectually remove ftains of that kind. To oxygenate the muriatic acid, it is only neceffary to dilute it, and mix it in a very ftrong glafs veffel with manganefe, in fuch a manner that the mixture may not occupy the whole content of the glafs. Air-bubbles are formed upon the furface of the liquor; the empty fpace is filled with a greenifh vapour; and, at the end of fome hours, the acid may be further diluted with water, and then ufed. In order to remove fpots of greafe from books and prints, M. Defchamps, member of the Philofophical Society at Lyons, recommends to take out as much as poffible of it by means of blotting paper; and then to dip a fmall brufh in the effential oil of well rectified fpirit of turpentine, heated almoft to ebullition, and draw it gently over both fides of the paper, which muft be carefully kept warm. This operation muft be repeated as often as the quantity of greafe imbibed by the paper, or the thicknefs of the paper, may render neceffary. When the greafe is entirely removed, the paper may be reftored to its former whitenefs, by dipping another brufh in highly rectified fpirit of wine, and drawing it, in like manner, over the place which was ftained, and particularly round the edges, to remove the border that would ftill prefent a ftain. Bibliotheque Economique, vol. i. See Bleaching.

Book, *common-place*. See Common-Place.

Book, *text*. See Text.

Book, is alfo ufed for a part or divifion of a volume, or large work.

In this fenfe we fay the book of Genefis, the firft book of Kings, the five books of Mofes, &c.—The Digeft is contained in fifty books, the Code in twelve books.

Books are ufually fubdivided into chapters, fometimes into fections, or paragraphs: accurate writers quote chapter and book.

Book is alfo ufed for a lift or catalogue of perfons' names. —Such among the ancients were the *cenforial books*, being tables or regifters containing the names of all thofe who were cenfed or taxed under Auguftus. Tertullian affures us, that our Saviour's name was found in the cenforial book of Auguftus. Adv. Marcion. lib. iv. cap. 7. See Census.

Books, in *Matters of Commerce*, denote the feveral regifters wherein merchants and other dealers keep their accounts. Hence *to book*, is to regifter in a book.

We fay, fuch a perfon's books are in good order; merchants cannot poffibly do without books; they are even obliged by the laws to keep books. But more or fewer are required, according to the nature or extent of their dealings, or the precifion and exactnefs they defire therein.

The ancients had alfo their books of accounts; witnefs the *codex accepti & expenfi*, fo often mentioned in Roman writers; and the *patrimonial* books, which were rentals, containing an account of the lands, goods, and chattels, and other effects belonging to each perfon.

Among the defects to which the trial by jury is fubject, one is the want of a compulfive power for the production of books and papers belonging to the parties. In the hands of third perfons, they can generally be obtained by rule of court, or by adding a claufe of requifition to the writ or "fubpœna," which is then called a "fubpœna duces tecum." But,

But, in mercantile tranſactions eſpecially, the ſight of the party's own books is frequently deciſive; as the day-book of a trader, when the tranſaction was recently entered, as really underſtood at the time; though ſubſequent events may tempt him to give it a different colour. And, as this evidence may finally be obtained, and produced on a trial at law, by the circuitous courſe of filing a bill in equity, the want of an original power for the ſame purpoſes in the courts of law is a material defect.

Book-binding, the art of ſewing together the ſheets of a book, and ſecuring them with a back, and ſtrong paſteboard ſides, covered with leather, &c.

Binding is diſtinguiſhed from ſtitching, as in the latter the leaves are only ſewed, without bands or backs.

We ſay, French-*binding*, law-*binding*, marble-*binding*, *binding* in parchment, in ſheep, in calves leather, &c. alſo half-*binding*, wherein the leaves are generally left uncut, and only the back covered with leather, the paſteboard ſides being covered with marbled, or blue paper. Dutch-*binding* is where the backs are of vellum. The Italians are ſtill contented to bind in a coarſe, thick paper, called *binding alla ruſtica*, the inconvenience of which is its being liable to wear out without careful uſe. Without doubt, the art of binding is almoſt as ancient as the ſcience of compoſing books; and both the one and the other followed immediately the firſt invention of letters. Whatever the matter might be, on which men firſt wrote, there was a neceſſity of uniting the ſeveral parts together; as well for the making them of one piece, as for the better preſerving them; hence the origin of *book-binding*.

According to Olympiodorus (apud Phot.) it was one Phillatius, a learned man at Athens, who firſt taught the uſe of a kind of glue, to faſten the ſeveral leaves together; on which account a ſtatue was erected to him.

Books, *the manner of binding in volumes*, i. e. of gluing the leaves together; that of rolling them on round pieces, or cylinders of wood, appears the moſt ancient; though that of binding them ſquare, and of ſewing ſeveral quires one over another, lays claim to conſiderable antiquity. The firſt of the two, which we call *Egyptian* binding, held a long time after the age of Auguſtus; but it is now diſuſed, excepting in the Jewiſh ſynagogues, where they continue to write the books of the law on vellum ſewed together; making, as it were, only one long page, with two rollers and their claſps of gold and ſilver, at each extremity.

The form now in uſe is the *ſquare*-binding, which is ſaid to have been invented by one of the Attali, kings of Pergamus; to whom we likewiſe owe the manner of preparing parchment, called in Latin, from the name of his capital, *Pergamena*, or *Charta Pergamea*.

Books, *manner of binding*. The firſt operation is to fold the ſheets according to the form, viz. into two leaves for folios, four for quartos, eight for octavos, &c. which the workmen do with a ſlip of ivory or box, called a *folding-ſtick*; in this they are directed by the catch-words and ſignatures, which are the letters with the numbers annexed to them, at the bottom of the pages. The leaves thus folded, and laid over each other in the order of the ſignatures, are beaten on a ſtone with a heavy hammer to make them ſolid and ſmooth, and then preſſed. Being thus prepared, they are ſewed in a ſewing-preſs, upon pack-threads or cords, which are called bands, at a proper diſtance from each other, and in a convenient number; which is done by drawing a thread through the middle of each ſheet, and giving it a turn round each band, beginning with the firſt, and proceeding to the laſt. The common number of bands is ſix in folios, and five in quartos, octavos, &c. Sometimes they uſe a ſaw to make places for the bands, which are ſunk into the paper, ſo that the back of the book, when bound, is ſmooth, without any appearance of bands. After this the backs are glued, the ends of the bands being opened, and ſcraped with a knife, for the more convenient fixing of the paſte-boards; then the back is turned with a hammer, the book being fixed in a preſs between boards, called *backing-boards*, in order to make a groove for admitting the paſte-boards. The boards being then applied, holes are made for drawing the bands through, the ſuperfluous ends being cut off, and the parts hammered ſmooth. Then the book is preſſed in order for cutting; which is performed by a particular machine called a *plough*, to which is fixed a knife. After this the book is put into a preſs called the *cutting-preſs*, betwixt two boards, the one lying even with the preſs, for the knife to run upon; the other above it, for the knife to cut againſt.

The book being cut, the paſteboards are ſquared with a proper pair of iron ſhears; and it is then ready for ſprinkling, gilding, blacking, or marbling the leaves. The colours with which it is ſprinkled, are uſually vermilion, or ſap-green; which is done with a bruſh made with hog's briſtles, holding the bruſh in one hand, and moving the hair with the other.

In the *French*-binding a book is put in parchment, i. e. a ſlip of parchment is applied over the back between each band, and the ends paſted on the inſide of each paſteboard. This preparation, called *indorſing*, ſeems peculiar to the French binders; who are enjoined by ordonnance to back their books with parchment on the penalty of 30 livres, and the re-binding of the book; it is done in the preſs, where the back being grated to make the paſte take hold, the parchment is applied; and they afterwards add glue to fortify it.

In 1799 a patent was granted to Mr. John Williams and Mr. Joſeph Williams, ſtationers, London, for an improved method of binding all ſorts of books. By the ſpecification it appears, that this invention conſiſts of a back, of a ſemicircular, ſemi-oval, or any other curved form, turned a little at the edges, made of iron, ſteel, copper, braſs, tin, or any other metal, ivory, bone, wood, vellum, paper, leather, or any material capable of retaining a firm ſituation. This back, being put on the book before bound, ſo as juſt to cover but not to preſs the edges of the paper, will, when the book is opened, prevent its ſpreading on either ſide, and cauſe it to riſe in any part which is opened to nearly a level ſurface. This firm back, turned at the edges, ſo as to cauſe all ſorts of books to open freely, is the object of this patent. The method of binding, practiſed by the inventors, is as follows: they forward the paper in the uſual manner; ſew on vellum ſlips, glue, cut, clothe, and board, or half-board; and put on the firm back by faſtening it at the ſides, through holes, by vellum, or ſecuring it by incloſing it in vellum or ferret wrappers, or other matters, paſted down upon, or drawn through the boards. Mr. Ebenezer Palmer, ſtationer of London, obtained a patent in 1800 for an improvement in the mode of binding books, particularly account books of merchants. This conſiſts in the addition of a certain metallic chain, which is made or applied in the following manner: firſt, provide ſeveral ſmall bars of metal, about the thickneſs of a ſhilling, or more, according to the ſize and thickneſs of the book; the length of each bar being from half an inch to ſeveral inches long, in proportion to the ſtrength required in the back of the book. At each end of every bar is made a pivot of different lengths, in proportion to the thickneſs of two links, which they are to receive. Each link is made in an oval form, and contains two holes, proportioned

portioned to the ſizes of the pivots; and theſe links are of the ſame metal as the hinge; each of them being nearly equal in length to the width of two bars. The links are then rivetted on the pivots, each pivot receiving two of them, and thus holding the hinge together, on the principle of a link-chain or hinge. There are further two holes or more of different ſizes, as required in each bar of the hinge or chain, by means of which each ſection of the book is ſtrongly faſtened to the ſame; which hinge, ſo faſtened, operates with the back of the book, when bound, in ſuch manner as to occaſion the ſeveral ſections to open ſo as to bring them on a parallel with each other, and conſequently admit the ruled lines being written into, without any inconvenience, cloſe to the back.

Manner of gilding books on the edges: The book, being put tight into the preſs, between two boards, is ſcraped with a knife called a *ſcraper*; and after that with another called a *ſmoother*, in order to take out all ſcratches. Being thus made ſmooth, they ſcrape a little yellow ochre upon the book, wet it with a little ſize-water, and rub it off with ſome clean ſhavings. The gilding-ſize is made with the white of an egg, mixed with water, and beat well together. The leaves being wetted with the ſize-water, with a bruſh, the gold is then laid upon it, and afterwards dried before the fire. When dried, it is burniſhed off with a dog's tooth ſet in a handle. See GILDING on *paper*, &c. Blacking the leaves is done with fine antimony, the leaves being wet, and the antimony rubbed upon them until quite dry, when it is burniſhed like the gold.

The head-band is now added, which is an ornament of thread or ſilk, of two or three colours, placed at each extreme of the book, acroſs the leaves, and woven or twiſted, ſometimes about a ſingle, and ſometimes a double piece of rolled paper, or, what is more laſting, of glued paper-thread.

For the covers; the ſkins uſed undergo ſeveral preparations, which we ſhall explain in calf, as being the leather moſt uſed; and as being that to which all the reſt with a little variation may be referred. The calf-ſkin, being moiſtened in water, is cut to the ſize of the book, and the thickneſs of the edges pared off on a marble ſtone kept for that purpoſe. The cover is next ſmeared over with paſte, made of wheat-flour; then ſtretched over the paſte-board on the out-ſide, and doubled over the edges within-ſide. They then *cord the book*, or *bind* it firmly between two boards, to make the cover ſtick the ſtronger to the paſte-boards and the back; on the exact performance of which depends a great part of the truth and neatneſs of the book. The back is then warmed at the fire to ſoften the glue, and the leather of the back is rubbed down, with a folding-ſtick or bodkin, to ſet and fix it cloſe to the back of the book. It is now ſet to dry, and when dry, uncorded: the book is then waſhed over with a little paſte and water, the edges and ſquares blacked with ink, and then ſprinkled fine with a bruſh, by ſtriking it againſt the hand, or a ſtick; or with larger ſpots mixed with vitriol, which is called *marbling*. Two blank leaves, on each ſide, are then to be paſted down to the cover, and, when dry, the leaves are *burniſhed* in the preſs, and the cover rolled on the edges.

The cover is now glazed twice with the white of an egg; it is then filleted plain, or with gold; and at laſt poliſhed with a poliſhing iron, paſſed hot over the glazed colour. If the book be required to be lettered, they paſte a piece of red Morocco on the back, between the firſt and ſecond band to receive the title in gold letters; and ſometimes a ſecond between the next bands underneath, to receive the number of the volume.

The plain binding, properly ſo called, is now complete; the gilding on the back and cover, as it makes a part of the *book-binder's* buſineſs among us (though, with the French, &c. it is a diſtinct profeſſion), we ſhall here ſubjoin.

Manner of gilding books on the back and covers. In ordinary binding, they gild little elſe but the backs, and the outward edges of the cover. On the backs are gilt the title of the book, &c. with flowers, roſes, knots, ſtars, &c. between the bands: on the covers are ſometimes added compartments, arms, &c. All theſe ornaments are made with each its ſeveral gilding tool, engraved in *relievo*; either on the points of puncheons, as thoſe of letters, roſes, ſtars, &c. or around little cylinders of braſs, as the lines, embroideries, &c. The puncheons make their impreſſion, by being preſſed flat down; and the cylinders by being rolled along by a handle, to which they are fitted on an iron ſtay, or axis.

To apply the gold, they glaze thoſe parts of the leather, whereon the tools are to be applied, three or four times with a liquor made of the whites of eggs diluted with water by means of a ſponge; and, when nearly dry, they ſlightly oil them, and then lay on pieces of leaf-gold, and on theſe apply the tools, with a careful even preſſure of the hand, or roll the cylinders, both the one and the other, reaſonably hot. If the figures be large, and require a great *relievo*, as arms, &c. they are beat or preſſed down. The gilding thus finiſhed, they rub off the ſuperfluous gold, and poliſh the whole; the gloſs of which is greatly aſſiſted by a final preſſing between horns peculiar for the purpoſe.

Our book-binders, for gilding on rough leather, make uſe of reſin dried and powdered, inſtead of whites of eggs; and the gold leaf, firſt cut to a proper ſize, is laid on a hot ſomewhat oiled ſtamp, and preſſed down: and thus the reſin melts only in thoſe parts where the hot ſtamp is applied, and the gold fixes on it, whilſt the other parts of the leather remain rough as at firſt. Dr. Lewis's Com. Phil. Tech. p. 615. See GILDING.

Ahaſ. Fritſch, chancellor of the univerſity of Jena, has a diſſertation expreſs concerning book-binders, *De Bipliopegis*; wherein he treats of the laws preſcribed by theſe artificers, and the tax or price ſettled by the magiſtrate for binding books, of every ſort in ſheep-ſkin, vellum, &c.

END OF VOL. IV.

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